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# THÈSE DE DOCTORAT

## Trois essais sur la rémunération des dirigeants et gouvernance des entreprises

Les effets et conséquences de la rémunération des dirigeants  
sur leurs entreprises

**Julien FARHAT**

INSTAR

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# Trois essais sur la rémunération des dirigeants et gouvernance des entreprises

Les effets et conséquences de la rémunération des dirigeants sur leurs entreprises

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# Trois essais sur la rémunération des dirigeants et gouvernance des entreprises

Les effets et conséquences de la rémunération des dirigeants sur leurs entreprises

## Résumé

Les grands scandales financiers du début du XXI<sup>e</sup> siècle ont mis en évidence les problèmes liés à la rémunération des dirigeants des entreprises aux États-Unis. Ces scandales, allant de la fraude comptable en passant par les options antidatées, ont suscité l'attention de la presse populaire ainsi que celle des chercheurs scientifiques (Murphy 2013, Edmans et al. 2017). Dans la présente thèse, nous analysons d'abord les impacts de la prise de risque des PDG, via leurs rémunérations, sur les décisions d'investissement. Ensuite, nous étudions le rôle de la réglementation vis-à-vis de la rémunération des dirigeants.

Dans ce premier chapitre, nous étudions la probabilité des dirigeants des entreprises américaines à faire des fusions et acquisitions (M&As) internationales jugées « trop risqués », en fonction des différentes composantes de leurs rémunérations. Dans un échantillon de 36 987 acquisitions, nous constatons que la composante Vega incite les gestionnaires à effectuer des transactions internationales plus risquées. De plus, les mécanismes de gouvernance internes des entreprises n'affectent pas cette relation. Les résultats de nos analyses montrent également, que les entreprises ayant très peu d'expériences internationales sont à l'origine de cette relation. Enfin, nous constatons que le Vega est associé à des profits plus élevés, mais ce résultat persiste exclusivement pour les entreprises qui effectuent des transactions nationales.

Dans ce second chapitre, nous examinons la base de données « Audit Analytics » (AA) qui contient des informations sur les lettres de commentaires de la SEC (Securities Exchange Commission). Nous identifions trois problèmes majeurs liés aux lettres de commentaires qui traitent le sujet de la rémunération des dirigeants des entreprises (CCL). Premièrement, nous constatons que AA ne retranscrit pas certaines informations relatives aux différentes réglementations contenues dans les lettres. Deuxièmement, nous remarquons que les données fournies par AA ne sont pas suffisamment détaillées. Troisièmement, dans certains cas, les informations relatives aux lois manquent parce que la SEC ne les cite pas dans les lettres. Avec l'aide du logiciel Python, nous complétons la base de données en identifiant les règles et les

mots clés contenues dans les lettres et non retranscrites par AA. Python nous permet d'identifier 85% du contenu non assimilé dans les CCL. Les 15 % restants, qui n'incluent pas de règles spécifiques ou de « mots clés » faisant référence à des règles, sont résolus manuellement.

Dans le chapitre 3, nous analysons à l'aide d'une nouvelle base de données unique, la probabilité de recevoir une CCL de la part de la SEC. Nous constatons que ces raisons sont liées aux caractéristiques externes et internes de rémunération des dirigeants d'entreprises. Les caractéristiques de rémunération externes sont les écarts entre la rémunération effective et prévisible compte tenu des caractéristiques des entreprises et de l'industrie. Les caractéristiques de rémunération interne correspondent aux disparités salariales au sein de la même équipe de direction. En outre, nous remarquons que plus la différence de rémunération interne et externes des dirigeants est importante, plus les entreprises reçoivent de la part de la SEC, des CCL et des commentaires. Les lettres reçues concernent la rémunération totale et soulignent les erreurs liées aux formats et contenus des tableaux requis par la SEC et aux explications des politiques de rémunération. Ensuite, nous constatons que la réception d'une CCL peut augmenter les chances de remplacement du PDG. Cependant, si le PDG occupe toujours son poste, les différences de rémunération sont revues à la baisse.

Mots-clés : Rémunération des dirigeants, fusions et acquisitions internationales, incitations à la prise de risques, lettres de commentaires de la SEC, classification de texte, gouvernance d'entreprise, PDG.

# Three essays on executive compensation and governance

The impact of executive compensation on firms' investment decisions and firms' scrutiny by regulators

## Abstract

The first decade of the new century was rocked by scandals related to executive compensation in the United States. These scandals ranging from accounting fraud to option backdating have generated significant attention in the popular press<sup>1</sup> and produced extensive research related to executive compensation practices (Murphy 2013, Edmans et al. 2017). Hence, understanding and examining the impact of compensation incentives and their various consequences on firms is crucial. This dissertation explores 1) the effect of CEOs' risk-incentives on investment decisions and 2) the role of regulations regarding executive pay.

In Chapter 1, I study the propensity for U.S CEOs to make over-risky investments through cross-border mergers and acquisitions (M&A) and the deals' repercussions on firm performance. I analyze in particular which compensation components influence CEOs decisions to target foreign firms and how they affect firm performance. In a sample of 36 987 acquisitions, I find that risk-taking incentives (captured by Vega) motivate managers to engage in international transactions. I also find that corporate governance mechanisms do not attenuate this relationship. Our results show that this relationship is driven by CEOs of firms that do not have prior international experience. Finally, we find that Vega is associated with higher CARs for firms pursuing domestic transactions.

In Chapter 2, we examine the Audit Analytics (AA) database which provides information related to SEC comment letters. A careful analysis of the AA database reveals three main issues with comment letters related to executive compensation. First, we find that the AA database overlooks some information related to SEC regulations and accounting rules contained in letters. Second, we find that data provided by AA lack accuracy. Third, we find that information is missing because the SEC does not provide full references to rules in some cases. We complete the database by extracting the rules contained in letters and omitted by AA. We also

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<sup>1</sup> "The New York Times alone printed 339 stories dealing with executive compensation in 2006" (Hawkins 2006-2007)

extract key words from comment letter texts using Python and use these to identify rules for which references are lacking. The Python programs enable us to identify 85% of the overlooked content in compensation comment letters. The remaining 15% which do not include specific rules or “key words” referring to rules are manually resolved.

In Chapter 3, we investigate the determinants of receiving a compensation comment letter (CCL) sent by the SEC to U.S firms using a unique new database. We define external compensation characteristics as the deviation from expected compensation given firm and industry characteristics. Internal compensation characteristics correspond to pay disparities within the top management team. We find that external and internal compensation characteristics increase the probability of receiving a CCL. We further show that greater external and internal divergences in executive compensation are associated with a larger number of compensation related comment letters and compensation issue phrases with the SEC. Comments received concern the compensation package as a whole, as opposed to its individual components and are related to the justification of compensation policies and practices. We also examine outcomes resulting from receipt of a CCL. We find that receipt of a CCL increases the probability of CEO turnover. Finally, we find that when the CEO is retained, changes in internal and external CEO compensation characteristics are negatively associated with the receipt of CCLs. Cross-sectional results indicate that these changes are concentrated in firms with less powerful CEOs.

Key Words: Executive compensation, Cross-Border Mergers & Acquisitions (M&As), Risk-taking incentives, M&A Deals Completion, SEC Comment Letters, Text classification, Corporate Governance, Corporate Disclosure.



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# General Introduction

The first decade of the new century was rocked by scandals related to executive compensation in the United States. These scandals ranging from accounting fraud to option backdating have generated significant attention in the popular press<sup>2</sup> and produced extensive research related to executive compensation practices (Murphy 2013, Edmans et al. 2017). Despite the disastrous economic and financial consequences, CEO pay packages kept increasing (+1322% since 1978). In 2020, CEOs of the top 350 companies in the U.S earned \$24.2 million on average, 351 times more than a typical worker<sup>3</sup>. Hence, understanding and examining the impact of compensation incentives and their various consequences on firms is crucial. This dissertation explores 1) the effect of CEOs' risk-incentives on investment decisions and 2) the role of regulations regarding executive pay.

In chapter 1, we analyze the impact of U.S CEOs risk-taking incentives on their decisions to acquire foreign targets. Unlike their shareholders, managers are undiversified since most of their financial wealth is tied up to the firm they work for (Smith and Stulz 1985). This situation may create agency problems between shareholders and management due to divergence of interests. Risk-averse managers may have incentives to reduce their personal exposure by selecting projects with lower cash flow volatility or investing in assets that will stabilize the company's revenue stream through diversification strategies. This can be detrimental for their shareholders' interests since the firm could potentially miss out on risky positive net present value projects (Belghitar and Clark 2015). In order to align managers' incentives with those of their respective shareholders, traditional corporate governance theory suggests that the optimal CEO compensation contract should link managerial compensation to firm performance or firm value (Holmstrom, 1979; Jensen and Meckling, 1976; Stulz, 1988). In other words, one possible way of reducing agency costs would be through equity-based compensation.

In the early 1990s, CEOs have been greatly compensated with fixed compensation such as base salaries and bonuses<sup>4</sup>. In addition to their salaries and bonuses, CEOs are rewarded with company stocks and stock-options. These two compensation components depend on performance measured over a single or multiple years. Since the early 2000s, the proportion of

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<sup>2</sup> "The New York Times alone printed 339 stories dealing with executive compensation in 2006" (Hawkins 2006-2007). P. 449.

<sup>3</sup> CNBC, 2021. "In 2020, top CEOs earned 351 times more than the typical worker". <https://www.cnbc.com/2021/09/15/in-2020-top-ceos-earned-351-times-more-than-the-typical-worker.html>

<sup>4</sup> Base salaries accounted for 41% of CEOs median total compensation in 1992 for S&P 500 firms (Murphy 2013, pp 15).

equity-based compensation as a percentage of total pay has been significantly increasing. In 2021, stock-based compensation accounted for 61% of CEO total pay for Equilar 500 companies<sup>5</sup>. By contrast, base salaries represented only 10% of CEO total compensation.

Every compensation component impose different amounts of risk on executives. The payoffs from stock options are riskier than the ones from restricted stocks, which in turn are riskier than base salaries (Murphy 2013). The incentives provided by the different compensation components have been examined in the literature. Several variables have been used in the literature in order to account for CEO incentives such as the number of stocks or options held or granted, the value of options granted, stock grants, stock and option portfolios. However, Coles et al. (2006) argue that these measures are at best noisy proxies and that more precise measures should be used. The authors rely on two variables: Delta and Vega. The first is defined as “the change in dollar value of the CEO wealth for a one percentage point change in stock price at the end of the fiscal year”. The second is “the change in dollar value of the CEO wealth for a one percentage change in the annualized standard deviation of stock returns at the end of the fiscal year”. The authors and other papers (Belghitar et al. 2015) find that Delta provides managers with incentives to work harder and more effectively, which aligns their incentives with the ones of their shareholders. However, other studies find that Delta is associated with managerial risk aversion, as under-diversified managers are exposed to the firm’s total risk (Chava and Purnanandam 2010). Thus, these CEOs would prefer to disregard risky positive net present value projects and turn to low-risk corporate investments. In order to counter risk aversion, shareholders tend to increase the convexity of the relationship between managerial wealth and firm performance by offering them option-based compensation proxied by vega (Guay, 1999). Studies document higher values of vega motivate CEOs to take more risky investment-decisions that would potentially generate higher significant gains (Coles et al. 2006, Beladi and Quijano 2013). However, the attribution of option-based compensation could motivate managers to take excessive risks leading to significant losses for shareholders (Sanders and Hambrick 2007).

Papers investigating CEO compensation and incentives in the context of mergers and acquisitions (M&As) document mixed results. Datta et al. (2001) examine U.S firms and find a positive association between equity-based compensation and short and long-run returns. The authors show that firms managed by CEOs with low equity-based compensation underperform as they are less incentivized to increase firm value. By contrast, Croci and Petmezas (2015)

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<sup>5</sup> Meridian compensation partners, 2022. “CEO Pay Trends”, <https://www.meridiancp.com/insights/equilar-ceo-pay-trends-july-2022/>

examine the impact of risk-taking incentives on acquisition investments. The authors find that risk-taking incentives proxied by delta and vega induce CEOs to undertake risky acquisitions. Ruiz and Renneboog (2017) find that excess compensation is associated with negative stock valuation at a takeover announcement. Chen et al. (2018) find that CEOs with high inside debt are more likely to engage in vertical mergers which generate lower returns for shareholders. However, none of these studies distinguish between domestic and cross-border transactions despite the significant differences between the two. While international M&As can present real benefits through corporate diversification (Dos Santos et al. 2008), these transactions include much more complex characteristics. These features involve differences in cultural and corporate governance norms, political and economic environments, information disclosure and quality of accounting and bilateral trade relationships between countries (Erel et al. 2012). These disparities can lead to value destruction (Christophe 1997, Denis et al. 2002) and lower announcement returns than domestic transactions (Moeller and Schlingemann 2005; Conn et al. 2005). Therefore, testing the association between CEO incentives and M&As in the context of cross-border transactions seems to be interesting.

We fill this gap by analyzing an M&A sample composed of U.S public acquirers pursuing domestic and/or cross-border transactions between 1996 and 2019. The results show a positive and significant association between CEOs risk-taking incentives (proxied by vega) and the probability of acquiring a non-US target. We also find that corporate governance mechanisms do not affect the previous relationship, consistent with Croci and Petmezas (2015). This relationship is driven by CEOs managing firms with low international experience. Finally, we find that CEO vega is positively related to the bidder 5-day announcement returns. However, this relationship is driven by domestic transactions exclusively.

In Chapters 2 and 3, we examine the role played by the SEC in regulating the level of pay of executives. In 2006, the SEC voted to adopt new rules requiring companies to disclose information regarding executive pay packages in their annual proxy statements. This produced 20 000 comment letters received by the SEC in response to its proposals. This change in rules was adopted for several reasons. First, the previous compensation rules did not provide investors with accurate and complete information despite the substantial changes experienced by compensation packages awarded to directors and executives (Cox 2006). Another reason relates to the option-backdating scandal and the significant payouts and severance packages attributed to executives. Under this practice, firms falsified the grant date of executives' stock options. Companies reported options as granted at the money (the exercise price is equal to the market price on the grant date), where options should have been reported as granted in the

money (when the exercise price is well below the market price on the grant date). Since then, the number of compensation-related comment letters (CCL) has significantly increased, reaching a peak in 2010 (Ryans 2021).

CCLs include comments from the SEC on firms' compensation disclosures. These comments usually include specific regulations or accounting standards that enable companies to better understand the SEC's requirements. Despite the volume of comment-letter related research (Robinson et al. 2011, Laksmana et al. (2012), Chen et al. 2020, Yang 2021, Wang et al 2022), studies analyze only a specific part of these regulations or focus their attention on specific sections, such as the compensation discussion and analysis (CD&A). We fill this gap in chapter two by detailing the construction of a novel dataset containing the complete set of rules related to SEC regulations and accounting standards. We use the Audit Analytics (AA) database containing SEC comment letters as our starting point. The dataset contains the letters sent from the SEC to firms (UPLOAD), companies' responses (CORRESP) and a comment letter conversation id (COMMENT LETTER CONVERSATION ID) that incorporate comment letters (UPLOAD) and firms' responses (CORRESP) that relate to a single review. Another important feature of AA is that it provides data related to firm characteristics, other letter-related information and a firm identifier (CIK) that enables us to link CCL data to other data sources. Importantly, the dataset contains specific rules (issue phrases) that the SEC refers to during the review process. The analysis of these regulations is key to fully understand what the SEC is concerned about regarding executive compensation disclosures. After exhaustive examinations of CCLs and AA, we find that the information provided by the database is incomplete for three reasons. First, some information contained in CCLs are overlooked by AA, and thus not displayed in the database. Second, in some cases, the rules provided by AA lack accuracy. Third, in other cases, the information is missing because the SEC does not provide full references to rules. The incompleteness of AA in terms of rules does not enable papers to examine the complete set of compensation-related rules that the SEC refers to in CCLs. The objective of our second chapter is to propose a solution to these issues by developing a methodology that extracts more complete information.

We detail the necessary steps to build a dataset containing the complete set of executive compensation rules that the SEC refers to in letters. In order to that, we create two programs using Python. The first consists of extracting all the rules related to SEC regulations and accounting standards, that the SEC mentions in CCLs when commenting on compensation disclosures. This step enables us to solve the first two AA shortcomings. The second program involves extracting keywords related to rules for which references are lacking. This

computerized content analysis is necessary to analyze letters that do not mention explicit rules yet addresses specific comments and instructions to firms.

The programs created allow us to identify 85% of the overlooked content in CCLs. The 15% remaining which do not include specific rules or keywords referring to rules, are resolved using manual content analysis. Our dataset is composed of rules related to SEC regulations in 70% of the cases and accounting standards in 30% of the cases. However, unique issue phrases related to accounting standards (SEC regulations) account for 65% (35%) of the total number of unique issue phrases. Our results indicate that SEC targets firms in the manufacturing industry (32%), followed by Finance and Insurance (15%) and information (10%) industries. Another important feature of the database is the ability to suggest new classification of regulations that can be useful for future research. Previous papers examining CCLs have only focused on SEC regulations and relied on basic categories related to pay-performance disclosures, governance disclosures and readability-related comments (Robinson et al. 2011; Wang et al. 2022). We construct our categories by referring to rules' definitions contained in SEC press releases, taking examples from comment letters and reading academic papers and reports from legal and accounting firms. We construct three types of categories. The first category contains concerns the main compensation components of executives following Murphy (2013) and Edmans et al. (2017). The second category relates to the tables required by the SEC for compensation disclosures. This category enables us to expand the contents of the first category. We also construct a third category related to the informational functions of the letters. In other words, we classify regulations in sub-categories considering the format, presentation and content of tables, the methodologies employed by firms for measurement, recognition and valuation purposes and finally the justification of compensation policies and/or decisions made related to executive compensation. These three types of categories offer new insights concerning SEC rules and new possibilities for future research.

Our classifications show that 48% of issue phrases are related to the total compensation package offered to CEOs, whereas 43% are linked to stock awards and stock options exclusively. We also find that three informational functions (format/standardization 90%, content 72% and justification 89%) are mostly related to SEC regulations, whereas methodology (77%) is mostly related to accounting standards.

The creation of this dataset enables us to tackle research questions related to CCLs in the most profound way. In particular, despite the few studies related to CCLs, little is known about why firms receive compensation-related comment letters and which companies are targeted by the SEC using these letters. The purpose of our third chapter is to address this gap in the



literature by examining the determinants of receiving a compensation comment letter (CCL). We also analyze CCL characteristics and investigate the subsequent changes in executive compensation characteristics.

Several studies have examined the determinants of receiving a general SEC comment letter (Johnston and Petacchi 2012, Cassel et al. 2013, Heese et al. 2017). These papers have identified several factors affecting the SEC's decision to target companies. The authors refer to the SOX section 408 paragraph (b) that states that the SEC shall consider among other factors, material restatements of financial results, levels of volatility, firms' market capitalization and price-to-earnings ratios. Papers also refer to other firms' characteristics (such as profitability, company complexity) and governance characteristics (such as CEO/Chairman duality, independent directors). However, only one study investigates factors related to executive compensation characteristics, which could be interesting in the context of CCLs (Robinson et al. 2011). Compensation characteristics can be external or internal. We define external compensation characteristics as deviations from expected compensation given firm and industry characteristics. Internal compensation characteristics concern compensation divergences within the top management team. Robinson et al. (2011) examine a sample composed exclusively of 336 companies that received comments from the SEC in 2007. They refer only to one external compensation characteristic, namely CEO excess compensation and find a positive association with the number of compensation-related comments received by firms. The purpose of our paper is to analyze the association between the receipt of CCLs on one hand and external and internal compensation characteristics on the other hand. In order to do that, we examine a sample composed of COMPUSTAT firms that received or did not receive a comment letter between 2004 and 2020. We also consider several internal compensation measures used in the literature such as CEO pay gap (difference between the CEO's total compensation and the mean compensation of the next four best paid executives, Henderson and Fredrickson 2001), CEO pay slice (the proportion of the top-five top management team (TMT) members' compensation captured by the CEO, Bebchuk et al. 2011) and TMT pay disparity (standard deviation of total pay of TMT members divided by the average of their total pay, Fredrickson et al., 2010; Siegel and Hambrick, 2005; Lim 2019). Regarding external compensation variables, we complement the study of Robinson et al. (2011) by computing additional variables. We follow the methodology of Core et al. (2008) and estimate excess CEO pay gap, excess CEO pay slice and excess TMT pay disparity.

The results of our analysis document a positive and significant association between internal/external compensation characteristics and the probability of receiving a compensation

comment letter. This suggests that the SEC is not only interested in firms managed by over-compensated CEOs relatively to their peers, but also to dominant CEOs within their firms. We also find that external and internal executive compensation disparities lead to the receipt of additional letters and issue phrases related to SEC regulations. These firms take more time to resolve the comments received by the SEC. Regarding issue phrases received, we find that they concern the compensation package as a whole, as opposed to individual components. We also discover that they are related to the “summary compensation table” which is one of the required SEC table, displaying information regarding total compensation of the named executive officers in the firm. Finally, comments received by the SEC are associated to the content and format of the required SEC tables and to the justification of compensation policies and practices in the firm.

We also investigate the impact of CCLs on the subsequent changes in executive compensation and CEO characteristics. Precisely, we find a negative association between the receipt of a CCL and changes in internal and external executive compensation characteristics, in line with Wang et al. (2022). Cross-sectional results indicate that this negative change concerns less powerful CEOs. Our results also indicate that the receipt of a CCL increases CEO turnover, in line with Cheng et al. 2014).

Overall, this research has several contributions to the executive compensation literature. First, it provides new insights on risk-taking incentives and M&A transactions. Despite the extensive research linking risk-taking incentives (proxied by vega) and M&As, no paper has explored this association in the context of cross-border transactions.

Second, we contribute to the SEC comment letter literature focusing on CCLs in the following aspects. We provide the detailed steps leading to the creation of a unique dataset containing the complete set of rules related to SEC regulations and accounting standards. To our knowledge, papers examining CCLs focus only on a specific part of SEC rules (Robinson et al. 2011, Chen et al. 2020, Wang et al 2022), especially the compensation discussion and analysis section (Lakshmana et al. 2012, Yang 2021). Our novel dataset will enable future research to investigate the full set of rules mentioned by the SEC in CCLs.

Third, despite the various studies examining the determinants of receipt of comment letters, no paper explores factors related to executive compensation. Also, papers linking executive compensation to CCLs have only focused on one external compensation characteristics: CEO excess compensation. In our third paper, we shed light on the role played by internal compensation characteristics on the propensity of receiving a CCL. Finally, we complement

external compensation characteristics by computing new excess variables (excess CEO pay gap, excess CEO pay slice and excess TMT pay disparity).

# Chapter 1

## Do risk-taking incentives motivate U.S CEOs to acquire foreign targets?

I study the propensity for U.S CEOs to make over-risky investments through cross-border mergers and acquisitions (M&A) and the deals' repercussions on firm performance. I analyze in particular which compensation components influence CEOs decisions to target foreign firms and how they affect firm performance. I use the Delta and Vega of CEOs of U.S firms to capture executives' incentives. In a sample of 36 987 acquisitions, I find that risk-taking incentives (Vega) motivate managers to engage in international transactions. I also find that corporate governance mechanisms do not attenuate the relationship between Vega and cross-border M&As. Our results show that this relationship is driven by CEOs of firms that do not have prior international experience. Finally, we find that Vega is associated with higher CARs for firms which pursue domestic transactions. Overall, our results confirm that risk-taking incentives motivate CEOs of U.S firms to acquire foreign targets.

## 1.1 Introduction

The empirical work of Coles et al. (2006), Dong et al. (2010) and Gormley et al. (2013) predicts a positive relationship between option-based compensation and risk-taking. In the context of mergers and acquisitions (M&As), several studies such as Hagendorff and Vallascas (2011), Croci and Petmezas (2015), Chen, Officer and Shen (2018) find that risk-taking incentives provided to CEOs induce them to invest in mergers and acquisitions transactions. While the vast literature examining this relationship is ample for domestic M&As, we have by comparison very few papers analyzing it in the context of international transactions. However, cross-border transactions reached an all-time high value of \$2.1tn in 2021, up by 69% from a year earlier<sup>6</sup>. Motivated by the lack of knowledge in this context, this study examines whether CEOs risk-taking incentives motivate managers to engage in “over-risky” investments such as cross-border M&A deals. Precisely, we focus on CEOs of U.S corporations acquiring domestic and foreign targets during the period going from 1996 until 2019 for various reasons. First, The United States attracts a particular interest since it has been the leader of acquiring firm countries worldwide since the early two-thousands<sup>7</sup>. Second, the acquisitions of foreign companies have been rising since 1996, reaching a record of 321\$ billion in 2018. Finally, we are able to collect a significant amount of data regarding U.S corporations as well as their CEOs using WRDS databases as well as SDC Platinum.

Using cross-border M&As to study the impact of managerial compensation on investment policy is interesting for several reasons. First, corporate takeovers represent the ideal testing platform to analyze the relationship between CEO risk-taking incentives and investment decisions (Jensen 1986). Second, while M&As are considered as risky investments, cross border deals can represent far more riskier deals for the shareholders of the acquiring firm when compared to domestic ones. While firms tend to acquire abroad in order to diversify their operations<sup>8</sup> (Koerniadi et al. 2015), cross-border acquisitions present greater challenges for the acquirer specially because of institutional, political and cultural differences with the foreign corporation. The greater level of uncertainty related to cross-border acquisitions imply significant risks for the shareholders of the acquiring firm.

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<sup>6</sup> FDI intelligence (2022). <https://www.fdiintelligence.com/content/data-trends/cross-border-ma-reaches-alltime-high-of-21tn-in-2021-80599>.

<sup>7</sup> Ernst Young LLP analysis (2019).

<sup>8</sup> But also, to gain additional resources and skills that are not available on the domestic market, have cheaper material on labour costs, benefit from tax advantages, or even enhance production efficiencies (En Xie et al. (2016))

Our study draws motivation from the lack of studies linking managerial risk-taking incentives and over-risky investments in the context of international acquisitions. We analyze the role of option-based compensation (vega) and stock-based incentives (delta) in the context of cross-border M&As. We use a sample of M&As conducted by U.S public firms from 1996 to 2019 and find a positively significant association at the 5% level between vega and cross-border deals. In terms of economic significance, a one-unit increase in vega boosts the probability of acquiring foreign targets by approximately 6.41%. This is consistent with the idea that risk-taking incentives may lead to over-risky investment. In order to attenuate endogeneity concerns we run two-stage least squares (2SLS) following Ferrel, Liang and Renneboog (2016). Our results document a positive association between vega and cross-border acquisitions underlining the robustness of our main result.

We also test the impact of governance mechanisms on the relationship between vega and the probability of acquiring outside of the US. We find that the coefficient of vega remains significant and positive. Furthermore, the interactions between vega and the governance variables (independent directors, dual class shares, CEO/Chairman duality and board size) do not seem to have an impact on the main relationship. We also examine the impact of the firm's prior international experience on our result. We find that our results are driven by firms that do not have prior international experience. Finally, we analyze the relationship between CEO risk-taking incentives (vega) and acquisition quality around the announcement. Consistent with related studies (e.g., Croci and Petmezas), we find that CEO vega is positively related to the bidder 5-day announcement returns. However, this relationship is driven by domestic transactions exclusively.

This study has interesting contributions to the risk-taking incentives as well as the M&A-executive compensation literature. First, to our knowledge this is the first study to explore the relationship between U.S CEO Vega and the propensity to acquire foreign targets. We estimate and use Vega and Delta in the analysis to account for CEO incentives, as they represent more precise CEO measures of incentives than other “noisy proxies such as the number or the value of options or stock held or granted” (Coles et al. 2006). By incorporating both Vega and Delta in our analysis, we are able to isolate the effect of each of these incentives on the probability of going abroad and conducting over-risky investments. Our results clearly show that the over-risky investment decision is significantly driven by Vega rather than Delta. We alleviate endogeneity concerns by using a two-stage least squares (2SLS). Second, our results show that this significant positive relationship is not affected by prior international experience. In our sample, CEO Vega is positive and statistically significant for firms that do not have prior

international M&A experience. Third, we provide evidence that corporate governance mechanisms do not attenuate the impact of Vega on the probability of engaging in cross-border deals. Board independence, board size, CEO/Chairman duality and dual class shares structure (DCS) do not discourage U.S CEOs of pursuing foreign transactions. Finally, we contribute to the literature on the relationship between CEO compensation and bidder firm shareholder value creation by showing that CEO risk-taking incentives increase bidder shareholders' wealth. However, the result is driven by U.S firms pursuing domestic acquisitions deals only.

Our study is related to the work of Datta et al. (2001), Coles et al. (2006), Matta and Beamish (2008), Ozkan (2012), Croci and Petmezas (2015), Ruiz and Renneboog (2017) and Choi et al. (2020). While Coles et al. (2006) analyze the impact of CEO risk-taking incentives on R&D investments and small businesses, Croci and Petmezas (2015) and Chen et al. (2018) examine the effect of these incentives on M&A decisions. In our paper, we attempt to study the propensity for U.S CEOs to make "over-risky" investments by including both domestic and cross-border mergers and acquisitions conducted by U.S public firms. Ozkan (2012) and Choi et al. (2020) examine the relationship between executive compensation and foreign acquisitions but *after* acquisitions. Datta et al. (2001) and Ruiz and Renneboog (2017) analyze the effect of executive equity-based compensation on bidder announcement returns and find a positive relation. We isolate the effects of vega and delta and find a similar relationship. However, the result is driven by firms pursuing domestic M&A deals. Finally, our study is related to Matta and Beamish (2008) who examine the career horizon problem of CEOs approaching retirement and find that younger CEOs tend to be more risk-taking and engage in cross-border transactions.

The rest of the paper is organized as follows. Section 1.2 presents the literature and develops hypotheses. Section 1.3 describes the data, the sample used and empirical methodology. Section 1.4 present our empirical results. Finally, Section 1.5 concludes.

## **1.2 Literature Review and Hypotheses development**

### *1.2.1 CEO compensation*

Unlike firms' shareholders, managers are undiversified since their wealth depend largely on the company they work in (Smith and Stulz 1985). This can lead to a divergence of interests between shareholders and managers since the latter would become more risk averse. Traditional corporate governance theory suggests that the optimal CEO compensation contract should link managerial compensation to firm performance (Holmstrom, 1979; Jensen and

Meckling, 1976; Stulz, 1988) in order to align their incentives with those of their respective shareholders (neo-classical economic theory). Datta et al. (2001) find a significantly positive association between managerial equity-based compensation and firms' announcement returns and long run stock performance. This induces greater effort from the agents (managers) yet increase the risk on their compensation. Two precise measures have been cited in the literature to account for managerial incentives. The first measure is the Delta, defined as the sensitivity of CEO wealth to stock price. Coles et al. (2006) find that Delta plays a significant role in aligning the interests of CEOs with their respective shareholders. However, Delta can also be associated with risk aversion as it imposes a cost on management (Chava et al. Purnanandam, 2010). As their wealth is tied to their firm, CEOs may favor low risk corporate policies and disregard risky positive net present value (NPV) projects. In order to counter risk-aversion, shareholders tend to increase the convexity of the relationship between managerial wealth and firm performance by offering CEOs option-based compensation (Guay, 1999). This leads to the second measure of managerial incentives: the vega. It is defined as the sensitivity of CEO wealth to firm stock return volatility. This measure should induce CEOs to take more risky investment-decisions that would potentially generate higher significant gains. However, the attribution of option-based compensation could motivate managers to take excessive risks leading to significant losses for shareholders.<sup>9</sup> Overall, these papers suggest that while CEOs are given risk-taking incentives to invest in risk-increasing projects, these incentives may motivate them to take on over-risky value-destroying investment projects.

### *1.2.2 Mergers and acquisitions and CEO compensation*

Two main issues arise when examining the association between acquisitions and executive compensation. The first is related to whether acquisitions affect CEOs' compensation packages, whereas the second concerns the impact of executive compensation on acquisition decisions. We focus on the latter because the former has been well documented in the literature (Shleifer and Vishy 1988; Grinstein and Hribar 2004; Harford and Li 2007; Guest 2009; Choi et al. 2020).

Hagendorff and Vallascas (2010) examine the impact of executive compensation on risk choices undertaken by bank CEOs. The authors find that CEOs with higher risk-taking incentives tend to engage in risky mergers in the banking sector. Croci and Petmezas (2015)

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<sup>9</sup> Sanders and Hambrick (2007) who analyse the effect of stock options held by executives on the performance of 950 companies between 1993 and 2000, find that shareholders' returns were extreme (very positive or very negative), and that in the chosen sample the results were mostly negative.



examine the impact of risk-taking incentives on acquisition investments. The authors find that risk-taking incentives proxied by delta and vega induce CEOs to undertake risky acquisitions. However, the paper does not distinguish between domestic and cross-border deals. Fidrmuc and Xia (2017) examine target managers' motivations for offering their firms for sale and highlight the motivational role of equity grants. They find that higher golden parachutes, stocks and stock option grants motivate CEOs to initiate the sale of their companies. Chen et al. (2018) use executives inside leverage to proxy for incentives of risk-averse managers. They find that CEOs with high inside debt are more likely to engage in vertical mergers which generate lower returns for shareholders. Apart from Hagedorff and Vallascas (2010) and Croci and Petmezas (2015), other studies investigating the association between risk-taking incentives and M&As use measures for CEOs' incentives that are at the very best "noisy proxies such as the number or the value of options or stock held or granted" (Coles et al. 2006). In our study, we examine whether risk-taking incentives proxied by delta and vega, motivate U.S CEOs to pursue cross-border acquisitions rather than domestic ones.

### *1.2.3 Domestic acquisitions vs international acquisitions*

The M&A literature mainly focuses on domestic deals when examining executive compensation (Guest 2009). However, domestic and cross-border transactions are not homogeneous for several reasons.

International transactions can present real benefits for acquiring firms through corporate international diversification (Dos Santos et al. 2008). Moreover, acquiring abroad can provide the firm with valuable opportunities such as improved technology, risk management and favorable government policies (Stulz 1981). Earlier studies document a significantly positive association between internationalization and firm value (Kim and Lyn 1986, Morck and Yeung 1991). More recently, Koerniadi et al. (2015) find that cross-border deals decrease the level of default risk for the acquiring company.

However, the vast majority of studies examining cross-border transactions consider them as risky transactions compared to domestic deals for various reasons. International transactions include much more complex issues such as differences in cultural and corporate governance norms, political and economic environments, information disclosure and quality of accounting and bilateral trade relationships between countries (Erel et al. 2012). Also, international operations can lead to value destruction (Christophe 1997, Denis et al. 2002). Moeller and Schlingemann (2005) analyze a sample of US acquiring firms pursuing foreign targets. They find that companies targeting foreign targets experience significantly lower announcement

stock returns of 1% and lower changes in operating performance compared to domestic targets. Moreover, Conn et al. (2005) examine UK acquisitions between 1984 and 1998 and find that the acquisition of domestic targets results in significantly negative return of 22% whereas the acquisition of foreign targets results in significantly negative return of 32% in the three years after merger announcement. These findings related to executive compensation and domestic and cross-border M&As lead to our first hypothesis:

*Hypothesis 1: Risk-taking incentives increase the probability of pursuing foreign M&As.*

### *1.2.3 Corporate Governance*

In addition to external mechanisms<sup>10</sup>, corporate governance characteristics can play a significant role in affecting firms' decisions to pursue M&A transactions (Bauguess and Stegemoller 2008). Strong internal corporate governance mechanisms can prevent managers from investing in projects that are detrimental for shareholders' interests (Bugeja et al. 2012). The board of directors has two broad functions: monitoring and advisory (Jensen 1993). The first function concerns the board's duty to incentivize managers to act in the best interests of their shareholders and to keep track of firm performance. The advisory role consists of assisting managers in creating and implementing efficient strategies to maximize shareholder value (Aktas et al. 2016). These two roles become even more critical in major corporate events such as takeovers. Precisely, during takeover events, boards may have to manage conflict of interests between executives and shareholders. Grinstein and Hribar (2004) document a significantly positive association between managers' cash bonuses and M&A deal completion, especially when internal governance mechanisms are weak. Harford and Li (2007) find that total CEO compensation of acquiring firms becomes insensitive to negative stock performance in the presence of weak board monitoring.

The effectiveness of boards in controlling managers depends on the proportion of independent directors on the board. The presence of independent board members is significant as they have minimal economic ties with their firms, which makes them objective and effective monitors. Studies examine the impact of boards on firms' performance find mixed results. While Byrd and Hickman (1992) find a positive association between acquirer board independence and acquirer announcement returns, Masulis et al. (2007) fail to find any significant effect using independent directors and board size. Fracassi and Tate (2012) find that

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<sup>10</sup> Takeover market, pressure from financial market participants, product market competition, labor market, regulatory environment (Aktas et al. 2016).

powerful CEOs appoint directors with whom they have social ties, which leads to lower market valuation and value destroying acquisitions.

Regarding the relationship between risk-taking incentives and governance, Dicks (2012) finds that governance and incentive compensation are substitutes in decreasing agency costs. Moreover, Hagendorff and Vallascas (2010) and Croci and Petmezas (2015) find that internal corporate governance mechanisms do not affect the association linking risk-taking incentives and acquisition investments. These findings lead to our second hypothesis:

*Hypothesis 2: Internal governance mechanisms do not attenuate the relationship between risk-taking incentives and cross-border acquisitions.*

In addition to board independence, we include other governance variables well documented in the literature. Reduced boards in companies can be seen as effective tools to monitor CEOs. Lipton and Lorsch (1992) find that boards become less effective with a larger number of board members. Another important governance variable concerns CEO/chairman duality. The combined CEO and board chair position provides managers with significant influence and authority over the board (Cheng et al. 2014). In order to account for managerial entrenchment, studies have used an entrenchment index based on six anti-takeover provisions (Bebchuk et al. 2009). Managerial power theory states that managers eventually become entrenched, especially when directors are weak and ineffective, and extract rent for personal gains (Bebchuk and Fried 2003). Masulis et al. (2009) find that managers of dual class structure firms receive a higher pay than those in firms with single class shares.

#### *1.2.4 Prior international experience*

Before deciding to access a foreign market, companies face several challenges such as differences in cultural and corporate governance norms, political and economic environments, information disclosure and quality of accounting and bilateral trade relationships between countries. Thus, prior international experience can be perceived as a considerable advantage for firms willing to explore international markets. That is, firms with significant knowledge of doing business in foreign markets, will avoid mistakes and make adequate decisions in relation to future foreign business expansions (Davidson 1980, Johanson & Valne 1977). Furthermore, experienced companies will use their extensive foreign market knowledge to develop and implement mechanisms that will reduce the increased costs associated with internationalization (Haleblain & Finkelstein 1999, Barkema & Vermeulen 1998). A concrete example is Marks &

Spencer (M&S) that learned valuable lessons from unsuccessful overseas experience in the 1980s and 1990s before successfully expanding into China in 2007<sup>11</sup>. In sum, these findings imply that firms with low international experience face greater challenges relatively to those with prior foreign involvement. This leads to our third hypothesis:

*Hypothesis 3: Firms managed by CEOs with high risk-incentives (i.e., high vega) pursue cross-border M&As despite low international experience.*

### *1.2.5 Risk-taking incentives and firm performance*

The existing literature has highlighted the crucial role played by managers in shaping companies' performance. Datta et al. (2001) and Tehranian et al. (1987) document a positive relationship between incentive-based compensation and acquiring firm announcement stock returns. Croci and Petmezas (2015) find a positive and significant coefficient for vega when examining the impact of risk-incentives on the acquiring firm's returns. However, risk-taking incentives provided to managers can also lead to value-destroying acquisitions. Moeller et al. (2004) find that U.S public acquisitions are associated on average with negative acquiring firm announcement returns. In our paper, since foreign transactions are considered as riskier than domestic ones, we expect to have a positive (negative) association between risk-taking incentives and announcement returns if the firm decides to pursue domestic (risky cross-border) deals (following Moeller and Schlingemann 2005 and Conn et al. 2005)

*Hypothesis 4: Risk-taking incentives lead to positive announcement returns for domestic transactions only.*

## **1.3. Data, sample used and empirical methodology**

### *1.3.1 Data and research methodology*

Our sample consists of U.S public firms having acquired domestically and/or abroad during the period going from 1996 to 2019<sup>12</sup>. We collect M&A transactions and information related to the deals from Security Data Corporations (SDC) Mergers and Corporate Transaction

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<sup>11</sup> "...we made some mistakes before [in our global expansions] but you wouldn't be a successful business if you didn't ..." (M&S CEO), [https://moodle2.units.it/pluginfile.php/246001/mod\\_resource/content/0/BORTOLUZZI\\_MKT\\_INT.pdf](https://moodle2.units.it/pluginfile.php/246001/mod_resource/content/0/BORTOLUZZI_MKT_INT.pdf), Page 8.

<sup>12</sup> We are constrained to begin our sample in 1996 because data on directors (using Riskmetrics) are only available as of this year.

database. In order to have a “large sample”, we use the least possible restrictions. Our sample selection is based on the following steps:

Step 1: All *announced* acquisitions from 01/01/1996 to 12/31/2019.

Step 2: Disclosed and Undisclosed deal value Mergers and Acquisitions.

Step 3: The acquirer is a U.S public firm.

Step 4: The acquirer owns less than 50% prior to the announcement.

Step 5: The acquirer owns at least 51% of the target’s equity *if the transaction is completed*.

Our final requirement consists of having firms that are jointly listed on COMPUSTAT annual industrial files, Execucomp database and the CRSP files from 1996 through 2019. Our sample is composed of 2 856 firms for a total of 36 987 acquisitions. We follow Netter et al. (2011) and use a “large sample” more representative of M&As in general because “conclusions from unrepresentative samples do not hold for M&As in general”<sup>13</sup>. In order to do that, we apply the least possible filters. Our sample is composed of 28 781 (77%) domestic and 8 206 (23%) cross-border M&As. We compare our paper to papers using “large M&A samples” (Appendix A2). We find that the proportion of cross-border deal in our sample (23%) is comparable to Erel et al. (2012) (30%) and Ellis et al. (2011) (22%). Table 1 details the steps followed for the construction of our sample.

[insert Table 1 about here]

Concerning cross-border transactions, we find that in 54% of the cases U.S acquirers engage in M&A transactions with European firms, followed by North American (15%) and Asian companies (18%). The remaining announced deals are with firms from South America (7%), Oceania (6%) and finally Africa (1%). These statistics are consistent with Kiymaz (2009) and are reported in figure 1. We also break down foreign deals by target countries and find that the United Kingdom is the preferred destination for U.S acquirers with 1438 deals, followed by Canada (980), Germany (701), France (430) and Australia (401)<sup>14</sup> (figure 2). We also account for the riskiness of destination countries using the international country risk guide (ICRG 2019). This dataset includes variables related to political, financial and economic risk related to countries throughout the years. The scores attributed to countries are comprised between 0 (extremely risky) to 100 (extremely safe). For each cross-border transaction in a given year, we compare the score of the U.S to the one of the countries of destination in order to know

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<sup>13</sup> We construct a table containing related studies (Appendix A1).

<sup>14</sup> Consistent with Ismailescu et al. (2022).

which country presents the higher risks. Our results indicate that in 56% of the cases, it is riskier to pursue international deals for U.S acquiring firms. This ratio increases to 60% when we exclude North American countries. Moreover, we find that on average, safer destinations for U.S acquiring firms are Europe (48% of the cases), Oceania (77% of the cases) and North America (70% of the cases). Our results also show that riskier destinations include countries from Asia (90% riskier), Africa (99% riskier) and South America (99% riskier). Our results are consistent with the findings of Kiyamaz (2009)<sup>15</sup>, Moeller and Schlingemann (2005) and Conn et al. (2005) stating that cross-border transactions are riskier than domestic deals.

### *1.3.2 Variables and summary statistics*

In Table 2, we present the summary statistics for the variables used in our study. Regarding executive compensation measures (Panel A), we choose to use the delta and vega of CEOs of acquiring U.S public firms. The estimation of vega and delta for the manager's entire portfolio leads to a more precise CEO measure of incentives than relying on potentially noisy proxies such as the number or the value of options or stock held or granted (Coles et al. 2006; Croci and Petmezas 2015). Hence, we follow Coles et al. (2013) for the computation of CEO delta and CEO vega. Vega is estimated and defined as the change in the dollar value of the CEO wealth for a 1% change in the annualized standard deviation of stock returns, while delta represent the change in CEO wealth for a 1% change in stock price. Following Edmans, Gabaix and Landier (2009), we scale our incentive measures by total annual compensation (Execucomp variable TDC1) in order to have incentives that are independent of firm size.<sup>16</sup> These incentive measures were computed using CEO compensation data obtained from Execucomp database. We make sure to winsorize all non-binary variables at the 1<sup>st</sup> and 99<sup>th</sup> percentiles.

Delta and vega depend on the wealth accumulated by a given CEO over time in forms of stock and stock option grants. The mean (median) vega is approximately US\$ 196 000 (US\$67 000) and the mean (median) delta is approximately US\$ 1 304 000 (US\$ 326 000). We compare these values to those reported by Croci and Petmezas (2015) and find that they are

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<sup>15</sup> Kiyamaz (2009) find that U.S bidders experience wealth gains in transactions involving European targets.

<sup>16</sup> This is equivalent to multiplying Coles et al. (2013) delta measure by 100 and scaling it by total annual compensation (Execucomp variable TDC1).

comparable.<sup>17</sup> Furthermore, we compare our scaled values of vega and delta with Feng and Rao (2018) and Liu and Mauer (2011) and find that the values are very close as well<sup>18</sup>.

We also control for various factors that have been found in the prior literature to affect risk-taking and the probability of conducting cross-border deals, including individual characteristics of CEOs, firm characteristics and industry classification. In order to control for firm size, we use the log of sales<sup>19</sup> (Sanders, 2001). Harford (1999) and Faccio and Masulis (2005) have found that bigger firms have more resources and make more foreign acquisitions than smaller ones. In addition, it can be argued that larger firms have more agency conflicts, as their CEOs are further separated from their shareholders, enabling them to pursue deals that are beneficial for themselves at the expense of their shareholders (Moeller et al. 2004), therefore increasing the risk of acquiring firms. Debt ratio represents the ratio of firm total financial debt divided by the total book value of total assets at the end of the fiscal year. It has been shown in the literature that debt has an impact on the propensity to acquire by enabling or constraining the ability to commit resources for investments (Iyer and Miller, 2008). While Faccio and Masulis (2005) find a positive relationship between debt and the probability of acquiring, Uysal (2011) finds that firms with significant leverage are less likely to pursue acquisitions, one of the reasons being the increase in default risk (and Koerniadi et al. 2015). Book-to-market is defined as the ratio of a firm's book value of equity divided by the market value of equity at the end of the year *t* from COMPUSTAT. Shleifer and Vishny (2003) find that firms that have overvalued stocks carry out more acquisitions. Cash reserves is defined as firm cash and short-term investments divided by the book value of total assets at the end of the fiscal year. Firms with more cash reserves are more likely to engage in acquisitions (Jensen 1986). We use Tobin's *Q* as a proxy for prior firm performance. It is defined as the firm's market value of equity scaled by the book value of total assets at the end of the fiscal year. Benartzi and Thaler (1999) find that a firm's prior performance is a referent for decision makers' evaluation of risky choices. We control for the acquirer's prior international experience by computing the foreign sales ratio using COMPUSTAT segments (Matta and Beamish 2008). We control for the firm's total risk as it affects the relative riskiness of an international acquisition. We follow Matta and Beamish (2008) by computing the total variance of monthly market returns for the firm for the previous 60 months before acquisition announcement. We collect data from CRSP and

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<sup>17</sup> Croci and Petmezas (2015) find in their sample (1996-2011), that the mean (median) for vega is US\$ 130 000 (US\$ 47 000) and the mean (median) delta is approximatively US\$ 842 000 (US\$ 234 000).

<sup>18</sup> Feng and Rao (2018) and Liu and Mauer (2011) find respectively a scaled mean (median) value of 2.8% (1.9%) and 3.3% (2.1%) for vega; 26% (7.7%) and 46% (7.6%) for delta.

<sup>19</sup> Sales represent a firm's total sales in year *t*.

COMPUSTAT. Acquisition activity index is computed as the total industry transaction value divided by total book assets at the 2-digit SIC level. (Moeller et al. 2004; Austin et al. 2016). We follow Croci and Petmezas (2015) in controlling for managerial characteristics. We include CEO overconfidence as several papers show that managerial personality traits play a significant role in acquisitions' decisions (Doukas and Petmezas 2007, Billet and Qian 2008). We construct the variable based on the holder 67 measure of Malmendier and Tate (2005, 2008) and following the methodology of Campbell et al. (2011) and Hirshleifer et al. (2012). However, for Malmendier and Tate, once a CEO is identified as overconfident, she stays that way for the rest of the sample period, therefore we measure it on a yearly basis following Croci and Petmezas (2015). We control for risk aversion using cash compensation, female and age proxy. Regarding cash compensation, Berger et al. (1997) consider that higher cash compensation induces managers to avoid risk that could be detrimental for their current position (Lehn and Zhao, 2006). However, Guay (1999) and Belkhir and Boubaker (2013) show that high levels of CEO cash compensation would give them the possibility to diversify their wealth outside the firm. This would make them more inclined to invest in risky projects and align their interests with their shareholders'. Concerning female executives, Barber and Odean (2001) and Huang and Kisgen (2013) find that male investors take more risks and tend to undertake more acquisitions than female ones. Concerning CEO age, it has been associated with risk aversion as Yim (2013) finds that as the CEO gets older, the propensity to make M&A transactions decreases. Matta et al. (2008) find that younger CEOs tend to take more risks by acquiring abroad. We include CEO tenure to account for managerial entrenchment, as the longer the CEO stays in position, the more powerful and entrenched she is considered.

In order to control for the role of governance mechanisms regarding cross-border mergers and acquisitions (M&A), we include several control variables considered to affect M&A decision (Baugess and Stegemoller 2008). In Panel B, we present four variables related to Governance and Directors from WRDS: independent directors, size of the board of directors, CEO/Chairman duality and dual-class shares. The independence of the board of directors is defined by the ratio between the number of independent directors and the total size of the board. A more independent board can prevent CEOs from gaining more power at the firm and therefore avoid value-destroying investments at the expense of the shareholders. We include the size of the board of directors in our regressions as it has been shown that firms with larger board tend to carry out more acquisitions (Bauguess and Stegemoller, 2008). We measure the power of the CEO by computing the variable CEO/Chairman duality, which takes a value of one if the CEO is also the Chairman of the board and zero otherwise. Concerning the dual-



class shares, it is a binary variable that takes the value of 1 if the company is a dual-class shares firm and zero if not. Masulis et al. (2009) show that executives related to the controlling shareholder in DCS firms receive higher total compensation than those in firms with single class shares.

Panel C and D report summary statistics on the acquiring firms and CEO characteristics. Our results are similar to what Croci and Petmezas (2015) find in their paper. We notice that on average, CEOs stay for a duration of 7 years and a half, with a median of 5 years. Also, most of the companies have male CEOs, as female CEOs represent nearly 2% of the sample. The mean CEO age is around 55 years, which is in line with Yim (2013). Regarding board characteristics (Panel D), we find that independent directors constitute on average 72% of the total board size, well above 50% (68.7%), which is consistent with Duchin et al. (2010). Board size is composed on average of 10 directors, confirming the results found by previous literature (Ferris et al. 2003). On average, the CEO of a firm is also the Chairman in 64% of the cases. Also, 7.5% of the firms included in the sample have a dual class share structure, slightly higher than what Masulis et al. (2009) find for the total Compustat firms (6%).

Panel E presents summary statistics for deal characteristics. On average, 70% of the bidders in our sample complete the acquisition of a firm. Cross-border deals represent about 23% of our sample which is consistent with Ellis, Moeller, Schlingemann and Stulz (2011). Concerning the payment method, the bidding firm uses cash in 37% of the cases, stock in 8% of the cases. When we compare domestic and cross border deals, we get similar results to Moeller and Schlingemann (2005): cross-border transactions exhibit a smaller deal size (\$208 millions) compared to domestic deals (\$573 millions), larger acquirers (log sales equals to 8.3 for cross-border deals vs 7.6 for domestic deals), more often involve tender offers (2.3% vs 1.6%).

[insert Table 2 about here]

## **1.4. Empirical results**

### *1.4.1 Risk-taking incentives and the probability of engaging in a cross-border M&A transaction*

After constructing the sample, we conduct tests of differences for our main compensation variables. The results are presented in table 3. We notice that CEOs pursuing cross-border acquisitions have significantly higher risk-taking incentives (vega) than those engaging in domestic M&A transactions (2.87% vs 2.74%). Moreover, our results show a higher insignificant delta (32.04% vs 31.46%) and a higher significant cash compensation (34.78% vs 31.69%) for CEOs pursuing domestic transactions.

[insert Table 3 about here]

Next, we examine the relationship between risk-taking incentives and the probability of making a cross-border acquisition by controlling for various firm and CEO characteristics, which have been found in the literature to affect acquisitions' decisions. Table 4 reports the results for the analysis. We run our analysis on 21 266 observations because some deals have missing data related to firm and CEO characteristics<sup>20</sup>. However, the characteristics of the two samples are very similar. We still have 76% (24%) of the observations that correspond to domestic (cross-border) deals. Moreover, we compare the summary statistics of both samples and find very similar results in an unreported table<sup>21</sup>. In the first column (1) we run a probit regression where the dependent variable takes a value of one if a firm has engaged in a cross-border acquisition during each of the years 1996 till 2019, and zero otherwise. In order to alleviate concerns over endogeneity, we follow Harford, Mansi, and Maxwell (2008) who show that lagging variables helps control for potential endogeneity. In addition, all regressions control for year and industry fixed effects whose coefficients are suppressed following Croci and Petmezas (2015). Furthermore, we use heteroscedasticity-robust standard errors adjusted also for clustering at firm level.

Our main variable of interest is vega, defined as the sensitivity of CEO wealth to stock return volatility. We also include delta, defined as the sensitivity of CEO wealth to stock price and considered as a measure of incentive-alignment for some (Jensen and Murphy 1990) and a measure of risk-aversion for others (Chava et al. Purnanandam, 2010). The remaining control variables are cash compensation, firm size, debt ratio, book-to-market ratio, cash reserves, Tobin's  $q$ <sup>22</sup>, Prior international acquisition experience, variance of historical returns, acquisition activity index, CEO tenure, age, overconfidence and female<sup>23</sup>. We find that the coefficient on vega is positive and statistically significant at the 5% significance level. Regarding the other compensation variables, we document a negative delta coefficient also statistically significant at the 5% level, whereas the coefficient for cash compensation is positive but not significant. These results show that risk-taking incentives (proxied by vega) given to CEOs of U.S acquiring firms increase the probability of pursuing a foreign target<sup>24</sup>.

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<sup>20</sup> For instance, our overconfidence variable has 29 915 observations. This is also the case in Croci and Petmezas (2015) where the authors construct a sample of 28 853 firm/year observations yet run their analysis on 21 289 firm/year observations.

<sup>21</sup> Our variables of interests (vega and delta) have respectively means of 1 232 000\$ and 248 000\$, whereas delta scaled and vega scaled have respectively means of 25 and 3.28.

<sup>22</sup> We use Tobin's  $q$  in order to account for prior firm performance. However, replacing Tobin's  $q$  by ROA in order to account for the firm's accounting performance does not change our results.

<sup>23</sup> We present the correlation matrix of the variables in Appendix A5. We can clearly see that the correlation between our main variable of interest (vega) and the other control variables is not high. This should mitigate econometric concerns (such as multicollinearity).

<sup>24</sup> Note that our results do not change when we use a linear probability model.

We compute the average marginal effect in order to have the effect on the probability of going abroad (the average change in probability when the independent variable increases by one unit). Therefore, in economic terms, a 1 unit increase in vega boosts the probability of making a cross-border deal by 0.06 units (6%). Overall, our results support Coles et al. (2006), Croci and Petmezas (2015) who find that risk-taking incentives motivate CEOs to make riskier investments. Regarding other control variables, we notice that firm size, debt ratio as well as prior cross-border acquisition experience are all positively related to the probability of conducting a cross-border acquisition at the 1% and 10% significance level, consistent with the M&A literature. Furthermore, our results show negative and significant coefficients for female, age and CEO tenure. These results are consistent with Barber and Odean (2011) who find that male investors take more risks than female ones.

In specification (2), we run an OLS regression where the dependent variable is the number of cross-border deals divided by the total acquisitions made by a firm during each of the years of the sample. Consistent with Specification (1), we observe a positive (negative) coefficient for vega (delta) at the 10% (5%) significance level.

In specification (3), we run a negative binomial regression<sup>25</sup> where the dependent variable is the number of cross-border deals by a firm during each of the years of the sample following Sanders (2001), Nadolska and Barkema (2007), Boeh (2011) and Lewellyn (2018)<sup>26</sup>. Our results confirm that vega is positively related to the number of completed cross-border M&A deals and has a significant coefficient at the 5% level. Regarding delta, the coefficient is still negative and statistically significant at the 5% level. These findings imply that risk-taking incentives increase the probability of engaging in a cross-border acquisition transaction. The signs of the other control variables are in general the same as in specification (1) and (2).

As a robustness check, we split our sample between riskier and safer countries (Table 4). In order to assess the country's riskiness, we use the ICRG (2019) and compare the score obtained by the U.S and the target country in a given year. If the score of the U.S is higher (lower), we consider that the target country is riskier (safer). The results show that the coefficient of vega is positively significant at the 5% level for specification (2) only. This implies that Risk-taking

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<sup>25</sup> Following Cohn et al. (2022) who find that using a GLM model such as Poisson or Negative Binomial can be good alternatives to OLS models because they “can accommodate outcomes with a value of zero and requires no assumptions about higher order model error moments for consistent estimation.”

<sup>26</sup> We run our analysis on the sub-sample containing only cross-border deals. The dependent variable takes limited integer values greater than or equal to 1 in a given year, thus the ordinary least squares (OLS) regression techniques are inappropriate since the assumption of homoscedastic normally distributed error term is violated. We use a negative binomial regression because it is well suited to handle the problems of overdispersion often associated with this type of dependent variable.

incentives motivate U.S CEOs to pursue cross-border M&As in riskier target countries than the U.S.

[Insert Table 4 about here]

Furthermore. We replicate the results of Croci and Petmezas (2015) by using a sample composed of COMPUSTAT firms. The sample includes companies that engaged and did not engage in M&A activity between 1996 and 2019. Similarly, we use delta, vega and cash compensation as proxies for executive compensation. We find very similar results to what the authors found (appendix A3).

[Insert Table 5 about here]

#### *1.4.2 Risk-taking incentives and the probability of completion a cross-border deal*

After examining the impact of risk-taking incentives on the probability of engaging in a cross-border M&A deal, we examine whether CEO compensation incentives motivate them to complete the deal. As a preliminary test, we conduct tests of differences in order to see whether there were disparities between domestic and cross-border deals regarding M&A deal completion. The results are reported in table 6. We can notice that on average, 78% of announced cross-border deals are completed vs 68% for domestic deals. Moreover, 52% of the announced cross-border deals are between two firms from the same industry (horizontal deal) whereas 64% of announced domestic deals concern firms from the same industry. These preliminary results show that CEOs pursuing cross-border transactions complete more deals. Also, firms pursuing domestic deals engage more in horizontal deals than those engaging in cross-border deals. Our univariate results are significant at the 1% level.

[Insert Table 6 about here]

In order to confirm the previous result, in table 7 specification (1), we run a probit regression for the full sample, where the dependent variable takes the value of one if the firm completed an M&A deal in a given year, and zero otherwise. In addition to the control variables used in the previous analysis, we include controls for deal characteristics that have been found to be related to M&A deal completion. Table 7 reports the results of the analysis. Like the previous analysis, we mitigate endogeneity concerns by lagging our independent variables. All regressions control for year and industry fixed effects whose coefficients are suppressed. Moreover, we use heteroscedasticity-robust standard errors adjusted for clustering at firm level. We include deal characteristics controls such as horizontal deal, tender offer, cash payment, compete, hostile and the number of target advisors in addition to the control variables used in the previous analysis. We find that the coefficient of our main variable of interest (i.e., vega) is positive and statistically significant at the 10% level. The other two compensation variables

have negative but insignificant coefficient. Regarding the other control variables, they are consistent with the prior literature. Size for instance has a negative and significant (at the 1% significance level) coefficient consistent with Moeller et al. (2004) who find that the losses incurred by large firms are much larger than the gains realized by small firms<sup>27</sup>. Moreover, the M&A deal has more chances to be completed when the two firms are in the same industry, the bid is a tender offer, there are fewer competing bids, the deal is not hostile, and the target has numerous advisors.

The next step consists of investigating the relationship between risk taking incentives and the probability of deal completion for domestic and cross-border deals. Two methodologies arise for testing the association. The first one consists of including a cross-border dummy and use interaction terms with both vega and delta. The second one requires to split the sample between domestic and cross-border deals and test our relationship. However, Chunrong Ai and Edward Norton (2003) show that the interaction terms in non-linear models cannot be evaluated by looking at the sign, magnitude and significance of the coefficient. Therefore, we split our sample into two subsamples: domestic and cross-border transactions. In specification (2), we include only domestic M&A deals. We can notice that the coefficient of vega is positive yet insignificant. This result is in line with Becher and Juergens (2013) who find that managerial incentive compensation do not play a role in completing domestic M&A deals. The signs on the other control variables exhibit in general the same relation as in specification (1). In specification (3), we include only cross-border M&A deals. In this case, the coefficient of vega is not only positive but significant at the 5% level. Moreover, delta is negatively related to the probability of deal completion in this case, and significant at the 10% level. In general, the other control variables have the same signs as in specification (1) and (2). Overall, our results show that risk-incentives motivate CEOs to engage and complete cross-border deals.

[Insert Table 7 about here]

#### *1.4.3 Endogeneity concerns*

The potential for endogeneity between corporate investment decisions and compensation elements has been well documented in the literature (Coles et al., 2006; Core & Guay, 1999). Several methods have been used to mitigate endogeneity concerns. For instance, Harford, Mansi and Maxwell (2008) who study the impact of corporate governance on cash holdings, lag the governance variables arguing that lagging helps control for potential endogeneity.

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<sup>27</sup> Moeller et al. (2004) document that small firms are good acquirers and large firms are not. Shareholders from small firms earn \$9 billion from the acquisitions made during the period 1980-2001, whereas the shareholders from large firms lose \$312 billion.

However, the most common methodology used to alleviate endogeneity concerns is the use of 2SLS (Coles et al., 2006; Liu & Mauer, 2011). The problem in using 2 SLS is the difficulty of identifying appropriate instrumental variables. Palia (2011) discusses in detail the endogeneity issues related to compensation and firm valuation, which have implication for corporate decisions. The author draws a list of instruments that can be considered in 2-SLS estimations (namely CEO age, CEO education, CEO tenure and firm risk). However, we control for three out of four of these instruments in our main regression. Moreover, the fourth variable CEO education cannot be used because the databases we used do not provide such information. As a result, we follow Ferrel, Liang and Renneboog (2016) who work on the relation between governance and corporate social responsibility. The authors use the industry peers' average financial policies as an instrumental variable for firm-level financial policies. Moreover, they compute the arithmetic means of each of their five financial policies variables by industry and by year. In our case, we compute the average vega of firms' CEOs per industry and per year. The use of the industry's average vega can be justified by the idea that a firm's CEO vega can be similar and thus affected by the ones of the industry they belong to. Furthermore, little reason exists to believe that a firm's decision to engage in a cross-border acquisition is affected by its peer firms' CEO vega. For these reasons, we use the industry peers' average CEO vega as an instrumental variable for CEO vega. The results are reported in table 8. We find that our predicted vega is positively and significantly (at the 5% level) related to the probability of engaging in a cross-border merger and acquisition. The signs and significance of the other control variables are in general similar to our main result.

[Insert Table 8 about here]

#### *1.4.4 The role of corporate governance*

In this section, we test the role of corporate governance mechanisms on the relationship between risk-taking incentives and the probability of engaging in cross-border mergers and acquisitions. We begin by investigating the role of CEO power on the association between risk-taking incentives and the propensity of acquire a foreign target. Managerial power theory suggests that powerful managers exercise their influence over the board in order to set up their own compensation and extract additional rents from their firms (Bebchuk et al. 2002). Several measures have been used in the literature for CEO power. Among them, a dummy variable that takes a value of one if the CEO is the board chair (Al Shammari et al. 2009, Cheng et al. 2014). The combined CEO and board chair position gives the CEO significant authority and influence over the board. Consequently, we split our sample according to the incidence (CEO/Chairman duality=1) or the absence (CEO/Chairman duality=0) of CEO/Chairman duality and re-run our

regressions on the two generated sub-samples. The results are presented in table 9. We find that the significantly positive relationship between *vega* and cross-border M&As persists when the CEO is also the chairman of the firm. This result suggests that risk-taking incentives motivate powerful CEOs to pursue international acquisitions. Since a powerful CEO implies a weaker board, we proceed our analysis by examining the impact of corporate governance mechanisms on our main relationship.

[Insert Table 9 about here]

Precisely, we investigate whether corporate governance mechanisms have a significant impact on the relationship between risk-incentives (*vega*) and the probability of engaging in cross-border deals. In order to do that, we use four main governance variables that have been widely used in the literature. The first variable considered is independent directors. Several authors have argued that directors that do not have ties to a given company other than directorship, are better suited to reduce agency costs (Balsmeier, 2017) and limit managerial discretion by punishing managers after undesirable outcomes (Fama and Jensen, 1983; Williamson, 1983). The next variable included is board size. Jensen (1993) documents that relying on smaller board can help improve the performance of the firm and reduce the control of the CEO. Moreover, Bauguess and Stegemoller (2008) show that companies with larger boards are more likely to engage in acquisitions. In order to control for CEO power and entrenchment, we include a binary variable CEO/Chairman, that takes a value of one if the CEO is also the chairman of the board, and zero otherwise. For the past two decades, the CEO duality has been one of the most widely discussed corporate governance issues especially after the occurrences of the Enron and WorldCom Inc. scandals. Core et al. (1999) and Goyal and Park (2002) find that when the CEO and COB (Chairman of the board) titles are combined, the CEO is paid more and the sensitivity of CEO turnover to firm performance is lower. Our final variable is dual class structure (DCS), defined as a binary variable that takes the value of one if the firm is a dual-class shares company, and zero otherwise. Under the managerial power theory (Bebchuk and Fried, 2003), the fact that dual class executives earn higher total compensation than single class executives (Masulis et al. 2009) may not be incentive-based. The clear example of Magna International (a dual class firm) that paid its vice-chairman (a relative of the founder) \$2.6 million US for special consulting services in 2009 and lost nearly 500 million dollars the same year.

These variables are defined in Appendix A. Our main variable of interest is *vega*. As before, we use a probit regression where the dependent variable takes the value of one if the firm engages in a cross-border deal in a given year, and zero otherwise. We also include our four variables controlling for governance mechanisms. The results are reported in table 10. Our

findings show that the vega coefficient remains positive and significant at the 5% level even after adding the four governance variables. This indicates that corporate governance mechanisms do not alter the relationship between risk-taking incentives and cross-border acquisitions. The coefficient of delta remains negative and significant at the 5% level as well. The signs of the explanatory variables are similar to previous analysis.

[Insert Table 10 about here]

We do not include interactions between our variable of interest and the different governance variables in the probit regression following Chunrong Ai and Edward Norton (2003) who show that the interaction terms in non-linear models cannot be evaluated by looking at the sign, magnitude and significance of the coefficient. However, for robustness checks, we use an OLS regression with the interaction terms (Table 11). The results are in line with Croci and Petmezas (2015) who find that governance mechanisms do not have an impact on the relationship between risk-taking incentives and acquisition investments. In sum, our findings show that corporate governance does not generally affect the relationship between risk-taking incentives and the probability of engaging in a cross-border deal.

[Insert Table 11 about here]

#### *1.4.5 The role of prior international experience*

In this section, we examine whether the firm's prior international experience plays a role in offsetting the relationship between risk-taking incentives and the probability of engaging in a cross-border deal. Prior international experience can be perceived as a considerable advantage for firms willing to explore international markets. Firms with significant knowledge of doing business in foreign markets, will avoid mistakes and make adequate decisions in relation to future foreign business expansions (Davidson 1980, Johanson & Valne 1977). However, firms with little to no foreign experience can face significant complex challenges (culture change for example). We investigate whether risk-taking incentives (vega) motivate CEOs of firms with little or no international experience to engage in international transactions.

In order to test that, we use the ratio of foreign sales, defined as the ratio between the sales of the firm outside the United States divided by the firm's total sales<sup>28</sup> (Matta and Beamish, 2008). The results are presented in table 12. Specification (1) shows our results using the full sample. Vega is positively and significantly (at the 5% level) related to the probability of making a cross-border deal. Furthermore, a firm's prior cross-border experience increases the likelihood of engaging in a foreign M&A, in line with Holcomb et al. (2009). In specification (2) and (3),

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<sup>28</sup> computed using COMPUSTAT Segments.



we split the sample in two categories respectively, using the median of the ratio of foreign sales (Masulis et al. 2007). Firms for which the foreign sales ratio is below (higher than) the sample median are considered to have low (high) international experience. The results of specification (2) show that the relationship between vega and the probability of engaging in international acquisitions is positive and significant at the 1% significance level. This indicates that CEOs are incentivized through risk-taking incentives to make cross-border acquisitions despite managing firms with low international experience. In specification (3), we run our analysis on the sub-sample including firms with high international experience. We find that vega is not significant. This result indicates that a firm's low international experience does not demotivate CEOs from engaging in cross-border acquisitions.

[Insert Table 12 about here]

#### *1.4.6 Risk-taking incentives and firm performance*

In this section, we address the question of whether CEO risk-taking incentives lead to higher firm performance. In order to do that, we use a firm's market-based performance as well as its accounting performance. Regarding market-based performance, Datta et al. (2001) and Tehranian et al. (1987) document a positive relationship between incentive-based compensation (delta in our case) and acquiring firm announcement stock returns. Croci and Petmezas (2015) find a positive and significant (at the 5% level) coefficient for vega when examining the impact of risk-incentives on the acquiring firm's returns. We begin by conducting tests of differences of 3-day cumulative abnormal returns (CARs) between domestic and cross-border acquirers. The results are reported in Table 13. The returns are calculated using the conventional market model (Brown and Warner, 1985) with market parameters estimated over the period starting 240 days and ending 41 days prior to the announcement. CRSP value-weighted index return is the market return. As a robustness check, we also compute the returns using the market adjusted returns model (MAR), with  $\alpha = 0$ , and  $\beta = 1$ . Consistent with Moeller and Schlingemann (2005), we find that U.S firms pursuing domestic acquisitions generate higher and significant abnormal returns than the ones engaging in international acquisitions. This result highlights the riskiness of cross-border acquisitions compared to domestic ones.

[Insert Table 13 about here]

We proceed our analysis using OLS regression where the dependent variable is the bidder 3-day CARs surrounding the acquisition announcement. In addition to the set of explanatory variables use in the previous analysis, we include variables such as the firm's market value, horizontal acquisition, completed, hostile, stock payment, dummy for cross-border, number of

target advisors, compete dummy, public target, tender offer and termination fee, which have been found by prior studies to affect bidder announcement returns. Table 14 reports the results of the impact of CEO compensation on firm performance. In specification (1), we report the results for the full sample. Consistent with Croci and Petmezas (2015), vega has a positive and significant (at the 10% level) coefficient. This finding shows that CEO risk-taking incentives (vega) increase the acquiring shareholders' wealth. The signs of the control variables are in general consistent to the prior M&A literature. For instance, the size of the firm (significant at the 1% level), cash reserves, stock payment, compete dummy and hostile have a negative coefficient, whereas the number of target advisors is positively related to the CARs. Moreover, we include a cross-border dummy which has a negative and significant (at the 10% level) coefficient, as well as interaction terms between vega and cross-border, and delta and cross border. We find that the coefficients of the interaction are not significant. We proceed by splitting the sample into two categories: domestic deals (specification 2) and cross-border deals (specification 3). In specification (2), we find the same result as in specification (1): a positive and significant (at the 10% level) relationship between risk-taking incentives and the CARs. However, in specification (3) which includes exclusively cross-border M&A transactions, we find no significant relationship between vega and CARs. These results indicate that the significantly positive association between CEO risk-taking incentives and shareholders' wealth is driven by domestic deals.

[Insert Table 14 about here]

Regarding long-term performance, despite that a significant number of studies have been based on the BHARs, it has been shown that BHARs are often insignificant once the biases in the BHAR methodology are corrected for (Renneboog and Vansteenkiste, 2019). For that reason, we proceed our analysis by examining the post-acquisition accounting performance of the firms in our sample. We follow Ozkan (2012) who use accounting measures while analyzing the change in shareholder wealth in foreign acquisitions. We use accounting measures documented in the M&A performance literature: ROA, Tobin's Q, ROE and ROI (Das and Kapil, 2012). Results are reported in table 15. Consistent with Ozkan (2012), we find that shareholder wealth declines considerably in foreign acquisitions. Furthermore, and most importantly, we find that accounting M&A performance is worse for cross-border deals compared to domestic deals, underlining the riskiness of cross-border transactions.

[Insert Table 15 about here]

## 1.5 Conclusions and discussions

Consistent with the literature linking risk-taking incentives to risky investment decisions, we find that higher vega induces U.S CEOs to engage in riskier investments, namely cross-border mergers and acquisitions in our case. In economic terms, a one unit increase in vega boosts the probability of making a cross-border deal by 0.06 units (6 percentage points).

In addition, we provide evidence that higher risk-taking incentives do not only motivate CEOs to engage in international M&A deals, but also to complete them. Our results show that corporate governance mechanisms do not play a role in offsetting the relationship between vega and the probability of acquiring a foreign target. Moreover, we show that our result is driven by CEOs managing firms with little or no international experience. Finally, we find a positive association between CEO risk-incentives and bidder announcement returns. However, this result is driven by firms engaging in domestic M&As, highlighting the riskiness of cross-border transactions. We confirm the latter result by using accounting measures showing that firms pursuing cross-border M&As perform worse than those engaged in domestic deals.

Our findings have also important implications. First, despite the need of using risk-taking incentives (vega) to motivate risk-averse CEOs to take more risks, we show that in some cases, risk-taking incentives induce CEOs to invest in over-risky investments (cross-border deals in our case). Furthermore, our results suggest that governance mechanisms in place do not always prevent CEOs of pursuing over-risky investments. Therefore, firms should implement more efficient solutions to this problem. Finally, the positive relationship between vega and bidder announcement returns shows that in some cases (domestic deals in our case), risk-taking incentives can induce managers to select better investment choices.

Nevertheless, the results from this study should be interpreted with some caution. First, our results highlight the riskiness of cross-border M&A deals based on a large sample of M&A and transactions. However, not all cross-border deals entail the same level of risk. Motivations to pursue international transactions may depend on other hidden factors. Further research can be done in that direction. Second, we study short-term market reactions to acquisition announcements. However, examining the long-term effect can be interesting as a decision like an acquisition can take time to realize (Cui and Leung 2020). Third, future research can also consider the firm's ownership structures (Caprio et al. 2011). Finally, several papers highlight the impact of CEOs' personality traits and behaviors on M&A decisions. While we take into account CEO overconfidence, the variable is based on CEO option-compensation. Our results

could be confirmed by computing another “behavioral” variable based on pronouns for instance (Aktas et al. 2016).

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**Table 1: Sample construction and data sources**

The table presents the detailed steps for the construction of our final sample. It reports the different databases used for this study, the number of acquiring firms. The final sample is composed of 36 987 M&A deals observations over the period 1996-2019.

<b>Data Sources</b>	<b>M&amp;A deals</b>	<b>Number of Acquiring firms</b>
<i>Initial Sample</i> <sup>29</sup> (SDC THOMSON)	1 028 081	375 485
<i>Filters applied</i>		
<i>Acquirer Nation= US</i>	274 090	92 965
<i>Domestic</i>	218 756	76 771
<i>Cross-Border</i>	55 334	16 194
<i>Acquirer Public Status= Public</i>	112 135	21 228
<i>Domestic</i>	91 485	17 966
<i>Cross-Border</i>	20 650	3 262
<i>Owns less than 50% prior to announcement and at least 51% after the transaction (If completed)</i> <sup>30</sup>	103 673	20 794
<i>Domestic</i>	85 266	17 671
<i>Cross-Border</i>	18 407	3 123
<i>Merged with Compustat</i>	66 998	8 550
<i>Domestic</i>	55 486	7 623
<i>Cross-Border</i>	11 512	927
<i>Merged with Execucomp/Directors/Governance</i>	<b>36 987</b> <sup>31</sup>	<b>2 856</b>
<i>Domestic</i>	28 781	2 449
<i>Cross-Border</i>	8 206	407

<sup>29</sup> All M&A deals from SDC Thomson over the period 1996-2019.

<sup>30</sup> We keep all announced deals + completed deals when the bidder acquirers at least 51% of the target after the transaction. Note that completed deals that do not provide information on the bidder's ownership after the transaction are dropped.

<sup>31</sup> We adjust the sample by dropping observations for which we have missing values of vega.

**Table 2: Descriptive statistics**

The table reports the summary statistics on CEO compensation, acquisitions, and firm and other CEO characteristics for U.S firms with data on Execucomp over the period 1996-2019. We report the mean, median and standard deviation of CEO compensation variables, acquiring firm characteristics, CEO characteristics, Board characteristics and deal characteristics. The variables are defined in Appendix A.

	Mean	Median	Standard Deviation	Observations
<b><u>Panel A: Compensation variables for CEOs of acquiring firms</u></b>				
Delta (\$ 1000)	1 303.78	326.00	4 061	34 983
Vega (\$ 1000)	196.79	67.38	342.76	34 926
Cash compensation (\$ 1000)	1 401.82	994.23	1 470.76	34 825
Delta Scaled (%)	31.91	6.941	117.84	34 874
Vega Scaled (%)	2.77	1.751	3.587	34 825
Cash compensation (%)	34.08	25.74	26.09	34 949
<b><u>Panel B: Board characteristics</u></b>				
Dual-Class Share	0.074	0	0.2630	28 474
Independent directors	0.727	0.7692	0.1575	28 553
Board size	10.187	10	3.223	28 553
CEO/Chairman duality	0.6430	1	0.4791	28 553
<b><u>Panel C: Acquiring firms' characteristics</u></b>				
Size (log Sales)	7.812	7.670	1.725	34 825
Book to Market	0.009	0.003	0.013	31 777
Cash reserves	0.132	0.075	0.145	34 825
Debt ratio	0.238	0.222	0.177	34 825
Cash flows	0.091	0.0909	0.070	33 577
Prior cross-border experience	0.2669	0	0.442	34 825
Foreign sales ratio	0.277	0.251	0.248	30 894
Capex	0.040	0.0291	0.041	34 787
Tobin's Q	1.480	1.082	1.402	34 825
ROA	0.1358	0.1314	0.078	34 582
ROE	0.038	0.0473	0.075	34 825
Historical monthly returns	0.106	0.094	0.050	34 825
Acquisition activity Index	0.037	0.037	0.039	34 825
<b><u>Panel D: CEO characteristics</u></b>				
Overconfidence	0.4024	0	0.4904	29 915
Female	0.0205	0	0.1418	34 825
CEO tenure	7.187	5	6.935	34 825
Age	55.618	56	7.040	34 825
<b><u>Panel E: Deal characteristics</u></b>				
Completed	0.7052	1	0.4559	34 825
Horizontal	0.6142	1	0.4867	34 825
Cross-Border	0.2245	0	0.4172	34 825
Friendly	0.7947	1	0.4038	34 825
Stock payment	0.0790	0	0.2697	34 825
Cash payment	0.3712	0	0.4831	34 825
CARs [-1, 1]	0.0041	0.0022	0.045	29 112

**Table 3: Tests of Differences for CEO compensation**

The table presents tests of differences in means. The statistical significance of the difference in mean, for each dependent variable are indicated by \*, \*\* and \*\*\* for 10%, 5%, and 1% level of significance, respectively. All variables are defined in the appendix. Note that all independent variables are lagged with respect to the dependent variable.

	<b>Full sample</b>	<b>Cross-Border</b>	<b>Domestic</b>	<b>Difference</b>	<b>t-stat</b>
<i>Vega Scaled</i>	2.77	2.879	2.748	0.130	2.824***
<i>Delta Scaled</i>	31.91	31.46	32.04	-0.579	0.3816
<i>Cash compensation Scaled</i>	34.08	31.69	34.78	-3.09	9.27***

**Table 4: risk-taking incentives: Riskier countries vs Safer countries**

The table presents (1) the estimates of a probit regression with industry and fixed effects clustered standard errors at firm level where the dependent variable takes the value of 1 if a firm has engaged in a cross-border acquisition during each of the years 1996 till 2019, and zero otherwise. Specification (2) includes deals with riskier countries. Specification (3) includes deals with safer countries. The sample period is between January 1, 1996 and December 31, 2019 for the universe of US publicly listed firms with data on ExecuComp. See Appendix A for definitions of variables. All independent variables are lagged with respect to the dependent variable. All variables are winsorized at the 1% on both tails, with the exception of binary variables. Heteroscedasticity-robust clustered standard errors at firm level are reported in brackets. The symbols \*, \*\* and \*\*\* denote statistical significance at the 10%, 5%, and 1% levels, respectively. Note that the results hold even when excluding firms from the financial industries (sic code 6000-6999) and utility firms (sic code 4900-4999).

<i>Probability of cross-border M&amp;A</i>	<i>Full Sample</i>	<i>Riskier Countries</i>	<i>Safer Countries</i>
	(1) Probit	(2) Probit	(3) Probit
<b><i>Variable of Interests</i></b>			
<i>Scaled Vega</i>	0.278** (0.141)	0.340** (0.162)	0.160 (0.184)
<i>Scaled Delta</i>	-0.017** (0.008)	-0.019* (0.010)	-0.013 (0.009)
<i>Scaled Cash compensation</i>	0.012 (0.050)	0.012 (0.062)	0.017 (0.061)
<b><i>Acquiring firm control variables</i></b>			
<i>Firm size</i>	0.081*** (0.009)	0.0287** (0.011)	0.117*** (0.011)
<i>Debt ratio</i>	0.110* (0.065)	-0.060 (0.082)	0.274*** (0.078)
<i>Book to market</i>	-0.922 (1.095)	-1.039 (1.338)	-0.807 (1.374)
<i>Cash reserves</i>	-0.118 (0.085)	-0.129 (0.105)	-0.144 (0.104)
<i>Tobin's Q</i>	0.008 (0.009)	0.001 (0.011)	0.015 (0.010)
<i>Prior cross-border experience</i>	0.195*** (0.024)	0.185*** (0.030)	0.165*** (0.029)
<i>Variance of historical Returns</i>	-0.235 (0.269)	-0.868** (0.348)	0.345 (0.323)
<i>Acquisition Activity Index</i>	-1.086*** (0.326)	-0.837** (0.420)	-1.137*** (0.401)
<b><i>Acquiring CEO characteristics</i></b>			
<i>CEO overconfidence</i>	0.005 (0.022)	0.004 (0.028)	-0.001 (0.027)
<i>CEO tenure</i>	-0.007*** (0.001)	-0.005*** (0.002)	-0.006*** (0.002)
<i>CEO age</i>	-0.004** (0.001)	-0.001 (0.002)	-0.005*** (0.002)
<i>female</i>	-0.192*** (0.068)	-0.268*** (0.090)	-0.121 (0.082)
Year and Industry FE	Yes	Yes	Yes
Pseudo R <sup>2</sup>	0.0788	0.0824	0.1081
Number of Observations	21 266	18 908	18 609

**Table 5: risk-taking incentives and cross-border mergers and acquisitions.**

The table presents (1) the estimates of a probit regression with industry and fixed effects clustered standard errors at firm level where the dependent variable takes the value of 1 if a firm has engaged in a cross-border acquisition during each of the years 1996 till 2019, and zero otherwise. Specification (2) presents the estimates of an OLS regression with clustered standard errors at firm level where the dependent variable is the ratio of number of cross-border M&A deals by a firm during each of the years 1996 till 2019 divided by the total acquisitions conducted by the same firm. Specification (3) presents the estimates of a negative binomial regression with clustered standard errors at firm level where the dependent variable is the number of cross-border M&A deals by a firm during each of the years 1996 till 2019 following previous studies<sup>32</sup>. The sample period is between January 1, 1996 and December 31, 2019 for the universe of US publicly listed firms with data on ExecuComp. See Appendix A for definitions of variables. All independent variables are lagged with respect to the dependent variable. All variables are winsorized at the 1% on both tails, with the exception of binary variables. Heteroscedasticity-robust clustered standard errors at firm level are reported in brackets. The symbols \*, \*\* and \*\*\* denote statistical significance at the 10%, 5%, and 1% levels, respectively. Note that the results hold even when excluding firms from the financial industries (sic code 6000-6999) and utility firms (sic code 4900-4999).

	<i>Probability of cross-border M&amp;A</i>	<i>Number of CB deals/ Total acquisitions</i>	<i>Number of Cross-border M&amp;As</i>
	(1) Probit	(2) OLS	(3) Negative Binomial
<b><i>Variable of Interests</i></b>			
<i>Scaled Vega</i>	0.278** (0.141)	0.113* (0.059)	0.237** (0.190)
<i>Scaled Delta</i>	-0.017** (0.008)	-0.004* (0.002)	-0.041** (0.019)
<i>Scaled Cash compensation</i>	0.012 (0.050)	-0.008 (0.014)	-0.131 (0.150)
<b><i>Acquiring firm control variables</i></b>			
<i>Firm size</i>	0.081*** (0.009)	0.011*** (0.003)	0.179*** (0.029)
<i>Debt ratio</i>	0.110* (0.065)	0.040 (0.026)	-0.426* (0.222)
<i>Book to market</i>	-0.922 (1.095)	-0.110 (0.326)	-6.601* (3.46)
<i>Cash reserves</i>	-0.118 (0.085)	-0.060** (0.030)	-0.806*** (0.289)
<i>Tobin's Q</i>	0.008 (0.009)	0.006 (0.003)	0.057** (0.022)
<i>Prior cross-border experience</i>	0.195*** (0.024)	0.054*** (0.012)	0.292*** (0.090)
<i>Variance of historical Returns</i>	-0.235 (0.269)	-0.100 (0.098)	-0.821 (0.821)
<i>Acquisition Activity Index</i>	-1.086*** (0.326)	-0.077 (0.067)	-2.137*** (0.678)
<b><i>Acquiring CEO characteristics</i></b>			
<i>CEO overconfidence</i>	0.005 (0.022)	0.009 (0.006)	0.100 (0.064)
<i>CEO tenure</i>	-0.007*** (0.001)	-0.0006 (0.0007)	-0.015*** (0.005)
<i>CEO age</i>	-0.004** (0.001)	-0.001** (0.0006)	-0.012** (0.005)
<i>female</i>	-0.192*** (0.068)	-0.016 (0.026)	-0.188 (0.172)
Year and Industry FE	Yes	Yes	Yes
Pseudo R <sup>2</sup>	0.0788	0.091	0.0677
Number of Observations	21 266	21 266	4917

<sup>32</sup> Sanders (2001), Nadolska and Barkema (2007), Hitt et al. (1996), Krista Lewellyn (2018).



**Table 6: Tests of Differences**

The table presents tests of differences in means. The statistical significance of the difference in mean, for each dependent variable are indicated by \*, \*\* and \*\*\* for 10%, 5%, and 1% level of significance, respectively. All variables are defined in the appendix. Note that all independent variables are lagged with respect to the dependent variable.

	Full sample	Cross-Border	Domestic	Difference	p-Value
<b>Completed deals</b>	0.7051	0.7883	0.6814	0.1068***	0.000
<b>Horizontal deals</b>	0.6142	0.5231	0.6402	0.117***	0.000

**Table 7: risk-taking incentives and the probability of completing a cross-border M&A**

The table presents (1) the estimates of a probit regression with clustered standard errors at firm level where the dependent variable takes the value of 1 if a firm has COMPLETED a cross-border acquisition during each of the years 1996 till 2019, and zero otherwise. The sample period is between January 1, 1996 and December 31, 2019 for the universe of US publicly listed firms with data on ExecuComp. See Appendix A for definitions of variables. All independent variables are lagged with respect to the dependent variable. All variables are winsorized at the 1% on both tails, with the exception of binary variables. Heteroscedasticity-robust clustered standard errors at firm level are reported in brackets. The symbols \*, \*\* and \*\*\* denote statistical significance at the 10%, 5%, and 1% levels, respectively. (2) includes only domestic deals and (3) includes exclusively Cross-Border deals. Note that the results hold even when excluding firms from the financial industries (sic code 6000-6999) and utility firms (sic code 4900-4999).

<i>Probability of deal completion</i>	<i>Full Sample</i>	<i>Domestic deals</i>	<i>Cross-border deals</i>
	(1) Probit	(2) Probit	(3) Probit
<b><i>Variable of Interests</i></b>			
<i>Scaled Vega</i>	0.299* (0.165)	0.159 (0.209)	0.864** (0.389)
<i>Scaled Delta</i>	-0.010 (0.009)	-0.006 (0.011)	-0.039* (0.021)
<i>Scaled Cash compensation</i>	-0.054 (0.065)	0.011 (0.082)	-0.146 (0.122)
<b><i>Acquiring firm control variables</i></b>			
<i>Firm size</i>	-0.114*** (0.011)	-0.069*** (0.014)	-0.204*** (0.022)
<i>Debt ratio</i>	-0.266*** (0.084)	-0.335*** (0.105)	-0.087 (0.161)
<i>Book to market</i>	-1.690 (1.368)	-0.785 (1.680)	-2.582 (3.119)
<i>Cash reserves</i>	-0.450*** (0.108)	-0.409*** (0.132)	-0.518** (0.225)
<i>Tobin's Q</i>	0.004 (0.011)	-0.003 (0.014)	0.023 (0.022)
<i>Variance of historical Returns</i>	-0.968** (0.345)	-1.196*** (0.417)	-1.096 (0.707)
<i>Acquisition Activity Index</i>	-0.147 (0.413)	0.207 (0.511)	-0.507 (0.773)
<b><i>Acquiring CEO characteristics</i></b>			
<i>CEO overconfidence</i>	0.015 (0.029)	0.003 (0.036)	0.044 (0.055)
<i>CEO tenure</i>	0.002 (0.002)	0.005 (0.002)	-0.005 (0.004)

<i>CEO age</i>	-0.002 (0.002)	-0.0008 (0.002)	-0.012*** (0.004)
<i>female</i>	0.029 (0.087)	-0.108 (0.109)	0.271 (0.157)
<b><i>Deal characteristics</i></b>			
<i>Horizontal M&amp;A</i>	0.210*** (0.030)	0.234*** (0.039)	0.083* (0.049)
<i>Tender Offer</i>	0.603*** (0.151)	0.644*** (0.205)	0.327 (0.215)
<i>Cash payment</i>	-0.012 (0.033)	-0.019 (0.043)	0.286*** (0.068)
<i>Compete</i>	-1.239*** (0.169)	-1.277*** (0.217)	-1.285*** (0.241)
<i>Hostile</i>	-2.958*** (0.051)	-3.324*** (0.067)	-1.577*** (0.087)
<i>Number of Target Advisors</i>	0.538*** (0.035)	0.574*** (0.044)	0.380*** (0.054)
Year and Industry FE	Yes	Yes	Yes
Pseudo R <sup>2</sup>	0.5450	0.6421	0.2200
Number of Observations	21 266	16 359	4 907

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**Table 8: two-stage least squares (2SLS)**

The table presents the estimates of a two-stage least squares 2SLS regressions where the dependent variable takes the value of 1 if a firm has engaged in a cross-border acquisition during each of the years 1996 till 2019, and zero otherwise. The sample period is between January 1, 1996 and December 31, 2019 for the universe of US publicly listed firms with data on ExecuComp. See Appendix A for definitions of variables. All independent variables are contemporaneous. All variables are winsorized at the 1% on both tails, with the exception of binary variables. Heteroscedasticity-robust clustered standard errors at firm level are reported in brackets. The symbols \*, \*\* and \*\*\* denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	<i>First stage results (OLS)</i>	<i>Second stage results-Probit</i>
	<i>Scaled Vega</i>	<i>Probability of cross-border M&amp;A</i>
<b><i>Variable of Interests</i></b>		
<i>Average vega per industry/year</i>	0.776*** (0.147)	
<i>Scaled Vega</i>		1.034** (0.512)
<i>Scaled Delta</i>	0.051*** (0.005)	-0.053** (0.027)
<i>Scaled Cash compensation</i>	-0.029*** (0.003)	0.043 (0.049)
<b><i>Acquiring firm control variables</i></b>		
<i>Firm size</i>	0.001* (0.0006)	0.090*** (0.009)
<i>Book to Market</i>	0.062 (0.050)	-0.629 (0.951)
<i>Debt ratio</i>	0.003 (0.003)	0.094 (0.063)
<i>Cash reserves</i>	0.001 (0.005)	-0.219** (0.087)
<i>Prior cross-border experience</i>	0.003*** (0.001)	0.210*** (0.023)
<i>Historical Returns</i>	-0.136*** (0.016)	0.268 (0.268)
<i>Acquisition Activity Index</i>	0.035** (0.015)	-1.052*** (0.315)
<b><i>Acquiring CEO characteristics</i></b>		
<i>CEO overconfidence</i>	-0.020*** (0.001)	0.010 (0.024)
<i>CEO tenure</i>	-0.002 (0.001)	-0.006*** (0.001)
<i>CEO age</i>	-0.006 (0.001)	-0.006*** (0.001)
<i>female</i>	0.013* (0.007)	-0.168** (0.068)
Year and Industry FE	Yes	Yes
Number of Observations	22 842	22 842
Pseudo R squared	0.0816	0.0816

**Table 9: Risk-taking incentives and CEO power**

The table presents the estimates of a probit regression with clustered standard errors at firm level where the dependent variable takes the value of 1 if a firm has engaged in a cross-border acquisition during each of the years 1996 till 2019, and zero otherwise. Specification (1) includes observations when the CEO is also the chairman of the firm. Specification (2) includes observations when the CEO is not the chairman of the firm. The sample period is between January 1, 1996 and December 31, 2019 for the universe of US publicly listed firms with data on ExecuComp. See Appendix A for definitions of variables. All independent variables are lagged with respect to the dependent variable. All variables are winsorized at the 1% on both tails, with the exception of binary variables. Heteroscedasticity-robust clustered standard errors at firm level are reported in brackets. The symbols \*, \*\* and \*\*\* denote statistical significance at the 10%, 5%, and 1% levels, respectively.

<i>Probability of engaging in a CB deal</i>	<i>CEO/Chairman=1</i>	<i>CEO/Chairman=0</i>
	(1) Probit	(2) Probit
<b><i>Variable of Interests</i></b>		
<i>Scaled Vega</i>	0.500*** (0.180)	0.057 (0.279)
<i>Scaled Delta</i>	-0.0301*** (0.0111)	-0.003 (0.017)
<i>Scaled Cash compensation</i>	0.0336 (0.0708)	-0.058 (0.101)
<b><i>Acquiring firm control variables</i></b>		
<i>Firm size</i>	0.0804*** (0.0130)	0.085*** (0.017)
<i>Debt ratio</i>	0.0593 (0.0964)	0.098 (0.125)
<i>Book to market</i>	1.029 (1.644)	0.770 (2.293)
<i>Cash reserves</i>	-0.268** (0.129)	0.156 (0.156)
<i>Tobin's Q</i>	0.0170 (0.0119)	-0.008 (0.018)
<i>Prior cross-border experience</i>	0.212*** (0.0331)	0.166*** (0.045)
<i>Variance of historical Returns</i>	-0.503 (0.400)	-0.303 (0.550)
<i>Acquisition Activity Index</i>	-0.947** (0.439)	-1.056 (0.661)
<b><i>Acquiring CEO characteristics</i></b>		
<i>CEO overconfidence</i>	-0.00977 (0.0314)	0.0663 (0.0424)
<i>CEO tenure</i>	-0.006*** (0.002)	-0.009*** (0.003)
<i>CEO age</i>	-0.007*** (0.002)	-0.0006 (0.003)
<i>female</i>	-0.331*** (0.110)	-0.083 (0.116)
Year and Industry FE	Yes	Yes
Pseudo R <sup>2</sup>	0.0818	0.0781
Number of Observations	11 246	6 344

**Table 10: The role of corporate governance regarding cross-border M&A deals**

The table presents the estimates of a probit regression with clustered standard errors at firm level where the dependent variable takes the value of 1 if a firm has engaged in a cross-border acquisition during each of the years 1996 till 2019, and zero otherwise. The sample period is between January 1, 1996 and December 31, 2019 for the universe of US publicly listed firms with data on ExecuComp. See Appendix A for definitions of variables. All independent variables are lagged with respect to the dependent variable. All variables are winsorized at the 1% on both tails, with the exception of binary variables. Heteroscedasticity-robust clustered standard errors at firm level are reported in brackets. The symbols \*, \*\* and \*\*\* denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1) Probit	(2) Probit	(3) Probit
<b><i>Variable of Interests</i></b>			
<i>Scaled Vega</i>	0.334** (0.156)	0.334** (0.156)	0.313** (0.155)
<i>Scaled Delta</i>	-0.020** (0.009)	-0.020** (0.009)	-0.019** (0.009)
<i>Scaled Cash compensation</i>	-0.034 (0.060)	-0.033 (0.060)	-0.029 (0.061)
<b><i>Acquiring firm control variables</i></b>			
<i>Firm size</i>	0.083*** (0.011)	0.083*** (0.011)	0.081*** (0.011)
<i>Book to market</i>	0.392 (1.377)	0.392 (1.377)	0.671 (1.391)
<i>Debt ratio</i>	0.113 (0.078)	0.113 (0.078)	0.130 (0.079)
<i>Cash reserves</i>	-0.128 (0.102)	-0.128 (0.102)	-0.113 (0.103)
<i>Tobin's Q</i>	0.009 (0.010)	0.009 (0.010)	0.011 (0.010)
<i>Prior cross-border experience</i>	0.214*** (0.027)	0.214*** (0.027)	0.209*** (0.027)
<i>Variance of historical Returns</i>	-0.330 (0.344)	-0.329 (0.344)	-0.241 (0.353)
<i>Acquisition Activity Index</i>	-0.612** (0.282)	-0.613** (0.282)	-0.596** (0.283)
<b><i>Acquiring CEO characteristics</i></b>			
<i>CEO overconfidence</i>	0.015 (0.025)	0.015 (0.025)	0.015 (0.026)
<i>CEO tenure</i>	-0.006*** (0.001)	-0.006*** (0.001)	-0.006*** (0.001)
<i>CEO age</i>	-0.005*** (0.001)	-0.005*** (0.001)	-0.005*** (0.001)
<i>female</i>	-0.216*** (0.080)	-0.215** (0.080)	-0.214*** (0.080)
<b><i>Acquiring Governance Characteristics</i></b>			
<i>Independent directors</i>	0.023 (0.090)	0.021 (0.091)	0.040 (0.094)
<i>Board Size</i>	-0.006 (0.005)	-0.006 (0.005)	-0.005 (0.005)
<i>CEO/Chairman duality</i>		0.007 (0.025)	0.009 (0.026)
<i>Dual class firm</i>			-0.024 (0.047)
Year & Industry FE	Yes	Yes	Yes
Pseudo R <sup>2</sup>	0.0769	0.0769	0.0762
Number of Observations	16 604	16 604	16 222

**Table 11: The role of corporate governance regarding cross-border M&A deals**

The table presents the estimates of an OLS regression with clustered standard errors at firm level where the dependent variable takes the value of 1 if a firm has engaged in a cross-border acquisition during each of the years 1996 till 2019, and zero otherwise. The sample period is between January 1, 1996 and December 31, 2019 for the universe of US publicly listed firms with data on ExecuComp. See Appendix A for definitions of variables. All independent variables are lagged with respect to the dependent variable. All variables are winsorized at the 1% on both tails, with the exception of binary variables. Heteroscedasticity-robust clustered standard errors at firm level are reported in brackets. The symbols \*, \*\* and \*\*\* denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	(1) OLS	(2) OLS	(3) OLS	(4) OLS
<b>Variable of Interests</b>				
<i>Scaled Vega</i>	0.319*	0.441**	0.558**	0.498*
	(0.193)	(0.223)	(0.250)	(0.263)
<i>Scaled Delta</i>	-0.009	0.008	-0.023	-0.001
	(0.010)	(0.015)	(0.023)	(0.024)
<i>Vega X Indep.Directors</i>	-0.340	-0.520*	-0.564*	-0.593*
	(0.270)	(0.290)	(0.322)	(0.339)
<i>Delta X Indep.Directors</i>	0.005	0.011	0.004	-0.002
	(0.016)	(0.017)	(0.018)	(0.018)
<i>Vega X CEO/Chairman</i>		-0.023	-0.039	0.011
		(0.104)	(0.103)	(0.105)
<i>Delta X CEO/Chairman</i>		-0.021*	-0.017	-0.035**
		(0.012)	(0.013)	(0.013)
<i>Vega X Board Size</i>			-0.008	-0.007
			(0.021)	(0.021)
<i>Delta X Board Size</i>			0.003**	0.003**
			(0.001)	(0.001)
<i>Vega X Dual class firm</i>				0.106
				(0.284)
<i>Delta X Dual class firm</i>				-0.039***
				(0.012)
<i>Scaled Cash compensation</i>	-0.004	-0.006	-0.005	-0.004
	(0.016)	(0.016)	(0.016)	(0.017)
<b>Firm control variables</b>				
<i>Firm size</i>	0.022***	0.022***	0.023** *	0.023***
	(0.003)	(0.003)	(0.003)	(0.003)
<i>Book to market</i>	0.201	0.231	0.210	0.270
	(0.347)	(0.347)	(0.346)	(0.353)
<i>Debt ratio</i>	0.031	0.031	0.032	0.036
	(0.022)	(0.022)	(0.022)	(0.023)
<i>Cash reserves</i>	-0.051*	-0.052*	-0.052*	-0.049*
	(0.028)	(0.028)	(0.028)	(0.029)
<i>Tobin's Q</i>	0.003	0.003	0.003	0.004
	(0.003)	(0.003)	(0.003)	(0.003)
<i>Prior cross-border experience</i>	0.070***	0.070***	0.070** *	0.067***
	(0.008)	(0.008)	(0.008)	(0.008)
<i>SD Historical Returns</i>	-0.090	-0.085	-0.097	-0.075
	(0.092)	(0.092)	(0.093)	(0.096)
<i>Acquisition Activity Index</i>	-0.139**	-0.140**	-0.140**	-0.136**
	(0.068)	(0.068)	(0.068)	(0.069)
<b>CEO characteristics</b>				

<i>CEO overconfidence</i>	0.004 (0.007)	0.004 (0.007)	0.003 (0.007)	0.002 (0.007)
<i>CEO tenure</i>	-0.001*** (0.005)	-0.001*** (0.005)	- 0.001*** (0.005)	-0.001*** (0.005)
<i>CEO age</i>	-0.001*** (0.005)	-0.001** (0.005)	-0.001** (0.005)	-0.001** (0.005)
<i>female</i>	-0.052** (0.021)	-0.052** (0.021)	-0.052** (0.021)	-0.053** (0.021)
<b><i>Governance Characteristics</i></b>				
<i>Independent directors</i>	0.022 (0.026)	0.028 (0.027)	0.033 (0.027)	0.041 (0.028)
<i>CEO/Chairman duality</i>		0.006 (0.007)	0.007 (0.007)	0.009 (0.008)
<i>Board Size</i>			-0.002 (0.001)	-0.001 (0.001)
<i>Dual class firm</i>				0.002 (0.017)
Year & Industry FE	Yes	Yes	Yes	Yes
Pseudo R <sup>2</sup>	0.0781	0.0785	0.0788	0.0787
Number of Observations	16 752	16 752	16 752	16 359

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**Table 12: risk-taking incentives and prior international experience.**

The table presents the estimates of a probit regression with clustered standard errors at firm level where the dependent variable takes the value of 1 if a firm has engaged in a cross-border acquisition during each of the years 1996 till 2019, and zero otherwise. The sample period is between January 1, 1996 and December 31, 2019 for the universe of US publicly listed firms with data on ExecuComp. See Appendix A for definitions of variables. All independent variables are lagged with respect to the dependent variable. All variables are winsorized at the 1% on both tails, with the exception of binary variables. Heteroscedasticity-robust clustered standard errors at firm level are reported in brackets. The symbols \*, \*\* and \*\*\* denote statistical significance at the 10%, 5%, and 1% levels, respectively. (2) reports the results when we only include firms that have low international experience (foreign sales ratio below the sample mean). (3) reports the results when we only include firms that have high international experience (foreign sales ratio beyond the sample mean).

<i>Probability of cross-border M&amp;A</i>	(1) Full sample	(2) Low international experience	(3) High international experience
<b><i>Variable of Interests</i></b>			
<i>Scaled Vega</i>	0.278** (0.141)	1.095*** (0.265)	-0.174 (0.154)
<i>Scaled Delta</i>	-0.017** (0.008)	-0.076** (0.033)	0.002 (0.009)
<i>Scaled Cash compensation</i>	0.012 (0.050)	-0.133 (0.090)	0.288*** (0.069)
<b><i>Acquiring firm control variables</i></b>			
<i>Firm size</i>	0.081*** (0.009)	0.071*** (0.019)	0.055*** (0.012)
<i>Book to market</i>	0.110* (0.065)	-2.043 (1.905)	1.579 (1.765)
<i>Debt ratio</i>	-0.922 (1.095)	-0.100 (0.120)	0.218** (0.089)
<i>Cash reserves</i>	-0.118 (0.085)	-0.089 (0.166)	-0.627*** (0.114)
<i>Tobin's Q</i>	0.008 (0.009)	0.051*** (0.019)	0.017 (0.012)
<i>Prior cross-border experience</i>	0.195*** (0.024)		
<i>Variance of historical Returns</i>	-0.235 (0.269)	-2.144*** (0.510)	-0.488 (0.395)
<i>Acquisition Activity Index</i>	-1.086*** (0.326)	-1.067** (0.542)	-0.478 (0.475)
<b><i>Acquiring CEO characteristics</i></b>			
<i>CEO overconfidence</i>	0.005 (0.022)	-0.032 (0.042)	0.039 (0.030)
<i>CEO tenure</i>	-0.007*** (0.001)	0.0002 (0.003)	-0.010*** (0.002)
<i>CEO age</i>	-0.004** (0.001)	-0.001 (0.003)	-0.007*** (0.002)
<i>female</i>	-0.192*** (0.068)	-0.096 (0.124)	-0.159* (0.093)
Year & Industry FE	Yes	Yes	Yes
Pseudo R <sup>2</sup>	0.0788	0.0795	0.0363
Number of Observations	21 266	15 131	6 135



**Table 13: Tests of Differences for CARs [-1, +1]**

The table presents tests of differences in means and medians. The statistical significance of the difference in mean and in medians, for each dependent variable are indicated by \*, \*\* and \*\*\* for 10%, 5%, and 1% level of significance, respectively. All variables are defined in the appendix.

CARs [-1, +1]	Full sample	Domestic	Cross-Border	Difference
<b><u>Market Model</u></b>				
Mean	0.0042	0.0045	0.0028	0.0017**
Median	0.0022	0.0024	0.0018	0.0006*
<b><u>Adjusted Market Model</u></b>				
Mean	0.0053	0.0056	0.0042	0.0014*
Median	0.0032	0.0033	0.0028	0.0005*

**Table 14: Risk-taking incentives and bidder 3-day CARs**

The table presents the estimates of OLS regressions with clustered errors at firm level of bidder 5-day cumulative abnormal returns (CARs) over the event window (-1, +1) around the acquisition announcement over the period between January 1, 1996 and December 31, 2019 for the universe of US publicly listed firms with data on Exec Comp. See Appendix A for definitions of variables. Heteroscedasticity-robust clustered standard errors at firm level are reported in brackets. The symbols \*, \*\* and \*\*\* denote statistical significance at the 10%, 5%, and 1% levels, respectively. Note that this regression concerns the restricted sample including only firms that engaged in M&A deals. (1) is for the full sample, (2) includes only domestic deals and (3) includes exclusively Cross-Border deals.

CARs [-1, +1]	(1) Full sample	(2) Domestic	(3) Cross-border
<b><i>Variable of Interests</i></b>			
<i>Scaled Vega</i>	0.009* (0.005)	0.009* (0.005)	0.012 (0.008)
<i>Scaled Delta</i>	-0.0003 (0.0002)	-0.0003 (0.0002)	-0.0006 (0.0004)
<i>Scaled Vega X CBorder</i>	0.003 (0.010)		
<i>Scaled Delta X CBorder</i>	-0.004 (0.005)		
<i>Scaled Cash compensation</i>	0.003 (0.002)	0.005** (0.002)	-0.001 (0.004)
<b><i>Acquiring firm Characteristics</i></b>			
<i>Market Value</i>	-0.001*** (0.0004)	-0.001*** (0.0004)	-0.002*** (0.0007)
<i>Debt ratio</i>	0.002 (0.004)	0.004 (0.006)	-0.0005 (0.005)
<i>Cash reserves</i>	-0.005 (0.004)	-0.004 (0.005)	-0.006 (0.008)
<i>Firm Age</i>	0.0001 (0.0002)	0.0003 (0.0003)	0.00003 (0.0003)
<i>Same industry</i>	0.001 (0.001)	0.0005 (0.001)	0.002 (0.001)
<i>Tobin's Q</i>	0.0001 (0.0005)	0.0001 (0.0005)	-0.0001 (0.0008)
<i>Annualized return volatility</i>	0.193 (0.208)	0.263 (0.264)	-0.058 (0.151)
<i>Acquisition Activity Index</i>	0.002	0.006	-0.011

	(0.013)	(0.014)	(0.025)
<i>Acquiring CEO characteristics</i>			
<i>CEO age</i>	-0.002 (0.003)	-0.002 (0.004)	-0.0001 (0.007)
<i>Female</i>	0.001 (0.002)	0.0007 (0.003)	0.001 (0.004)
<i>Overconfidence</i>	0.0005 (0.001)	-0.0003 (0.001)	0.003** (0.001)
<i>Deal characteristics</i>			
<i>Completed</i>	-0.0008 (0.001)	-0.0002 (0.001)	-0.002 (0.002)
<i>Hostile</i>	-0.002 (0.002)	-0.0009 (0.002)	-0.002 (0.003)
<i>Stock payment</i>	-0.002 (0.002)	-0.003 (0.002)	0.002 (0.006)
<i>Cross-Border</i>	-0.002* (0.001)		
<i>Number of Target Advisors</i>	0.001* (0.0008)	0.001 (0.001)	0.001 (0.001)
<i>Compete dummy</i>	-0.002 (0.004)	-0.001 (0.005)	-0.007 (0.007)
<i>Public Target</i>	0.0004 (0.001)	-0.0003 (0.002)	0.004 (0.003)
<i>Tender offer</i>	0.0001 (0.002)	-0.0006 (0.003)	-0.001 (0.005)
<i>Horizontal merger</i>	0.001 (0.001)	0.0005 (0.001)	0.002 (0.001)
<i>Termination fee</i>	-0.004* (0.002)	-0.002 (0.002)	-0.009 (0.014)
Year FE	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Adjusted R <sup>2</sup>	0.057	0.014	0.024
Number of Observations	21 153	16 364	4 789

**Table 15: Tests of Differences for accounting performance.**

The table presents tests of differences in means and medians of accounting performance measures. The statistical significance of the difference in mean, for each dependent variable are indicated by \*, \*\* and \*\*\* for 10%, 5%, and 1% level of significance, respectively. All variables are defined in the appendix.

Accounting measures	Full sample			Domestic			Cross-border		
	Pre-acquisition	Post-acquisition	Difference	Pre-acquisition	Post-acquisition	Difference	Pre-acquisition	Post-acquisition	Difference
<b>ROA</b>									
Mean	0.140	0.130	-0.010***	0.139	0.130	-0.009***	0.143	0.132	-0.011***
Median	0.134	0.127	-0.007***	0.133	0.126	-0.007***	0.137	0.129	-0.008***
<b>Tobin's Q</b>									
Mean	1.599	1.373	-0.226***	1.572	1.349	-0.223***	1.693	1.458	-0.235***
Median	1.160	1.016	-0.144***	1.133	0.989	-0.144***	1.262	1.122	-0.140***
<b>ROE</b>									
Mean	0.042	0.018	-0.024***	0.042	0.019	-0.023***	0.040	0.014	-0.026***
Median	0.046	0.046	0	0.047	0.046	-0.001***	0.046	0.045	-0.001***
<b>ROI</b>									
Mean	0.094	0.071	-0.023***	0.092	0.070	-0.022***	0.098	0.075	-0.023***
Median	0.088	0.077	-0.011***	0.087	0.076	-0.011***	0.091	0.081	-0.010***

**Table A1: Papers related to our paper.**

Number	Paper	Year	Authors	Journal	Research question	Sample	Period
1	Managerial incentives and risk-taking	2006	Coles, Naveen and Naveen	Journal of Financial Economics	What is the relationship between managerial compensation, investment policy, debt policy and firm risk? (Causal relation, effect of Vega and Delta on Investment policy, and the effect of riskier policy choices on compensation structures- Vega and Delta)	Sample composed of 1500 firms from a variety of industries	1992-2002
2	The accentuated CEO career horizon problem: Evidence from international acquisitions	2008	Elie Matta and Paul Beamish	Strategic Management Journal	How does the career horizon of a CEO affect a firm's engagement in international acquisitions?	293 U.S firms, no mention of number of observations	1995-1999
3	Do CEOs gain more in foreign acquisitions than domestic acquisitions?	2012	Neslihan Ozkan	Journal of Banking and Finance	Why do CEOs pursue foreign acquisitions?	147 completed bids by U.K firms	1999-2005
4	Do risk-taking incentives induce CEOs to invest? Evidence from acquisitions.	2015	Croci and Petmezas	Journal of corporate Finance	Do risk-taking incentives induce CEOs to carry out an acquisition deal?	Sample composed of 3144 firms, of which 2056 are M&A bidders that conducted 9789 acquisitions.	1996-2011
5	Takeovers and (excess) CEO compensation	2017	Isabel Feito-Ruiz Luc Renneboog	Journal of International Financial Markets, Institutions & Money	Does CEO equity-compensation (LTIPs and stock options) have a positive effect on the bidder's shareholder valuation when an M&A is announced?	216 M&As involving firms from 26 countries	2002-2007
6	Gold for now and the golden years: Effects of CEO stock options and retirement pay on cross-border acquisitions	2018	Krista Lewellyn	Journal of Strategy and Management	What is the impact of CEO stock options and retirement pay on cross-border acquisitions?	1040 firm/year observations, 136 bidder firms	2006-2016
7	Managerial Risk-taking incentives and merger decisions	2019	Chen Lin, Micah Officer and Beibei Shen	Journal of Financial and Quantitative Analysis	What is the impact of the risk-taking incentives of CEOs on M&A decisions?	5562 firm/year observations	2006-2011

**Table A2: Papers with large M&A samples.**

Number	Paper	Year	Authors	Journal	Research question	Filters	Sample	Period
1	Determinants of Cross-Border Mergers and Acquisitions	2012	Erel, Liao and Weisbach	Journal of Finance	To which extent international factors influence the decision of firms to merge?	<ul style="list-style-type: none"> <li>- Deals Announced between 1990 and 2007 and completed by the end of 2007.</li> <li>- Exclude LBOs, spin-offs, recapitalizations, self-tender offers, exchange offers, repurchases, partial equity stake purchases, acquisitions of remaining interest, privatizations, as well as deals in which the target or the acquirer is a government agency or in the financial or utilities industry.</li> <li>- Exclude deals from countries with incomplete stock market data between 1990 and 2007.</li> </ul>	Sample of 187 841 mergers covering 48 countries with a total transaction value of \$7.54 trillion: of which 56 978 (30%) are cross-border mergers with a total transaction value of \$2.21 trillion. 80% of completed cross-border deals between 1990-2007 targeted a non-US firm, and 75% of the acquirers are from outside the United States.	1990-2007
2	Implications of Data Screens on Merger and Acquisition Analysis: A large sample study of mergers and acquisitions from 1992 to 2009	2011	Netter, Stegemoller and Wintoki	The Review of Financial Analysis	They present data that are more representative of the characteristics of M&As and provide evidence on the extent to which some conclusions of the prior literature hold true in the larger sample.	<ul style="list-style-type: none"> <li>- All acquisitions from 01/01/1992 to 12/31/2009</li> <li>- Disclosed and Undisclosed deal value Mergers and Acquisitions</li> <li>- Deal Status is "Completed"</li> <li>- Percentage of Shares Acquired in Transaction: 50 to HI</li> <li>- Percentage of Shares Held by Acquirer Six Months Prior to Announcement: 0 to 49.</li> </ul>	311 894 transactions with available deal values totaling over \$32 trillion. When they filter by U.S Acquirers, they are left with 128 900 transactions. The mean number of cross-border deals is 20% and the range is 16% to 23%.	1992-2009
3	Globalization, governance and the returns to cross-border acquisitions.	2011	Ellis, Moeller, Schlingemann and Stulz	NBER working paper	How does a country's governance affect the extent to which investments create wealth for shareholders?	<ul style="list-style-type: none"> <li>-Deals completed between 1990-2007</li> <li>- The acquirer owns less than 50% of the target before the acquisition and more than 50% afterwards.</li> <li>- Public acquirers</li> <li>- Only include public, private targets and subsidiary and exclude spin-offs, recaps, buybacks, self-tenders or exchange offers.</li> </ul>	37 414 M&As by firms in 61 countries from 1990 to 2007: 8090 are cross-border acquisitions (22%).	1990-2007

4	Markets Talk, Firms Listen: The Dynamics of Repeat Acquirers	2007	Kenneth Ahern	Working paper	Do markets anticipate future acquisition returns? Do firms adjust current M&A activities based on the returns of prior deals?	<ul style="list-style-type: none"> <li>- Exclude all deals where the value of the transaction reported by SDC is less than 1% of the acquiring firm's market of equity two days before the announcement.</li> <li>- Acquisitions worth at least \$1 million announced between 01/01/1980 and 12/23/2004 that were completed within 1000 days.</li> <li>- No restriction on relative value of the target to the acquirer.</li> <li>- Acquirers have to own less than 50% of the target before the acquisition and 100% after the acquisition.</li> <li>- Public acquirers with data on CRSP and COMPUSTAT.</li> <li>- Targets are restricted to public, private or subsidiaries of a public or private firm.</li> <li>- Multiple acquisition announcements by the same firm within five days of each other are excluded.</li> </ul>	12 942 acquisitions made by 4 879 acquirers.	1980-2004
5	Firm size and the gains from acquisitions	2004	Moeller, Schlingemann and Stulz	Journal of Financial Economics	Do smaller acquirers gain more in announced acquisitions?	<ul style="list-style-type: none"> <li>- Domestic M&amp;As with announcement dates between 1980 and 2001</li> <li>- The transaction is completed</li> <li>- The deal value is greater than \$1 million.</li> <li>- A public or private U.S firm or a non-public subsidiary of a public or private firm are acquired.</li> <li>- The acquirer is a public firm listed on CRSP and COMPUSTAT.</li> <li>- The deal value relative to the market value of the acquirer is less than 1%.</li> </ul>	12 023 domestic acquisitions made by U.S firms.	1980-2001

**Table A3: Probability of engaging in M&A negotiations (replication of Croci and Petmezas, 2015)**

The table presents the estimates of a probit regression with clustered standard errors at firm level where the dependent variable takes the value of 1 if a firm has engaged in an M&A negotiation, 0 otherwise. The sample period is between January 1, 1996 and December 31, 2019 for the universe of US publicly listed firms with data on ExecuComp. See Appendix A for definitions of variables. All independent variables are lagged with respect to the dependent variable. Heteroscedasticity-robust clustered standard errors at firm level are reported in brackets. The symbols \*, \*\* and \*\*\* denote statistical significance at the 10%, 5%, and 1% levels, respectively.

	Probability of engaging in M&A negotiations		
	(1) Probit	(2) Probit	(3) Probit
<i>Variable of Interests</i>			
<i>Vega</i>	0.054*** (0.009)		0.024** (0.010)
<i>Delta</i>		0.089*** (0.014)	0.074*** (0.016)
<i>Cash compensation</i>	0.016*** (0.022)	0.025 (0.020)	0.022 (0.021)
<i>Firm control variables</i>			
<i>Size</i>	0.210*** (0.016)	0.192*** (0.017)	0.188*** (0.017)
<i>Leverage</i>	-0.406*** (0.089)	-0.388*** (0.089)	-0.390*** (0.089)
<i>Cash reserves</i>	0.033 (0.114)	-0.015 (0.115)	-0.029*** (0.115)
<i>Cash flows</i>	0.774*** (0.167)	0.722*** (0.161)	0.722*** (0.163)
<i>Book to market</i>	-0.141 (0.149)	-0.138 (0.133)	-0.129 (0.130)
<i>Tobin's Q</i>	0.010 (0.008)	0.002 (0.008)	0.0004 (0.009)
<i>Acq Activity Index</i>	0.892*** (0.251)	0.929*** (0.251)	0.893*** (0.251)
<i>CEO characteristics</i>			
<i>Overconfidence</i>	0.236*** (0.028)	0.161*** (0.028)	0.177*** (0.029)
<i>CEO tenure</i>	0.003 (0.002)	-0.001 (0.002)	-0.007 (0.002)
<i>CEO age</i>	-0.009*** (0.002)	-0.009*** (0.002)	-0.009*** (0.002)
<i>female</i>	-0.228*** (0.075)	-0.204*** (0.075)	-0.209*** (0.075)
Year & Industry FE	Yes	Yes	Yes
Pseudo R <sup>2</sup>	0.1419	0.1430	0.1438
Number of Observations	34 978	35 071	34 978

**Table A4: Correlation Matrix of the main variables of the wider sample**

This table reports correlations of our main variables in the sample.

Note that the \* shows significance at the .01 level

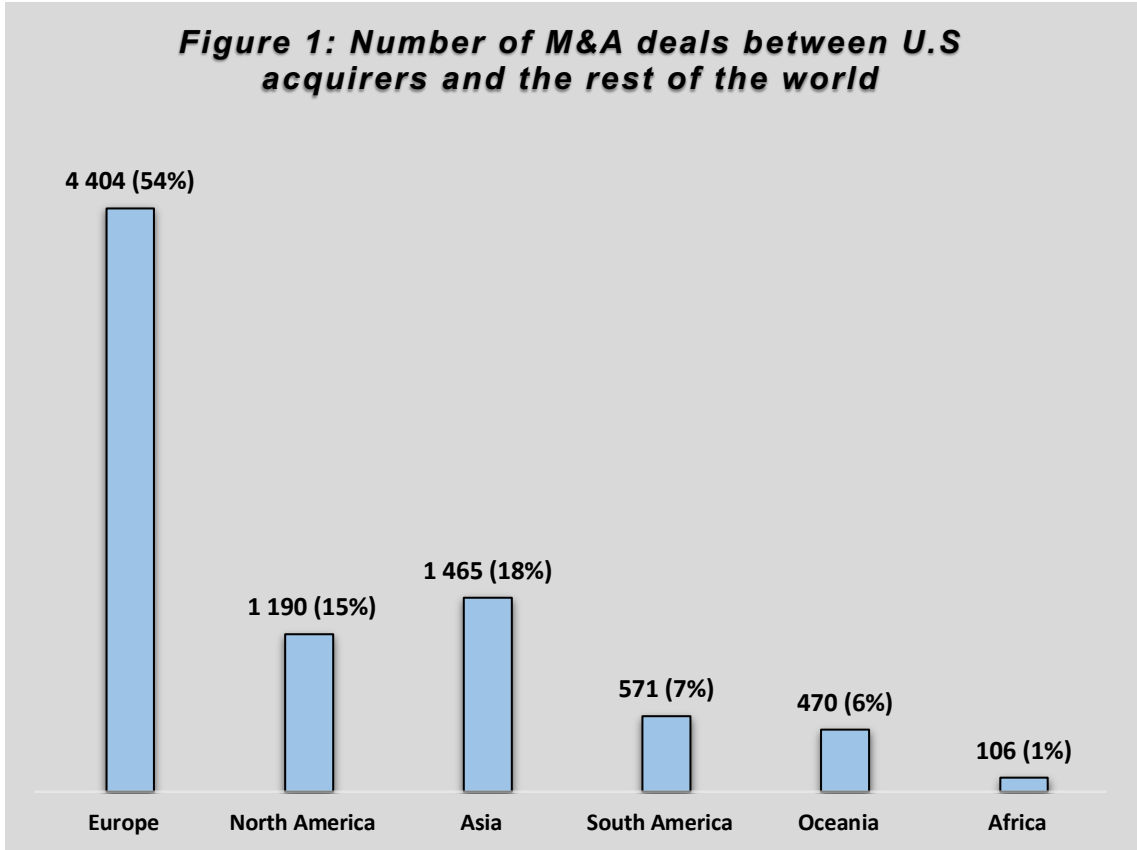
Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	
(1) CBorder	1.000																								
(2) delta	0.007	1.000																							
(3) vega	<b>0.036*</b>	0.285*	1.000																						
(4) Stockportfolio	0.004	0.999*	0.259*	1.000																					
(5) Optionportfolio	<b>0.015*</b>	0.294*	0.386*	0.120*	1.000																				
(6) CEOwealth	0.006	1.000*	0.274*	1.000*	0.288*	1.000																			
(7) Cashcomp.	<b>0.075*</b>	-0.008	0.226*	-0.029*	0.149*	-0.012	1.000																		
(8) Equitycomp.	<b>0.056*</b>	0.184*	0.545*	0.066*	0.457*	0.178*	0.250*	1.000																	
(9) Optioncomp.	<b>0.024*</b>	0.205*	0.543*	0.080*	0.500*	0.199*	0.163*	0.869*	1.000																
(10) Totalcomp.	<b>0.065*</b>	0.174*	0.553*	0.058*	0.457*	0.167*	0.391*	0.989*	0.851*	1.000															
(11) Shares	0.006	0.772*	0.403*	0.405*	0.322*	0.769*	-0.019*	0.229*	0.247*	0.213*	1.000														
(12) Completed	<b>0.094*</b>	0.005	0.007	0.000	0.016*	0.005	-0.025*	-0.008	0.020*	-0.012	0.012	1.000													
(13) age	0.023*	0.013	0.064*	0.007	0.002	0.012	0.081*	0.034*	-0.005	0.044*	0.010	-0.019*	1.000												
(14) Size	0.152*	0.114*	0.351*	0.115*	0.168*	0.109*	0.378*	0.337*	0.158*	0.378*	0.123*	-0.070*	0.151*	1.000											
(15) cashflows	-0.001	0.062*	0.057*	0.035*	0.068*	0.061*	0.001	0.030*	0.018*	0.029*	0.074*	-0.045*	0.036*	0.113*	1.000										
(16) B/M	-0.034*	-0.019*	-0.061*	0.072*	-0.040*	-0.018*	-0.060*	-0.068*	-0.039*	-0.074*	-0.021*	-0.006	0.013	-0.170*	-0.010	1.000									
(17) market_cap	0.094*	0.276*	0.283*	0.287*	0.221*	0.272*	0.264*	0.280*	0.171*	0.307*	0.258*	-0.043*	0.014*	0.533*	0.105*	-0.056*	1.000								
(18) CAPEX	-0.016*	-0.037*	-0.048*	-0.006	-0.011	-0.036*	0.017*	-0.026*	0.007	-0.022*	-0.030*	-0.045*	-0.048*	-0.023*	0.105*	-0.021*	-0.019*	1.000							
(19) Leverage	0.016*	-0.050*	-0.008	-0.038*	-0.021*	-0.051*	0.091*	0.033*	-0.027*	0.045*	-0.052*	0.016*	0.049*	0.120*	-0.127*	-0.059*	-0.017*	0.063*	1.000						
(20) Cashreserves	0.020*	0.138*	0.078*	0.099*	0.106*	0.138*	-0.049*	0.079*	0.095*	0.067*	0.161*	-0.054*	-0.158*	-0.129*	-0.007	-0.027*	0.133*	-0.105*	-0.342*	1.000					
(21) Eindex	-0.040*	-0.134*	-0.119*	-0.124*	-0.123*	-0.133*	-0.178*	-0.086*	-0.138*	-0.108*	-0.115*	-0.010	0.016	-0.129*	-0.036*	0.018*	-0.265*	-0.079*	0.027*	-0.107*	1.000				
(22) dualclass	-0.001	0.020*	-0.022*	0.067*	-0.018*	0.021*	0.022*	-0.008	-0.000	-0.004	0.004	-0.006	0.025*	-0.005	-0.002	0.025*	-0.027*	-0.003	0.034*	-0.039*	0.066*	1.000			
(23) Indep.direct.	0.045*	-0.056*	0.113*	-0.056*	0.019*	-0.058*	0.129*	0.116*	0.003	0.131*	-0.034*	-0.066*	0.106*	0.439*	0.008	-0.129*	0.228*	-0.122*	0.089*	-0.119*	0.160*	-0.113*	1.000		
(24) CEO/Chair	0.010	0.033*	0.067*	0.009	0.077*	0.032*	0.118*	0.047*	0.080*	0.063*	0.001	0.015	0.071*	0.062*	-0.007	0.000	0.024*	0.064*	0.044*	-0.072*	-0.137*	-0.002	0.027*	1.000	
(25) Overconfidence	-0.024*	0.065*	-0.063*	0.058*	0.214*	0.065*	0.021*	0.027*	0.053*	0.029*	0.057*	0.031*	-0.021*	-0.082*	0.1240*	-0.032*	0.005	0.084*	-0.026*	0.046*	-0.079*	-0.002	-0.1228*	0.058*	



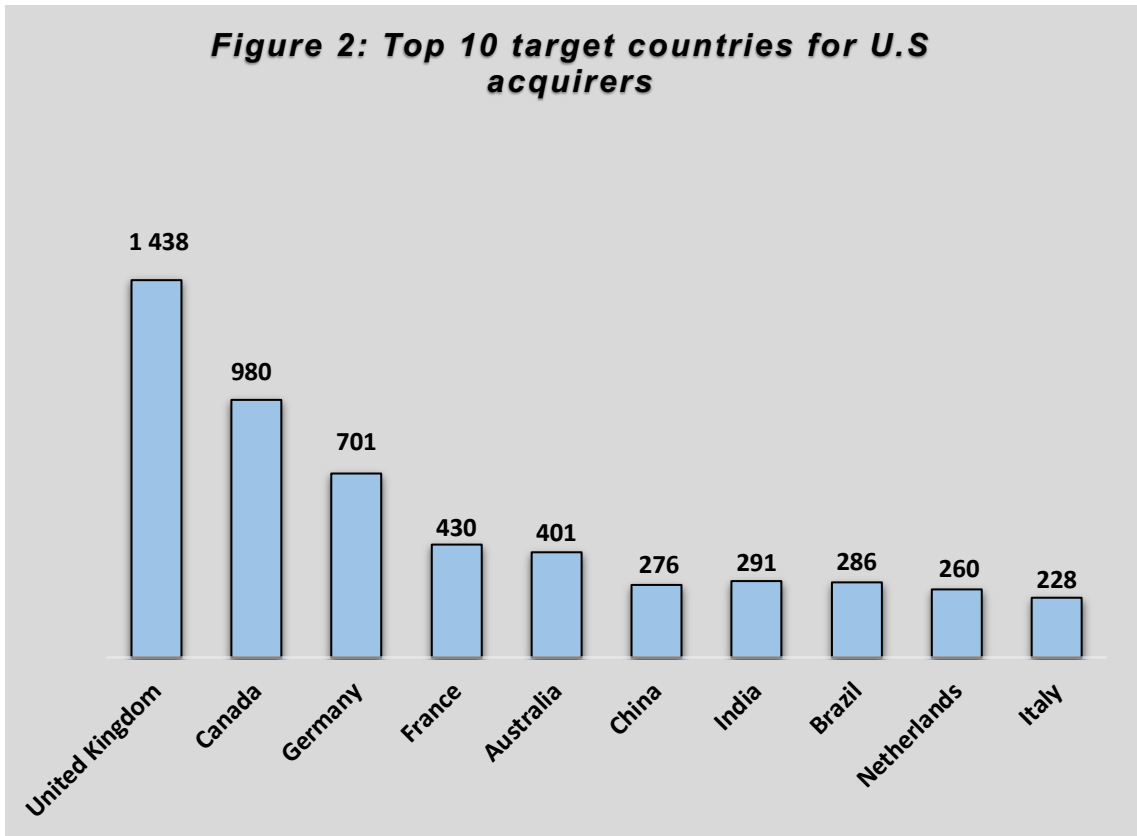


Kazakhstan	3	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
Lebanon	3	0	0	0	0	2	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lithuania	4	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	2	0	0	0	0	0	0	0
Latvia	6	0	2	0	1	0	0	1	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0
Luxembourg	18	1	0	0	0	1	1	0	0	0	2	0	2	0	1	1	1	0	1	1	1	2	1	1
Malaysia	27	0	4	6	1	2	1	0	0	2	0	0	1	1	0	1	0	2	1	3	0	0	1	0
Mongolia	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	
Surinam	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	
Monaco	4	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	1	
Morocco	7	0	0	0	0	0	0	0	0	0	1	0	2	0	0	0	0	0	0	0	1	1	2	
Mexico	169	5	14	12	5	10	10	7	6	9	4	5	3	6	4	5	6	9	9	10	4	4	6	9
Nigeria	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	1	1	0	0	
Norway	102	3	2	4	10	7	2	3	4	0	4	3	5	6	7	7	9	6	3	2	4	8	1	
Netherlands	260	2	10	10	16	5	9	3	12	8	6	8	19	13	9	12	19	15	12	16	15	4	19	
New Zealand	69	1	3	3	4	3	5	1	3	0	1	2	6	3	3	2	4	6	5	2	2	3	4	
Panama	4	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	2	0	0	0	0	
Peru	19	0	1	1	3	1	0	0	1	2	0	0	0	2	1	0	0	2	0	1	2	0	2	
Philippines	20	0	0	0	0	1	1	0	0	3	0	1	5	2	0	1	0	2	0	0	0	1	0	
Pakistan	9	0	1	1	1	1	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	1	
Poland	55	1	4	7	5	2	2	2	0	2	4	2	4	0	2	0	4	2	5	0	0	3	0	
Portugal	31	2	5	1	1	0	0	0	1	1	2	0	2	5	1	1	0	1	1	2	2	1	0	
Slovenia	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	
Puerto Rico	19	1	2	3	3	2	1	0	1	1	0	1	0	0	0	0	0	1	1	0	1	0	1	
Paraguay	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	
Qatar	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Romania	18	0	1	0	1	0	0	1	1	0	0	2	2	3	1	0	0	1	0	0	1	1	2	
Russia	62	0	2	2	1	0	0	2	5	2	2	4	3	5	6	8	4	5	4	1	2	1	1	
South Africa	63	4	3	9	4	6	2	1	3	1	2	0	3	3	1	2	7	1	4	0	2	2	2	
Saudi Arabia	7	0	0	0	0	1	0	0	0	0	0	0	1	2	0	0	0	1	0	1	1	0	0	
Singapore	87	1	3	4	4	6	4	3	2	4	4	3	2	4	5	7	9	1	7	1	3	3	4	
South Korea	122	1	2	21	11	10	5	4	3	11	7	9	4	8	4	2	2	3	2	3	0	2	2	
Spain	163	2	3	6	8	8	2	3	3	8	2	6	5	12	2	10	12	6	6	9	9	10	10	
Slovakia	6	0	0	2	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	2	
Sweden	156	3	6	6	14	11	7	5	3	1	2	14	7	5	7	8	11	10	3	8	6	8	6	
Switzerland	167	0	10	6	6	8	5	5	3	4	6	9	8	8	3	13	7	11	9	11	7	10		
Thailand	25	0	0	4	4	0	1	2	0	1	3	0	3	0	0	2	0	0	0	0	1	1		
Turkey	37	0	0	1	1	0	1	0	0	0	0	2	4	3	0	1	5	3	3	3	4	1		
Tunisia	2	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Taiwan	73	0	2	0	6	7	3	6	3	1	3	6	5	6	6	6	1	4	1	1	0	0		
United Arab Emirates	17	0	0	1	0	1	0	1	0	0	0	0	0	2	0	0	1	4	2	0	0	2		
Ukraine	6	0	0	0	0	0	3	0	0	0	1	0	0	1	1	0	0	0	0	0	0	0	0	
United Kingdom	1438	15	70	98	65	74	45	45	43	60	52	63	70	76	46	61	79	60	61	79	72	67		
Uruguay	7	0	0	2	1	0	1	1	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	
United States	28 781	512	1464	1665	1670	1347	1018	928	1019	1145	1198	1352	1595	1220	844	1158	1362	1312	1182	1392	1283	1161		
Venezuela	11	0	4	2	1	2	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	
Vietnam	15	0	1	3	1	0	0	0	0	0	0	1	0	1	1	1	2	1	1	0	1	0	0	
Germany	701	9	47	51	33	25	21	41	18	33	31	32	32	31	24	23	31	30	23	36	36	34		
Yemen	2	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Zimbabwe	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
<b>Total</b>	<b>36 987</b>	<b>623</b>	<b>1843</b>	<b>2139</b>	<b>2109</b>	<b>1785</b>	<b>1308</b>	<b>1185</b>	<b>1276</b>	<b>1437</b>	<b>1486</b>	<b>1737</b>	<b>2024</b>	<b>1662</b>	<b>1129</b>	<b>1529</b>	<b>1775</b>	<b>1741</b>	<b>1503</b>	<b>1761</b>	<b>1647</b>	<b>1507</b>		

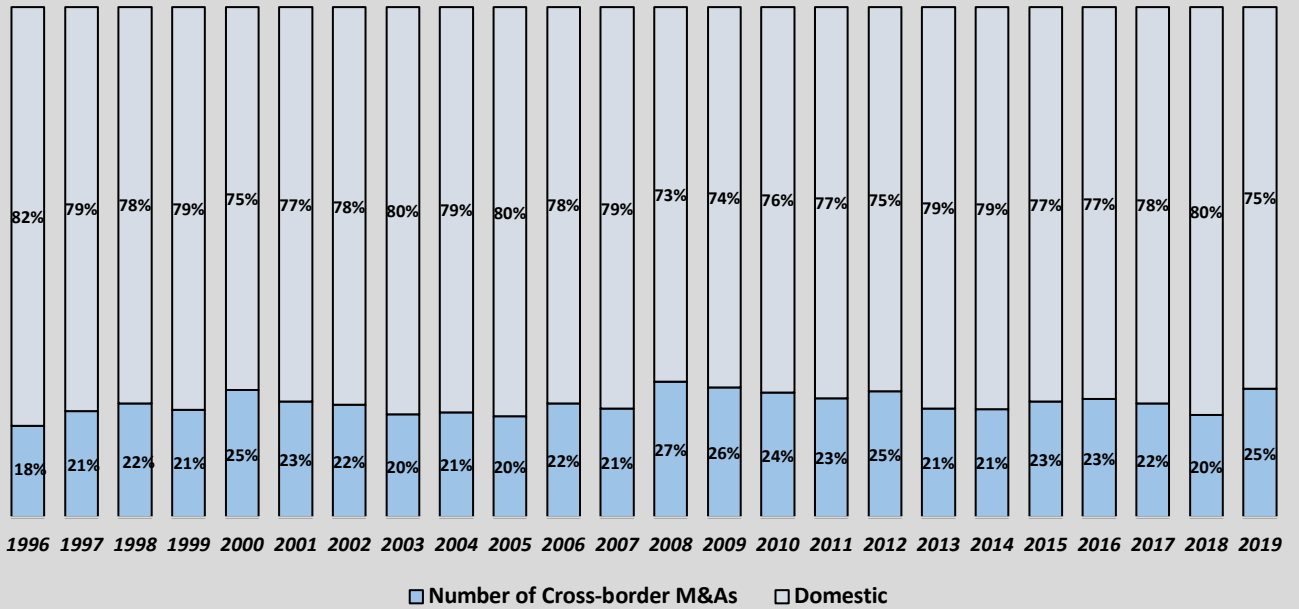
**Figure 1: Number of M&A deals between U.S acquirers and the rest of the world**



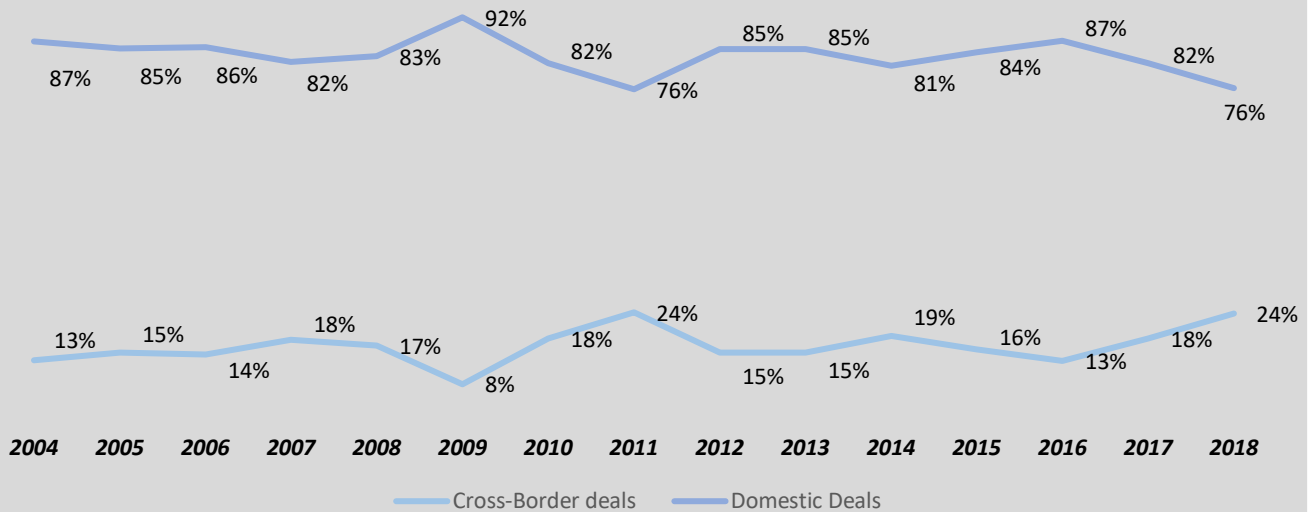
**Figure 2: Top 10 target countries for U.S acquirers**



**Figure 3: Number of cross-border vs Domestic M&As in our sample (1996-2019)**



**Figure 4: U.S acquisitions of domestic and foreign companies (2004-2018)**  
Billions of dollars



<b>Variables</b>	<b>Definition</b>
<b><u>Compensation variables</u></b>	
Total compensation	(ExecuComp data item TDC1). It includes salary, bonus, total value of restricted stock granted, total value of stock options granted (using Black-Scholes), and long-term incentive payouts in the fiscal year t-1.
Cash compensation	(ExecuComp data item TCC). It includes salary and bonus in the fiscal year t-1.
Vega	The change in the dollar value of the CEO wealth for a one percentage change in the annualized standard deviation of stock returns at the end of the fiscal year.
Delta	The change in the dollar value of the CEO wealth for a one percentage point change in stock price at the end of the fiscal year.
Vega Scaled	The dollar change in wealth associated with a one percentage point change in the standard deviation of the firm's returns scaled by total compensation.
Delta Scaled	The dollar change in wealth associated with a one percentage point change in the firm's stock price scaled by total compensation.
<b><u>Firm characteristics variables</u></b>	
Size	Log of sales. Sales represent firm's total sales in the fiscal year from COMPUSTAT.
Book-to-Market	Firm book value of equity divided by market value of equity at the fiscal year-end from COMPUSTAT.
Cash reserves	Cash and short-term investments divided by the book value of total assets at the fiscal year-end from COMPUSTAT.
Debt-ratio	Firm's total financial debt (Long-term debt plus debt in current liabilities) divided by the book value of total assets at the fiscal year-end from COMPUSTAT.
Cash flows	Operating income before depreciation minus interest expenses minus taxes minus preferred dividends minus common dividends, scaled by the book value of total assets in the fiscal year from COMPUSTAT.
CAPEX	Firm's capital expenditures in the fiscal year, scaled by total assets from COMPUSTAT.
Abnormal Return	Buy-and-hold excess stock return over the calendar year defined as $\pi (1 + R_{i,m}) - \pi (1 + R_{p,m})$ , where $R_{i,m}$ and $R_{p,m}$ are the return for firm I and the return of the benchmark portfolio for month m, respectively. Benchmark portfolios are the twenty-five Fama-French value weighted portfolios based on size and book-to-market.
Tobin's Q	Market value of total assets ( $at-ceq + csho \times prcc\_f$ ) divided by book value of total assets.
Market value	The ratio of market capitalization to total assets.

Acq Activity Index Acquirer 2-digit code acquisition activity index: For each industry and year, the variable is calculated as the ratio of total transaction value for all announced acquisitions scaled by the sum of total assets in the same industry.

Variance of historical returns This variable captures the total risk of the firm as it affects the relative riskiness of an international acquisition. It is measured as the total variance of monthly market returns for the firm for the previous 60 months.

### **Deal Characteristics**

Stock payment Binary variable that takes the value of 1 for deals where the method of payment is 100% stock, 0 otherwise (Using SDC Thomson).

Cash payment Binary variable that takes the value of 1 for deals where the method of payment is 100% Cash, 0 otherwise (Using SDC Thomson).

Completed Binary variable that takes the value of 1 if the deal is completed, 0 otherwise (Using SDC Thomson).

Hostile Binary variable that takes a value of 1 for deals defined as hostile or unsolicited by Thomson SDC, 0 otherwise.

Deal value The price paid by the acquirer, based on the target firm's assets and characteristics.

Same Industry Binary variable that takes the value of 1 if the target firm operates in the same industry to the one of the bidder, 0 otherwise. (*Source: SDC Mergers & Corporate Transaction Database*).

Cross-Border Binary variable that takes the value of 1 if the firm had engaged in a cross-border acquisition during each of the years 1996 till 2019, and zero otherwise.

Cross-Border Activity The number of cross-border M&A deals completed by a firm during each of the years 1996 till 2019 following previous studies.

### **Governance Variables**

Independent directors Percentage of independent directors. It is the ratio between the number of independent directors and the board size from RiskMetrics.

DCS Binary variable that takes the value of 1 if the firm is a dual-class shares firm, 0 otherwise. The variable is created using data from RiskMetrics.

CEO/Chairman Binary variable that takes the value of 1 if the roles of CEO and Chairman of the board are not split, 0 otherwise. The variable is created using RiskMetrics.

Board Size Number of directors composing board of directors from RiskMetrics.

### **Accounting measures of M&A performance**

Return on Assets (ROA) Profitability is probably the most talked about measure of business performance. One of the studies found a strong relationship between capital structure and profitability while other established causal relationship with strategic choices adopted by the firms. ROA (net income/total assets), an indicator of profitability was studied extensively to measure M&A performance.

Return on equity (ROE) ROE (net income/book value of shareholders' equity) was another profitability measure in M&A performance studies. Kumar and Rajib (2007) used the term return on net worth (RONW) in their study.

Return on investments (ROI)	Defined as (net operating profit/ net book value of assets), ROI was studied for both pre-acquisition and post-acquisition periods to assess M&A performance.
Return on sales (ROS)	Defined as net income (before interest and tax)/ sales, ROS was studied as a measure of M&A and diversification.
Bidder CARs (-1, +1)	Cumulative abnormal return for the bidding firm in the 3-day event window (-1, +1) where 0 is the announcement day. The returns are calculated using the market model with the market model parameters estimated over the period starting 240 days and ending 41 days prior to the announcement. CRSP value-weighted index return is the market return.

**CEO characteristics:**

Female	Binary variable that takes the value of 1 if the CEO is female, 0 otherwise. The variable is created from the field "Gender" in ExecuComp.
CEO age	Age of the CEO from ExecuComp.
CEO tenure	The difference between year t and the year in which the CEO is appointed from ExecuComp.
Overconfidence	It is a binary variable that takes a value of one if the CEO is considered as overconfident and zero otherwise. We follow Croci and Petmezas (2015) to identify a CEO as being overconfident. "A CEO is overconfident is she postpones the exercise of vested options that are at least 67% in the money. Overconfidence is measured for every sample year. For each CEO-year, the total realizable value of the options is divided by the number of options held by the CEO to determine the average realizable value per option. The strike price is calculated as the fiscal year-end stock price minus the average realizable value. The average moneyness of the options is then calculated as the stock price divided by the estimated strike price minus one. Only the vested options held by the CEO are included in the computation. The variable is created using data from Execucomp."

**International control variables:**

Prior cross-border acquisition experience	A variable equal to one if the acquirer firms have a prior cross-border acquisition experience (Constructed from Thomson's SDC from 1980 to current acquisition date), and zero otherwise.
PriorInternational experience	The ratio of foreign sales to total sales using COMPUSTAT segments.

# Chapter 2

## A textual analysis approach to extracting complete information on compensation comment letters

The work presented in this chapter is co-authored with Helen Bollaert (SKEMA Business School), Timothy King (University of Vaasa) and Florencio Lopez de-Silanes (SKEMA Business School)

In this paper we examine the Audit Analytics (AA) database which provides information related to SEC comment letters. A careful analysis of the AA database reveals three main issues with comment letters related to executive compensation. First, we find that the AA database overlooks some information related to SEC regulations and accounting rules contained in letters. Second, we find that data provided by AA lack accuracy. Third, we find that information is missing because the SEC does not provide full references to rules in some cases. We complete the database by extracting the rules contained in letters and omitted by AA. We also extract key words from comment letter texts using Python and use these to identify rules for which references are lacking. The Python programs enable us to identify 85% of the overlooked content in compensation comment letters. The remaining 15% which do not include specific rules or “key words” referring to rules are manually resolved.



## **2.1 Introduction**

The Securities exchange commission (SEC) states that all investors should have access to basic, accurate and complete information in order to make confident and informed decisions about when or where to invest<sup>33</sup>. To achieve this objective, the SEC issues regulations that require public firms to disclose specific information to the public. Firms interpret these regulations and prepare corporate reports containing the required information. Corporate filings are then reviewed by the Division of Corporation Finance at least once every three years to ensure that the firm is compliant with generally accepted accounting principles and SEC disclosure regulations. After the review, firms can receive a comment letter from the SEC within ten days, requesting some clarifications or additional information in order to better understand the disclosure. Firms are then expected to provide clear responses in sometimes, multiple rounds of correspondence. If firms provide the necessary clarifications and the explanations requested by the SEC, the staff considers that firms' filings comply with the SEC's disclosure requirements. However, the staff may also consider that a public firm's filing does not satisfy SEC regulations in all material aspects. This situation can arise when managers misinterpret SEC requirements or choose not to reveal to the public specific information for some reasons (Bozanic et al. 2017). SEC letters to the firms (UPLOAD) as well as companies' responses (CORRESP) are publicly available on SEC's EDGAR website<sup>34</sup>.

Several papers examine comments made by the SEC related to companies' executive compensation disclosures (Robinson et al. 2011, Laksmana et al. 2012, Yang 2019, Wang et al. 2022). However, none of these papers examine the complete set of rules related to SEC regulations and accounting standards. The purpose of this paper is to detail the construction of a novel dataset containing all the SEC regulations and accounting standards related to executive compensation. We use the Audit Analytics (AA) database as a starting point for our analyses of compensation comment letters (CCL). The database provides letters sent from the SEC to firms (UPLOAD), companies' responses (CORRESP), rules (issue phrases) that the SEC refers to during the review process and a comment letter conversation id (COMMENT LETTER CONVERSATION ID) that comprises the comment letters (UPLOAD) and firms' responses (CORRESP) that relate to a single review. AA also provides data related to firm characteristics, other letter-related information and a firm identifier (CIK) that enables us to link CCL data to other data sources.

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<sup>33</sup> See "How the SEC Protect Investors, Maintains Market Integrity and Facilitates Capital Formation" at <http://www.sec.gov/about/whatwedo.shtml>

<sup>34</sup> Additional information regarding SEC comment letter process can be found in Cunningham and Leidner (2022), pp 1654.

Despite the great usefulness of the data, we find that the information provided is incomplete for several reasons. First, AA overlooks some of the information related to SEC regulations and accounting rules contained in letters. Second, we find that the issue phrases provided by AA lack accuracy in some cases. Third, we find that information is missing because the SEC does not provide full references to rules in some cases. We propose a solution to these issues by developing a methodology that extracts more complete information.

The initial part in this methodology consists of extracting all the rules related to SEC regulations and accounting standards that AA overlooked. This step enables us to resolve two issues related to the AA dataset. First, it allows us to complete the dataset with the rules omitted by AA. Second, it provides more details to the issue phrases included in AA that lack accuracy. The second part involves extracting keywords related to rules for which references are lacking. This computerized content analysis is necessary to analyze the remaining letters that do not mention explicit rules yet addresses specific comments and instructions to firms.

The textual analysis programs enable us to identify 85% of the overlooked content in compensation comment letters. The 15% remaining which do not include specific rules or “key words” referring to rules are resolved using manual content analysis. Our results indicate that SEC targets firms in the manufacturing industry (32%), followed by Finance and Insurance (15%) and information (10%) industries. We also find that 70% of the total issue phrases related to specific rules and sent to firms concern SEC regulations. However, unique issue phrases related to accounting standards represent about 65% of the total number of unique issue phrases in our sample.

The creation of this complete dataset enables us to classify issue phrases in several categories. We construct our categories by examining the detailed definition of every issue phrase and by taking examples of letters including them. We also use academic papers, reports from legal and accounting firms and press releases from the SEC. We construct three types of categories. First, we form categories related to the main compensation components of executives following Murphy (2013) and Edmans et al. (2017). Second, we use legal and accounting reports to develop sub-categories for compensation components. In other words, we further expand the contents of the compensation components category. Third, we design categories related to the informational functions of the letters. That is, categories related to the format, presentation and content of tables, the methodologies employed by firms for measurement, recognition and valuation purposes and finally the justification of compensation policies and/or decisions made related to executive compensation. We find that 48% of the total issue phrases in our sample are associated to the whole compensation package, whereas 43% are linked to stock awards

and stock options. Moreover, we find that three informational functions (format/standardization 90%, content 72% and justification 89%) are mostly related to SEC regulations, whereas methodology (77%) is mostly related to accounting standards. The construction of these categories allows us to investigate what is important for the SEC (analysis provided in paper 3).

Few studies use comment letters related to executive compensation from AA. Robinson et al. (2011) examine compensation-related comment letters after the 2006 reforms. The authors investigate 336 firms whose proxies were reviewed by the SEC and find that the total number of defects in compensation is positively related with excess CEO compensation. They also find no evidence that the public disclosure of compensation-related defects reduces excess CEO compensation. However, the paper focuses exclusively on the initial year of the SEC reviews and on a part of SEC regulations solely omitting defects related to other SEC regulations and accounting standards. Furthermore, the paper classifies the compensation-related defects into only two categories: pay-performance disclosures (*PDEFECT*) and governance disclosures (*GDEFECT*). In a more recent paper, Wang et al. (2022) examine the impact of compensation-related comment letters on the change in CEO excess compensation. The authors find that changes in excess compensation are negatively associated with the number of compensation-related defects identified in comment letters. Similarly, the paper focuses exclusively on SEC regulations and use one additional category (Readability-related defects) to the ones already defined in Robinson et al. (2011).

To our knowledge, this is the first paper that identifies information overlooked by the AA database and proposes a solution to extract more complete information. This paper also contributes to the compensation-comment letter literature by analyzing issue phrases related to accounting standards in addition to those related to SEC regulations. Finally, this paper extends the literature by suggesting new specific classifications of issue phrases that can be useful for future papers related to CCLs.

The remainder of this paper is organized as follows: Section 2.2 provides the background and the literature review, section 2.3 details the construction of the dataset. Section 2.4 reports the descriptive statistics of the sample. Section 2.5 discusses comment letter classifications. Finally, Section 2.6 concludes the study.

## **2.2 Background and Literature review**

In August 2006, companies were required by the SEC to disclose information regarding executive pay packages in their annual proxy statements. These new rules produced 20 000 SEC comment letters and were released for two main reasons. First, the older rules were “out of date and it was time we update them [...] to show the true picture of compensation” (Cox, 2006). The second reason is related to the option-backdating scandal, large payouts and severance packages (Bebchuk, 2006).

These new rules have several additional requirements related to compensation goals, practices, policies and decisions for the top executives and directors<sup>35</sup>. First, the new amendments required a new Compensation Discussion and Analysis (CD&A) section related to Regulation S-K item 402(b). In this section, firms are required to detail the objectives of their compensation programs and list and justify the use of each element of executive compensation. Companies are also asked to describe the formulas applied to determine the amount and explain how each element fits into the overall compensation objectives and affects decisions regarding other elements. Second, firms are instructed to reorganize and streamline tables that include “a clearer and more logical picture of total compensation and its elements for named executive officers”. Tables are required to include current and deferred compensation paid to executives, equity-based holdings such as restricted stocks or options, and retirement and other post-employment compensation including those payable in the event of a change in control. This requirement relates to the other items of Regulation S-K item 402, especially item 402(a and m) (All compensation and Persons covered) item 402(c and n) (summary compensation table), item 402(d) (grants of plan-based awards table), item 402(f and p) (outstanding equity awards at fiscal year-end table), item 402(g) (Option exercises and stock vested table), item 402(h) (Pension benefits), item 402(i) (non-qualified defined contribution and other nonqualified deferred compensation plans), item 402(t) (golden parachute compensation). Third, in addition to the tables required, new rules mandate narrative description “of any additional material factors necessary to an understanding of the information disclosed in tables”. This request is related to item 402(e and o) of Regulation S-K 402 (Narrative disclosure to summary compensation table and grants of plan-based awards table). Four, firms are expected to provide information related to equity-based awards’ valuation methods and assumptions (FAS 123) and measurement and recognition of compensation cost.

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<sup>35</sup> SEC, 2006. « Executive compensation and related party disclosure”, <https://www.sec.gov/rules/proposed/33-8655.pdf>, pp.14-16.

Finally, executive compensation information should have defined captions and be presented in tables of specific formats. Comment letters are sent to firms when the SEC identifies issues that warrant additional disclosure, correction or clarification. The SEC provides assistance to firms by referring to the well-defined previous rules related to SEC regulations and accounting standards in addition to clear demands regarding firms' disclosures. The issuers are then expected to provide additional explanations and information until the SEC is satisfied with the responses received.

Few studies examine the detailed compensation issue phrases included in SEC compensation comment letters. Exceptions include Robinson et al. (2011), Laksmana et al. (2012), Yang (2019) and Wang et al. (2022). Robinson et al. (2011) examine whether excess compensation predicts noncompliance. They find a positive association between CEO excess compensation and the number of compensation defects. The authors also explore the impact of noncompliance on subsequent CEO compensation and find no evidence that it is the case. The analysis is conducted on a sample of 336 firms in 2007. The study is based on detailed critiques (defects) related to SEC regulations sent to firms by the SEC<sup>36</sup>. However, this study has several limitations. First, despite carrying out an interesting study just after the 2006 reforms and working on a sample of firms identified by the SEC, the authors investigate only one year of data (2007). However, executive compensation comment letters increased significantly after 2007, reaching its peak in 2010. With the benefit of an extended time period, we can fill this gap by identifying additional rules and addressing questions they could not. Moreover, the authors exclusively focus on some SEC regulations, which is only part of the full information. Our paper examines all SEC regulations in addition to accounting standards. Furthermore, the authors concentrate mostly on the "Compensation Discussion and Analysis" section as seven out of the total ten defects concern Item 402(b). Our paper sheds light on all SEC regulations and accounting standards including those related to narrative disclosures, summary compensation tables, grant awards tables, retirement benefits, change-in-control, termination arrangements, valuation techniques, methodology and recognition of compensation cost. The authors classify issue phrases into two categories: those related to pay-performance disclosures and governance disclosures. We create more detailed categories related to compensation components and the content of the letters. In another more recent study examining compensation comment letters, Wang et al. (2022) investigate the impact of CCLs on excess CEO compensation. The authors conduct their analysis on a sample of 14 274 firm-year

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<sup>36</sup> Robinson, J.R., Xue, Y., & Yu, Y., 2011. Determinants of disclosure noncompliance and the effect of the SEC review: Evidence from the 2006 mandated compensation disclosure regulations. *The Accounting Review*, 86(4), pp. 1415-1444.

observations during the period going from 2006 to 2017. The authors find that CCLs are negatively associated with changes in excess CEO compensation. In other words, the receipt of a CCL decreases excess CEO compensation in the two-year window following the receipt of a letter. Like Robinson et al. (2011), the authors focus on SEC regulations exclusively. However, they conduct their analysis on a larger sample and thus, a higher number of issue phrases related to SEC regulations. Furthermore, the paper classifies compensation-related defects into three categories: pay-related defects, governance-related defects and readability-related defects. The first two categories are taken from Robinson et al. (2011), whereas the last one relates to the narrative description of tables. Other papers examining compensation issue phrases have exclusively focused on the compensation discussion and analysis (CD&A) section related to Regulation S-K item 402(b) exclusively. Laksmana et al. (2012) investigate the association between the readability of the CD&A section and management incentives for obfuscation of compensation disclosures in 2007 and 2008. The authors find that CD&A sections of firms managed by overcompensated CEOs are more difficult to read. However, managers increase readability of their disclosure after receiving a comment letter from the SEC, underlining the improvement of executive compensation disclosure after regulatory scrutiny. Yang (2019) examines the impact of firm and management characteristics and the transparency of the CD&A section in the context of 2006 SEC regulation. The author finds that proprietary cost play a weaker role in determining compensation disclosure transparency in the post regulation years. Yang also shows that stronger external monitoring reduces the negative association between compensation disclosure transparency and managerial power and proprietary cost. Finally, the writer documents a negative relationship between excess CEO compensation and compensation disclosure transparency. Martin et al. (2021) explore the similarity of firm disclosures on the CD&A and find that a firm's future stock returns can be predicted by the changes from the previous year disclosures to the language and the construction of the CD&A.

The previous studies have not used textual analysis to examine the complete set of rules related to SEC regulations and accounting standards. However, textual analysis can be very useful in exploring content and retrieving missing information. Text analytics is subdivided into two main streams in the finance and accounting literature (Fisher et al. 2010). The first stream concerns manual and computational content analysis of accounting narratives, readability studies and related text-mining work. This part of the literature examines text elements in order to draw inferences and conclusions (e.g., regarding firm performance and stock prices). The second stream concerns retrieval of information, which consists of extracting

text elements and quantities imbedded in text from documents. Our study is more related to the second stream of the literature related to information extraction. Papers have contributed to this part of the literature by examining electronic financial reports from the EDGAR database. Since these reports are unstructured text documents, there are different file structures and terminologies. Extracting specific information from these documents represents a challenge for academic researchers and analysts who often include in their sample study a significant number of firms. Several papers have worked on creating intelligent software to handle these reports (Steier et al. 1997, Nelson et al. 2000). Bovee et al. (2005) developed on a prototype FRAANK<sup>37</sup> system, that extracts accounting numbers from financial statements by linking the line-item labels of financial statements to XBRL<sup>38</sup> synonyms. Grant and Conlon (2006) create a program that extracts from financial statement disclosures, information related to employee stock options. The EDGAR Extraction System is designed to recognize word phrases from Statement of Financial Accounting Standards (SFAS) No. 123. Ding and Chen (2006) build a text-mining system that automatically extracts data related to executive compensation from the SEC proxy filings. Cong et al. (2007) suggest a template-based approach which consists of retrieving from financial statements the structure and contents.

Regarding issue phrase classification, several papers have constructed various categories that include non-compensation related issue phrases. Cassel et al. (2013) examine the different factors affecting the probability of receiving a comment letter, the number of comments received and the cost of remediation. They find that in addition to factors related to Section 408 of the Sarbanes-Oxley Act, high complexity, engaging a small audit firm, low profitability and weak governance have a positive association with the receipt of a comment letter, the extent of comments and the cost of remediation. The authors carefully explore accounting issues and classify them into four different groups following Palmrose and Scholz (2004): core earnings (revenues and operating expenses), non-core earnings (impairments and restructurings), classification issues (balance sheet and cash flow) and fair value issues. The reason behind this classification is to determine whether relative remediation costs differ across comment topics. In a similar manner, Johnston and Petacchi (2015) investigate the content, resolution and informational consequences of SEC comment letters. The authors find that nearly half of the comments include accounting applications, financial reporting and disclosure issues. The study classifies issue phrases into four categories: accounting issues, accounting/financial

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<sup>37</sup> Financial Reporting and Auditing Agent with Net Knowledge.

<sup>38</sup> XBRL is a freely available framework of accounting standards for exchanging business information.

reporting/disclosure topics, business issues and tone and level of disclosure. This classification is done to explore the nature and frequency of comments in the letters.

In addition to the previous papers proposing different classifications of issue phrases, we examine several legal and accounting firms have also scrutinized SEC comment letters. Gibson, Dunn and Crutcher LLP carefully examine SEC's executive compensation disclosure rules in their executive compensation handbook (2020). The report detail the areas of interest of the SEC regarding executive compensation, such as the format and presentation of tables, the content of tables and the related narrative description. The law firm provides specific details concerning all the required tables in the disclosures. The other legal reports (Kirkland & Ellis LLP 2006; Morgan Lewis 2006; Willkie Farr & Gallagher LLP 2006; Latham & Watkins 2007) examining the new rules produce the same type of information. We also investigate accounting reports such as "SEC Comment Letter Considerations, Including Industry Insights" (Deloitte 2021) and "Highlights of trends in 2021 SEC comment letters" (Ernst Young 2021). These reports examine the trends, priorities and the different accounting and disclosure topics.

## **2.3 The creation of the dataset**

### *2.3.1 Initial AA extraction and analysis of compensation CL data quality*

We use the Audit Analytics (AA) database as our starting point to construct our sample of comment letters. The data has been downloaded from the Audit Analytics website in Excel Format and imported in Stata format<sup>39</sup>. Appendix A displays the definitions of the variables and terms used during this study.

The core of the original data consists of comment letters sent by the SEC to the firms (UPLOAD) regarding disclosures they have made. The data also contains companies' responses (CORRESP), but we choose to focus exclusively on UPLOADs for this project. The letters belong to "conversations" (CommentLetterConversationID) between the SEC and the firms. In total, our initial sample contains 1998 unique issue phrases classified in 34 issue types covering the period between 1996 and 2020. The leading issue type (18% of all the observations) is Accounting. However, the highest number of comment letters were sent between 2004 and 2020.

As a first step, we focus on letters sent from the SEC to the firms (UPLOADs). The data consists of 151 471 letters sent to firms corresponding to 976 484 issue phrases. We drop letters that are not attached to any Conversation ID (571) and letters for which the links do not work

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<sup>39</sup> We did not apply any filter while downloading the data.



(12). This selection process leads to 150 888 UPLOADS corresponding to 19 228 unique firms, 79 299 threads, 972 317 issue phrases and 1998 unique issue phrases (table 1/step 1).

The next step consists of constructing the initial compensation sample (table 1/step 2 and figure 1). That is, a sample composed exclusively of compensation-related issue phrases. In order to do that, we classify issue phrases into two categories: those referring to executive compensation in the first one and those referring to non-compensation issue phrases in the second one. We recognize a comment letter as a CCL if it contains at least one issue phrase related to executive compensation. The list of compensation issue phrases included in the initial compensation sample is detailed in Appendix C2.

[Insert table 1 about here]

The initial compensation sample contains 53 568 issue phrases and 72 unique compensation issue phrases with varying degrees of precision (table 1 and figure 2). In some cases, AA refers to a specific rule, paragraph, instruction (for example: Regulation S-K 402(s)). We refer to these issue phrases as “the precise issue phrases”. In the other cases, AA refers to a general topic (for example: Executive compensation plan disclosure issues). We refer to these as “the imprecise issue phrases”. In sum, the initial compensation sample is composed of 48 851 imprecise issue phrases (91%) and 4 717 precise issue phrases (9%). Moreover, we distinguish between issue phrases referring to an accounting issue (accounting standards), and those referring to an SEC regulation (SEC regulations). In total, the sample includes 48 unique issue phrases related to accounting standards (18 571 observations/ 35% of the observations of the initial compensation sample) and 24 issue phrases related to SEC regulations (34 997 observations- 65% of the total observations of the initial compensation sample). The initial compensation sample is composed of 53 568 issue phrases corresponding to 10 311 unique firms, 18 258 conversation ID threads and 23 963 letters. The statistics show that 54% of the firms included in AA have received at least one issue phrase related to executive compensation. The next step consists of reading several letters containing both types of issue phrases in order to properly understand the information provided by AA. After examining the letters related to executive compensation, we discovered that AA data has three main shortcomings. First, AA does not identify all the issue phrases contained inside the letters. In other words, the texts of some compensation comment letters contain sufficiently detailed references to regulations or norms, yet these are not systematically reported in the AA database. Second, some issue phrases identified by AA lack precision and accuracy. We are referring here to the imprecise issue phrases that constitute 91% of the initial compensation sample. Let us take a simple example. AA reports the issue phrase “Regulation S-K, Item 402 issues” which refers to the

general topic of executive compensation. However, this topic is composed of 21 paragraphs (going from 402(a) to 402(u)). These paragraphs are not always included in the AA database. Finally, in some letters, the SEC uses a narrative approach when commenting on firms' disclosures without referring to a specific rule.

Prior studies working on corporate disclosures have used a manual content analysis approach. Bryan (1997) manually examines the Management Discussion and Analysis (MD&A) section of annual reports in order to predict future performance. The main advantage of this method is that results can be more precise and detailed. However, a manual approach can be very costly. Papers following this concept have reduced samples which may limit the scope and the power of empirical results. In addition, follow-up studies can find a significant difficulty in replicating the results due to the subjectivity in the coding process. Another way of analyzing textual disclosures is to follow a computerized information retrieval approach. This approach consists of extracting specific information from a document. This methodology improves the power of the empirical results and allows follow-up studies to replicate the results.

We choose to adopt the latter approach and create a Python program (called Python I) that searches for the specific issue phrases that were overlooked by AA in some letters. In order to create an exhaustive list of specific issue phrases to search for, we begin by examining letters provided by AA. We randomly pick 1% of the sample letters (239) and search for every rule related to executive compensation. We then search online (Cornell Law School, FASB website) for all the issue phrases related to the general topics listed by AA<sup>40</sup>. Finally, we search for all the SEC press releases and reports from legal and accounting firms in order to complete our list of issue phrases. These steps allow us to create an exhaustive list of issue phrases to search for using the Python program.

### *2.3.2 Resolution of shortcoming 1: Python I*

Python I is a program created using Python, that searches for issue phrases that are included in letters yet are not always reported in the AA data.<sup>41</sup> We create an excel file with all the links to letters from the initial compensation sample (23 963 letters in total).

Audit Analytics reports a column named "COMMENTLETTERFTPFILENAMEKEY", which provides us with only part of the link related to the letter<sup>42</sup>. In order to have the complete link, we add "[www.sec.gov/Archives/](http://www.sec.gov/Archives/)" before every link, replace ".txt" by "filename1.pdf" and

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<sup>40</sup> For example: SFAS 123 issues, Regulation S-K 402 issues, Regulation S-K 403 issues, SAB Topic 14 issues, IFRS 2 issues, IAS 19 issues.

<sup>41</sup> Audit Analytics captures some of the precise issues yet overlooks a significant number of them. For instance, concerning Regulation S-K item 402, AA only lists 402(b) (without the specific paragraphs), 402(s) and 402(k). However, Regulation 402 contains 21 paragraphs in total.

<sup>42</sup> Example: [edgar/data/1750/0000000000-06-003570.txt](http://edgar/data/1750/0000000000-06-003570.txt)

remove the “-“. Note that letters are either in PDF format (links ending up with “filename1.pdf”) or txt format (link ending end up with “filename1.txt”). In a minority of cases, the links have other endings.<sup>43</sup>

The program runs as following. First, it converts all the pdf format letters to txt format and downloads them. Then, it searches for the defined specific issue phrases inside the downloaded letters. Third, it reports the results in an excel file. The excel file is composed of fifteen columns. The first nine columns are information related to the letters and already reported in AA.<sup>44</sup> The six remaining columns are built as following. The first five columns report the value of “1” if the program finds issue phrases related respectively to: SFAS 123, SFAS 123R, SAB Topic 14, other accounting issue phrases and finally regulatory issue phases. The last column named “Rules” displays the content of issue phrases found in letters. If the program does not find any of the defined issue phrases, it leaves a blank in the first five columns and “[ ]” in column six.

The results show that 8335 (35%) of the compensation letters contain at least one specific issue phrase (table 1/step 3). In the initial compensation sample, Audit Analytics had found 4 717 precise compensation issue phrases in 4 289 letters (18% of the total compensation letters). In total, Python I found 16 845 precise issue phrases. However, some issue phrases appear more than once inside the same letter<sup>45</sup>. After dropping the duplicated issue phrases, we end up with 14 326 issue phrases found by Python I in 8 335 letters, corresponding to 5 335 unique firms and 7 203 conversation ID threads. Among the 14 326 issue phrases found by Python I, 4 717 precise issue phrases were already identified by AA. Therefore, Python I found 9 609 additional issue phrases reflecting rules/regulations/norms which AA overlooked (figure 3).

We add the Python I rules to the initial Compensation Sample and create a new sample named “Compensation Sample 2”. The sample is composed of 63 177 observations: AA imprecise issues (48 851), the AA precise issues (4 717) as well as the precise issues found by Python I (9609) (figure 4).

Python I enable us to complete our initial compensation sample with missing precise rules. After resolving AA’s first shortcoming, we turn our attention to shortcomings number 2 and 3. Precisely, we think of a proper solution to accurately identify rules that the SEC does not refer to while commenting on disclosure irregularities in comment letters. After examining several

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<sup>43</sup>Example, <https://www.sec.gov/Archives/edgar/data/949721/000000000007010279/brooklyncheeseltr022707.pdf>.

<sup>44</sup> Essentially: Firm ID, Firm Name, File Date, Conversation ID, Link to the letter.

<sup>45</sup> Example: (<https://www.sec.gov/Archives/edgar/data/1006892/000000000009009720/filename1.pdf>) Regulation S-K Item 402(d) is repeated 5 times inside the same letter (CONVID 2 096; CIK: 1006892; Company Name: JDA SOFTWARE GROUP INC )

letters and conversations, we notice two important features. First, the SEC lists a complete set of requirements in the first letter without adding any additional request throughout the conversation with the firm. Subsequent letters from the SEC contain additional explanations and clarifications regarding initial requests. In other words, the SEC does not bring up new issues after the first letter sent to firms. We confirm this idea after analyzing 180 conversation ID threads (which constitute 1% of the total conversation threads in the sample). This suggests that we can analyze issue phrases on the conversation ID level rather than the letter level. Second, we compare information included in letters to the precise and imprecise issue phrases contained in our new database. The idea is to identify whether information conveyed by the precise issue phrases in our database is sufficient to explain the full content of the letter. In other words, we investigate whether imprecise issue phrases contain additional information not provided by the precise issue phrases. In order to have a clear answer, we explore three types of conversation threads (Table 2):

The identified threads are the ones that contain exclusively precise issue phrases. They account for 0,62% (114) of the total threads.

The non-identified threads are the ones that contain exclusively imprecise issue phrases. They account for 60,55% (11 055) of the total threads.

The hybrid threads are the ones that contain precise and imprecise issue phrases. They account for 38,83% (7 089) of the total threads.

[Insert table 2 about here]

After inspecting all the identified threads, we conclude that conversation threads composed of precise issue phrases exclusively transmit the full information contained in letters. Next, we scrutinize several conversation threads composed of imprecise issue phrases exclusively. We find that information contained in these letters come in the form of explanations and comments from the SEC without referring to a specific rule.

Finally, we examine the hybrid threads composed of precise and imprecise issue phrases from the same or different type (accounting standards and SEC regulations). Precisely, we check whether imprecise issue phrases add information to the threads containing precise issue phrases. We construct a table (Table 3), displaying the different possible combinations between precise and imprecise issue phrases of different types. For each combination of issue phrases, If the number of threads exceeds 1000, we select 50 random examples, extract the paragraph(s) related to compensation and check if the included precise issue phrases convey the full information contained in the thread. If the number of threads accounts for less than 1000, we take 10 random examples and follow the same approach. The results are presented in table 3.

We find that conversations including precise and imprecise issue phrases from the same type (both accounting standards or both SEC Regulations) contain the complete information. However, conversations including precise and imprecise issue phrases from different types (one accounting standard, the other SEC regulations), lack specific information and thus need to be further analyzed. We detail this result in Appendix B1 using several examples.

[Insert table 3 about here]

This finding allows us to split our current sample (Composed of the initial compensation sample and Python I issue phrases) into two subsamples (Table 4). First, the resolved sample that contains identified threads (threads containing exclusively precise issue phrases) and conversation ID threads including precise and imprecise issue phrases of the same type (5 715 Conv ID threads corresponding to 8 014 letters). Second, the testing sample that contains the non-identified threads (threads containing exclusively imprecise issue phrases) and conversation ID threads including precise and imprecise issue phrases of different types (12 543 Conv ID Threads corresponding to 15 949 letters).

Following the qualitative tests, we are able to identify threads containing full precise information (8 014 letters) and those lacking precise information (15 949 letters). The 15 949 remaining letters to analyze constitute 66% of the total letters from the initial sample. We randomly select 160 letters (1% of the remaining letters) and find that the SEC uses a narrative approach when commenting on firms' disclosures without referring to a specific rule. Thus, we think of a convenient solution to extract information from these letters.

[Insert table 4 about here]

### *2.3.3 Resolution of shortcomings 2 and 3: Python II*

In order to extract the remaining set of information from comment letters, we build another Python program named "Python II". The program searches for key words that can be associated to precise issue phrases. We create the program as following. First, in the resolved sample, we list the top 50 issue phrases in terms of frequencies in the sample. Then, for each issue phrase, we take 20 examples from letters and manually identify key words. Finally, we check the frequency of occurrence of these key words in the letters. If the chosen key words associated to a given precise issue phrase appear in 60% or more of the total letters containing the precise issue phrase, we consider that they are strongly related to the precise rule. Thus, the key words are included in Python II (table 5).

[Insert table 5 about here]

In sum, our qualitative results show that key words can be associated with 26 unique issue phrases. We then run the Python II program on the remaining letters (15 949 letters). The program finds 31 273 precise rules contained in 12 568 letters (79% of the remaining letters). However, 1851 of these rules were previously found by Python I. This implies that Python II contributes to the finding of 29 422 new/additional precise rules in 12 228 letters. We proceed our analysis by conducting robustness checks. In order to make sure that Python II does not detect “false key words”<sup>46</sup>, we randomly pick 1% of the found rules (294) and make sure that the found key words are related to the specified issue phrases.

The 15% remaining letters (3 721) did not include any identified key words or specific rule. Thus, they had to be manually classified. The results generate 3 823 additional precise rules. We will be referring to these as the manually treated issue phrases. Note that 157 letters (4% of the remaining letters) did not contain any rule related to executive compensation. These letters correspond to the issue phrase “Regulation S-K, Item 403 issues” that concerns executive compensation and other topics. We drop the ones that are not related to executive compensation. Appendix B provides the different topics included in Regulation S-K item 403. The final step consists of adding the additional issue phrases from Python II and the manually treated issue phrases to our compensation Sample 2. This leads to the creation of a more complete sample, composed of the AA issues (Precise and Imprecise), Python I precise rules, Python II precise rules and the manually treated precise rules (96 422 issues in total). This step is important as it allows us to verify that every conversation ID contains at least one precise issue phrase. After verification, we replace imprecise issue phrases with precise issue phrases, the imprecise issue phrases no longer being needed. The final precise compensation sample includes 47 571 observations (AA precise rules, Python I precise rules, Python II precise rules and the manually treated precise rules). We give concrete examples of issue phrases found in letters using AA, Python I and II and the manual treatment in table 6.

[Insert table 6 about here]

## **2.4 Final Sample Statistics**

Our final compensation sample is composed of 47 571 issue phrases corresponding to 10 268 unique firms, 18 134 conversation ID threads and 22 340 letters. Table 7 shows that firms working in the manufacturing industry (32%) are the most targeted ones by the SEC followed by Finance and insurance (15%) and information (10%) industries.

[Insert table 7 about here]

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<sup>46</sup> Key words that do not refer to the specified rules.

Table 8 displays the distribution of firm-year observations across the studied period (2004-2020). Consistent with the compensation literature, we find that executive compensation comment letters significantly increase as of 2006 and reaching a peak in 2010 (Ryans 2021).

[Insert table 8 about here]

Table 9, we provide details regarding the disposal of issue phrases in our final sample. The results show that accounting (SEC regulation) issue phrases account for about 30% (70%) of the total number of issue phrases in the sample. However, unique issue phrases related to accounting standards (SEC regulation) represent about 65% (35%) of the total number of unique issue phrases in the final sample.

[Insert table 9 about here]

Next, we list the top 10 issue phrases related to accounting standards and SEC regulations in table 10A. The first table indicates that “SFAS 123R, paragraph A240e” is the most represented accounting issue phrase. It is related to the description of the methodology and assumptions used for fair-value estimation. The rest of the accounting issue phrases refer to compensation cost for share-based payments, assumptions used in valuation methods, pension benefits and share-based payment arrangements. Regarding SEC regulations, the top 10 issue phrases (table 10B) concern general comments referring to executive compensation (402(a), 402(m)), but also the content of required tables by the SEC (402(c), 402(n), 402(g), 402(d)). Moreover, we also find issue phrases related to the justification of compensation policies and practices (402(b)(2)(vi), 402(b)(2)(xiv), 402(b)(2)(v), 402(b)(2)(xv) and 402(b), instruction 4) and issue phrases associated to the narrative description of requested tables by the SEC (402(e), 402(o)).

[Insert tables 10A and 10B about here]

## **2.5 Issue phrases classification**

After completing our compensation comment letter sample, we turn our attention to the classification of issue phrases. Categorization of compensation issue phrases can give us a clearer and better understanding of what triggers the SEC in firm disclosure reports.

We first prospect the compensation comment letter literature. Murphy (2013) discusses the evolution of executive compensation throughout time and documents its trends in both U.S and international firms. The author shows that government intervention has been largely ignored by researchers despite being both a response and a driver of time trends in CEO pay. The study also investigates the level and structure of CEO pay packages (Section 2 of the paper). While comparing Grant-date Pay and Realized Pay, Murphy distinguishes between five different components of executive compensation: base salary and discretionary bonus, non-equity

incentives, stock options, stock awards and finally other compensation including perquisites, signing bonuses, termination payments, deferred compensation and pension benefits. Edmans et al. (2017) examine the theoretical and empirical literature on executive compensation. The authors present the evolution of executive pay throughout time and across firms in U.S. and non-U.S. firms. Importantly, the study analyzes the main components of executive pay and the evolution of their importance in compensation packages throughout history. Six important components of executive compensation packages are examined: salaries and current bonuses, payouts from long-term incentive plans (including restricted stocks), Option grants, perks, pensions and severance pay. The authors discuss the standing of each component in the total compensation package and find that the use of options (restricted stocks) have highly declined (increased) between 2000 and 2014. Regarding pensions, they document that the mean overall pension value over the period 2006-2012 represents 23% of the CEO's total wealth held in the firm. This result suggests the importance of taking into consideration pension benefits. Another important documented component is severance pay that comes in the form of golden parachutes (awarded to CEOs who lose their jobs because of their firm got acquired) or golden handshakes (attributed to retired or fired CEOs).

Robinson et al (2011) and Wang et al. (2022) examine the association between excess CEO compensation and the number of issue phrases related to SEC regulations. The authors classify compensation issue phrases related to SEC regulations in three categories. First, pay-related compensation issue phrases relevant to the content of compensation contracts. Second, governance-related issue phrases linked to related-party transactions disclosures, management's role in the determination of executive pay and directors' independence and pay. Third, readability-related issue phrases associated to the narrative description of tables, the complexity of the used language and the specified disclosure formats required by the SEC.

Other non-compensation related papers in the literature suggest other classifications of issue phrases. Cassel et al (2013) examine the different determinants of receiving a comment letter, the number of comments received and the cost of remediation. The authors focus on accounting issue phrases and classify them into four different groups following Palmrose and Scholz (2004): core earnings (revenues and operating expenses), non-core earnings (impairments and restructurings), classification issues (balance sheet and cash flow) and fair value issues. This classification is also adopted by Heese et al. (2017) who investigate the relationship between firm political connections and comment letter reviews. Moreover, Johnston and Petacchi (2015) examine the content, resolution and informational consequences of SEC comment letters. The authors classify issue phrases into four categories: accounting issues,



accounting/financial reporting/disclosure topics, business issues and tone and level of disclosure.

We also take into account the SEC press releases as of 2005 that contain detailed information regarding the new rules requiring executive compensation disclosure. The SEC's main objective is to "...improve the quality and usefulness of the information that investors receive about executive compensation" (John White, director of the SEC's division of corporation finance, 2006). In order to do that, firms are required to provide specific information related to each name executive officer in formatted tables that will be followed by narrative descriptions and explanations made in plain English principles. The narrative disclosures concern the objectives of the company's compensation programs, the justification of the choice of each element of compensation and the formula and methodology adopted in this regard. Moreover, firms must justify their compensation policies regarding the allocation between long-term and currently paid compensation on one hand, and between cash and non-cash compensation on the other hand among different forms of non-cash compensation. Regarding equity-based compensation, companies are expected to justify how the determination is made and when the award is granted. Another important demand concerns the description of the structure and role of each element of compensation in companies' performances and executives' individual performance. Companies must also list the factors taken into account in decisions to increase or decrease executive compensation. The SEC also instruct corporations to provide explanations regarding the impact of prior compensation on the setting of current elements of compensation. Furthermore, enterprises are also requested to describe the effect of accounting and tax treatments of a particular form of compensation. Firms must also provide justifications for their equity and other security ownership requirements or guidelines, and any other policy concerning hedging the economic risk of such ownership. Importantly, corporations are required to disclose if they engaged in any benchmarking in setting executive compensation, and if so, identify the benchmark, its components and the role of executive officers in the whole compensation process.

Finally, in order to have the complete picture, we search for legal and accounting reports from international firms regarding firms' executive compensation disclosures. Precisely, we examine "The executive compensation handbook (2020)" by Gibson, Dunn and Crutcher LLP. The report provides the different areas of concern to the SEC such as the format and presentation of tables, the content of tables and the related narrative description. We also find other legal reports (Kirkland & Ellis LLP 2006; Morgan Lewis 2006; Willkie Farr & Gallagher LLP 2006; Latham & Watkins 2007) who confirm the information we previously found. We

also examine reports from international accounting firms. Deloitte (2021) and Ernst Young (2021) examine the trends, priorities and different accounting and disclosure topics. In addition to information related to SEC regulations, these accounting reports investigate financial statement accounting and disclosure topics such as share-based payment awards and the different valuation methodologies employed by firms.

The compensation comment letter literature, SEC press releases and legal and accounting reports enable us to classify issue phrases into three different categories. The first one is related to the different compensation components of executives: The whole compensation package, stock awards and stock options, pension benefits, termination benefits, deferred compensation and tax. In the second category, we classify issue phrases according to their informational functions: content, format and standardization, justification of compensation policies and practices and methodology adopted. Finally, we construct categories related to the different tables required by firms from the SEC: summary compensation tables, stock options, share-based payments, option exercises and stock-vested table, grants of plan-based awards, outstanding equity awards and golden parachute.

Table 11 shows the distribution of issue phrases in the categories related to compensation components and tables required by the SEC. Our sample shows that about 48% of the total issue phrases are linked to the whole compensation package. The rest of the issue phrases are divided between Stock awards and Stock options (43%), Pension benefits (25%) and terminations benefits, tax and deferred compensation (14%). Regarding the two main compensation components, we find that 99% of the issue phrases associated to the whole compensation package are related to SEC regulations, whereas 62% (38%) of the issue phrases linked to stock awards and stock options are related to accounting standards (SEC regulations). We show that about 14% of the issue phrases related to the whole compensation package are associated to the summary compensation table. Furthermore, we find that 69% of the issue phrases related to Stock awards and Stock options are related to share-based payments. The rest is divided between Option exercises (11%), Grants of plan-based awards (9%), stock options (7%) and outstanding equity awards (4%). Concerning unique issue phrases, we find that 65% of unique issue phrases are related to Stock awards and stock options. The rest of the unique issue phrases are divided between the whole compensation package (23%), Pension benefits (6%) and terminations benefits, tax and deferred compensation (6%).

[Insert table 11 about here]

We display statistics related to all the categories created in table 12. Regarding informational functions, note that every issue phrase can be included in one or more informational function.

Let us take the example of “Regulation S-K, item 402(e and o) which is related to the narrative description of summary compensation table and grants of plan-based awards. This issue phrase is associated to two informational functions: the justification of compensation policies and practices; and the methodology and assumptions adopted by the firm. This implies that for each compensation component, the sum of the observations in informational functions is not equal to the total observations included in that component. Table 12 indicates that three informational functions include issue phrases that are mostly related to SEC regulations (Format/standardization 90%, Content 72% and Justification 89%), whereas methodology includes issue phrases mostly related to accounting standards (77%). Moreover, 67% (33%) of the issue phrases related to the whole compensation package concern the justification of compensation policies and practices (Format/standardization). Note that only 3% of the issue phrases associated to the whole compensation package are linked to the methodology and assumptions employed by the firm. This result is logical as the whole compensation package is composed of issue phrases related to SEC regulations in 99% of the cases. Regarding the stock awards/stock options component, results are more dispersed as 60% of the issue phrases are related to the methodology and assumptions adopted by the firm. We also find that 42% (29%) of the issue phrases are related to the content (format/standardization) of the required tables. The last informational function related to justification of compensation policies and practices includes 25% of the total issue phrases linked to stock awards and stock options.

[Insert table 12 about here]

## **2.6 Conclusions and suggestions for future research:**

SEC compensation comment letters addressed to firms can reveal valuable information regarding firms’ compensation policies and practices. The retrieval of complete information included in these letters is important in order to have a clearer and better understanding of what is happening in firms in terms of management and what is triggering the SEC. Importantly, compensation comment letters can provide us with critical information regarding managerial incentives and motives in firms.

Despite the few studies examining CCL (Robinson et al. 2011, Laksmana et al. 2012, Yang 2019 and Wang et al. 2022), no paper has examined the complete set of compensation rules used by the SEC in comment letters. In this paper, we build a new dataset containing all compensation issue phrases related to SEC regulations and accounting standards. We use the audit analytics database as a starting point to download all the letters related to executive compensation. We then design a textual analysis program that extract rules that were

overlooked by audit analytics. We also complete our information by extracting key words that are associated to specific rules using a complementary textual analysis program. Our programs enable us to identify 85% of the overlooked content in compensation comment letters. The 15% remaining which do not include specific rules or “key words” referring to rules are resolved using manual content analysis. Our final dataset includes 47 571 issue phrases of which 33 289 (70%) are related to SEC regulations and 14 282 (30%) are related to accounting standards. We also classify issue phrases in different categories in order to have a clearer picture of the SEC’s main interests. Our categorization of issue phrases is related to compensation components, informational functions and tables required by the SEC in firms’ disclosures. We find that issue phrases in our sample are related to the whole compensation package in 48% of the cases, whereas they are linked only to stock awards and stock options in 43% of the cases. However, we find that unique issue phrases related to stock awards and stock options (the whole compensation package) in our sample account for 65% (23%) of the total cases. Moreover, we find that three out of four informational functions (format/standardization, content and justification) are mostly related to SEC regulations, while methodology is mostly related to accounting standards.

Our study makes important contributions. First, this is the first paper that identifies the full information overlooked by the AA database and suggests a solution to extract more complete information. Using our dataset, future studies will be able to examine the complete set of compensation-related information contained in comment letters. To our knowledge, no paper has examined issue phrases related to both SEC regulations and accounting standards. Also, this paper extends the literature by suggesting new specific classifications of issue phrases that can be useful for future papers related to CCLs.

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Table 1: Sample construction																
Steps	SEC letters (UPLOAD)		Unique Firms		Conversation ID Threads		Total Issue Phrases		Unique Issue Phrases		Issue phrases					
	Number	%	Number	%	Number	%	Number	%	Number	%	Imprecise	Precise AA	Python I Only	Python II Only	Manual Treatment	Total Precise
<b>1) Audit Analytics extraction:</b> all comment letters sent by the SEC with identifiers	150 888	100	19 228	100	79 299	100	972 317	100	1 998	100						
<b>2) Selection of the initial compensation sample:</b> executive compensation comment letters sent by the SEC with identifiers	23 963	15,88%	10 311	53,62%	18 258	23,02%	53 568	5,5%	72	3,60%	48 851	<b>4 717</b>				<b>4 717</b>
<b>3) Resolution of shortcomings 1 and 2:</b> Identification of precise issue phrases using a Python program to search inside comment letters for named rules and standards. (Python I)							<b>14 326</b>		145			4 717	<b>9 609</b>			<b>9 609</b>
<b>4) Resolution of shortcoming 3:</b> Identification of precise issue phrases using a Python program to search comment letters for keywords defining rules and standards. (Python II)							<b>29 422</b>		26					<b>29 422</b>		<b>29 422</b>
<b>5) Manual Identification</b> of precise issue phrases by reading CLs and pinpointing references to rules and standards							<b>3 823</b>		18						<b>3 823</b>	<b>3 823</b>
<b>CCL final sample</b>	<b>23 963</b>	<b>15,88%</b>	<b>10 311</b>	<b>53,62%</b>	<b>18 258</b>	<b>23,02%</b>	<b>47 571</b>	/	<b>145</b>	/		<b>4 717</b>	<b>9 609</b>	<b>29 422</b>	<b>3 823</b>	<b>47 571</b>

**Table 2: Conversation ID Threads composition**

This table shows the three types of conversation threads after completing the initial compensation sample with the Python I precise issue phrases:  
 Identified threads are the ones containing exclusively precise issue phrases  
 Non identified threads are the ones containing exclusively imprecise issue phrases  
 Hybrid threads are the ones containing precise and imprecise issue phrases

	<b>Number of letters</b>		<b>Conversation ID Threads</b>		<b>Issue Phrases</b>	
<b>Identified (Only precise IP)</b>	120	0,50%	114	0,62%	120	0,19%
<b>Not identified (Only imprecise IP)</b>	13 137	54,82%	11 055	60,55%	19 189	30,37%
<b>Hybrid (Precise IP + Imprecise IP)</b>	10 706	44,68%	7 089	38,83%	43 868	69,44%
<b>Total Letters</b>	<b>23 963</b>	<b>100,00%</b>	<b>18 258</b>	<b>100,00%</b>	<b>63 177</b>	<b>100,00%</b>



**Table 3: Results of the qualitative tests**

This table displays the results of the different combinations of IP by Conv thread. Columns (2) and (3) show the various cases. Columns (4) and (5) disclose the number of letters and conversation threads concerned. Column (6) illustrates the percentage of cases where the complete information is contained. Column (7) indicates whether the qualitative test is conclusive or not.

(1) Alphabet Case	(2) Regulatory IP	(3) Accounting IP	(4) Number of Letters	(5) Number of Conv ID Threads	(6) % of complete information	(7) Conclusive test: Ok Not conclusive test: X
A	/	Precise + Imprecise	1 741	1 341	94	Ok
B	Imprecise	Precise	9	6	40	X
C	Imprecise	Precise + Imprecise	605	332	10	X
D	Precise	Imprecise	15	10	0	X
E	Precise + Imprecise	/	5 582	4 005	82	Ok
F	Precise + Imprecise	Imprecise	2 182	1 139	36	X
G	Precise	Imprecise + Precise	8	5	90	Ok
H	Precise + Imprecise	Precise	1	1	100	Ok
I	Precise + Imprecise	Precise+ Imprecise	563	250	100	Ok
J	Precise	Precise	120	114	-	Ok
K	Imprecise	Imprecise	13 137	11 055	-	X
<b>Total</b>			<b>23 963</b>	<b>18 258</b>		

**Table 4: Resolved vs Testing Sample**

This table shows the resolved and the testing samples.

**The resolved sample** includes the conversations composed of precise issue phrases exclusively OR both precise and imprecise issue phrases from the same type (Accounting Standards or SEC Regulations).

**The Testing sample** includes the rest of the conversations that must be resolved.

Restriction	Letters	Unique CL Threads	Unique Firms	Precise issues (AA)	Precise issues (Python I)	Imprecise issues	Total Issues
<b>Initial Compensation sample + Python I</b>	23 963	18 258	10 311	4 717	9 609	48 851	<b>63 177</b>
Resolved Sample	8 014	5 715	4 485	3 778	7 028	20 691	31 497
Testing Sample	15 949	12 543	8 179	939	2 581	28 160	31 680

**Table 5: Key words linked to the specific SEC rules (SEC Regulations or accounting standards)**

Rules	Key words Linked to the rule
Regulation S-K, Item 402(d) issues	incentive awards, incentive plan award, option grants, restricted share awards, option awards, Grants, Incentive Awards, grants, Option Awards, Grant of, compensation awards Grants of Plan-Based Awards Grant of Plan-Based Awards Grants of Plan Based Awards Grants of Plan Based Awards grant of plan-based awards Equity-Based Awards restricted stock grant
Regulation S-K, Item 402(f) issues	outstanding options, Outstanding Options, Outstanding equity awards, outstanding equity awards, Outstanding Equity Awards
SFAS 132 issues	benefit plans, benefit plan, retirement benefits, pension plan, employee benefit plans, pension expense, pension costs, Employee Benefit Plans, Retirement Benefits, Benefit Plans, Pension Plan, Pension Costs, Pension plan, retirement Benefits, Benefit Plan, Pension Expense, Retirement benefits

<p>Regulation S-K, Item 402(b)(2)(vi) issues</p>	<p>incentive plan, Incentive Plan, equity-based incentive programs, Compensation Program, Incentive plan, base salary, Base Salary, base salaries, Base Salaries  Incentive Award, performance-based financial objectives, performance-based financial objectives, Incentive Compensation, incentive compensation</p>
<p>Regulation S-K, Item 402(a) issues</p>	<p>Compensation disclosure, compensation disclosure, compensation information, Compensation Disclosure, other annual compensation, other compensation, Other Compensation, Other Annual Compensation, Other compensation, disclosure requirements regarding compensation, Compensation Information, Compensation information, Compensation and Related Person Disclosure, compensation and related person disclosure, Executive Officer and Director Compensation, Officer Compensation, Executive and Director Compensation, Compensation of Directors and Executive Officers, Unearned Compensation, Officer Compensation, Compensation and Related Person disclosure, Compensation of directors and executive officers, executive and director compensation, Compensation of Directors and Officers, disclosure about, compensation of directors and officers</p>

Regulation S-K, Item 402(b)(2)(xv) issues	Compensation Committee, compensation committee, Compensation committee, COMPENSATION COMMITTEE
Regulation S-K, Item 402(b)(1)(iii) issues	element of compensation, elements of compensation, compensation elements, Elements of Compensation, Compensation Elements, Element of Compensation, bonus, Bonus, Compensation Element
Regulation S-K, Item 402(b), Instruction 4 issues	competitive harm, Competitive harm
Regulation S-K, Item 402(s) issues	disclosure is not necessary, disclosure is unnecessary, compensation policies, Compensation policies
SAB Topic 14:D issues	Black-Scholes, volatility assumption, simplified method, fair value of options, valuation model, implied volatility, historical volatility, expected volatility Valuation assumptions, Volatility
Regulation S-K, Item 402(g) issues	weighted-average exercise price of options, exercise of options, Exercise of Options, stock options, exercise of Options, Option Exercises and Stock Vested, Tax benefit, common stock that relate to compensation, Stock Options, option exercises and stock vested
Regulation S-K, Item 402(b)(2)(xiv) issues	benchmark, peer group, peer companies, survey data, Benchmark, compensation surveys, Peer Group, Survey Data

Regulation S-K, Item 402(c) issues	compensation table, Summary compensation table, Compensation Table, Summary Compensation table, compensation table, Compensation table
Regulation S-K, Item 402(b)(2)(v) issues	performance goal, performance goals, performance targets, performance target, qualitative goals, qualitative goal, performance objectives, performance objective, compensation objectives, Performance Targets, Performance Goal
Regulation S-K, Item 402(b)(2)(vii) issues	individual performance, individual performances, individual officer's performance, individual factors, individual compensation amounts, individual objectives, individual Performance, Individual Performance
Regulation S-K, Item 402(e) issues	narrative disclosure, narrative description, Narrative Description, Narrative description, Narrative disclosure, Narrative Disclosure, employment agreements, Employment Agreements, Employment agreements
Regulation S-K, Item 402(j) issues	termination or change, termination payments, termination employment, potential payments and benefits, provision of benefits, change in control benefits, benefits under the change in control, change of control, Change of Control, compensation arrangements, compensation arrangement, Termination or Change, Termination Payments, compensation agreement, Compensation Agreement

SFAS 87 issues	retirement benefits, benefit plans, benefit plan, pension plan, employee benefit plans, pension expense
Regulation S-K, Item 402(i) issues	deferred compensation table, deferred compensation, deferred stock compensation, unearned compensation, Deferred Compensation
SFAS 123R, paragraph A240e	fair value, fair market value, Fair Value, fair value of stock options and warrants, fair value of your share-based compensation awards, fair value of stock options, description of expected term and volatility assumptions, Fair market value, Fair Market Value
SFAS 123R, paragraph A240c	weighted-average grant date fair value of options, intrinsic value, total fair value of shares vested, intrinsic value, Intrinsic Value
SFAS 123R, paragraph A240g	tax benefit, compensation cost, Compensation expense, compensation expense, Compensation Expense
Regulation S-K, Item 702 issues	Indemnification of Directors and Officers, Indemnification Of Directors And Officers indemnification of directors and officers
Exchange Act Rule 14a-21 issues	Advisory Vote on Executive Compensation, advisory vote to approve the compensation
Regulation S-K, Item 402(h) issues	retirement plan, Retirement Plan, Pension Benefits, Pension Plan, pension benefit, Pension Benefit
Regulation S-K, Item 402(t) issues	Golden parachute, golden parachute, Golden Parachute

**Table 6: Examples of rules inside letters**

Source	Rule	Letter Link	Paragraph
Audit Analytics	Regulation S-K, Item 402(b), Instruction 4 issues	<a href="https://www.sec.gov/Archives/edgar/data/1750/000000010012687/filename1.pdf">https://www.sec.gov/Archives/edgar/data/1750/000000010012687/filename1.pdf</a>	Executive Compensation, page 20 2. We note on page 25 that the performance goals for Messrs. Clark and Stinson’s annual cash incentive opportunities were based on the “financial measures for their respective business groups.” It appears that you have not disclosed the target pre-tax income, return on invested capital, and cash flow for Aviation Supply Chain for Mr. Clark and Structures and Systems for Mr. Stinson. Please confirm that in future filings you will disclose the specific performance targets used to determine cash bonuses. Alternatively, provide a supplemental analysis as to why it is appropriate to omit these targets. To the extent that it is appropriate to omit specific targets, <b>please provide the disclosure pursuant to Instruction 4 to Item 402(b)</b> . General statements regarding the level of difficulty, or ease, associated with achieving performance goals are not sufficient. In discussing how likely it will be for the company to achieve the target levels or other factors, provide as much detail as necessary without providing information that poses a reasonable risk of competitive harm.
Python I	Regulation S-K, Item 402(e) and 402(o)	<a href="https://www.sec.gov/Archives/edgar/data/2034/000000009010540/filename1.pdf">https://www.sec.gov/Archives/edgar/data/2034/000000009010540/filename1.pdf</a>	2008 Grants of Plan-Based Awards, page 19 10. Please describe in further detail the performance-based conditions, and any other material conditions, that are applicable to the awards shown in your Grants of Plan-Based Awards table. See Item <b>402(e)(1)(iii)</b> of Regulation S-K.
Python II	1) Regulation S-K, Item 402(b)(2)(vii) issues 2) Regulation S-K, Item 402(c) and 402(n)	<a href="https://www.sec.gov/Archives/edgar/data/4187/000000011037840/filename1.pdf">https://www.sec.gov/Archives/edgar/data/4187/000000011037840/filename1.pdf</a>	On page 12, we note your statement that you issued 60,500 shares of common stock as <b>performance-based awards</b> in 2010. We further note on page 15 that you issued 60,000 shares of common stock to management relating to the year ended December 31, 2010. Please tell us whether any of these shares were issued to your named executive officers based on corporate or <b>individual performance</b> and if so, where these shares are reflected in the <b>Summary Compensation Table</b> .
Manual treatment	Regulation S-K, Item 402(a) and 402(m)	<a href="https://www.sec.gov/Archives/edgar/data/4969/000000010008355/filename1.pdf">https://www.sec.gov/Archives/edgar/data/4969/000000010008355/filename1.pdf</a>	11. Please provide to us and undertake to include in your future filings, discussion of how you were otherwise affected by these errors including but not limited to, your tax payments and your <b>compensation to executive officer and directors</b> . In this regard, advise us if the <b>compensation of the named executives and directors has been or will be affected by the restatements for 2007, 2008, and/or 2009</b>



**Table 7: Firms receiving Compensation-related comment letters by industry**

<b>Description</b>	<b>NAICS Code</b>	<b>Number in CL Compensation Sample</b>	<b>% in CL Compensation Sample</b>
Agriculture, Forestry, Fishing and Hunting	11	64	0,62%
Mining	21	753	7,28%
Utilities	22	323	3,14%
Construction	23	134	1,31%
<b>Manufacturing</b>	<b>31-33</b>	<b>3 313</b>	<b>32,20%</b>
Wholesale Trade	42	355	3,45%
Retail Trade	44-45	417	4,05%
Transportation and Warehousing	48-49	208	2,03%
<b>Information</b>	<b>51</b>	<b>1 071</b>	<b>10,34%</b>
<b>Finance and Insurance</b>	<b>52</b>	<b>1 613</b>	<b>15,63%</b>
Real Estate Rental and Leasing	53	169	1,64%
Professional, Scientific, and Technical Services	54	758	7,35%
Management of Companies and Enterprises	55	83	0,81%
Administrative and Support and Waste Management and Remediation Services	56	213	2,05%
Educational Services	61	49	0,47%
Health Care and Social Assistance	62	148	1,44%
Arts, Entertainment, and Recreation	71	91	0,89%
Accommodation and Food Services	72	190	1,85%
Other Services (except Public Administration)	81	53	0,51%
Public Administration	92	10	0,10%
Nonclassifiable Establishments	99	296	2,86%
<b>Total</b>		<b>10 311</b>	<b>100,00%</b>

<b>Table 8: Firm-Years observations</b>		
<b>Year</b>	<b>Firm-Years Observations</b>	
	<b>Number</b>	<b>%</b>
2004	131	0,80%
2005	1092	6,65%
2006	1474	8,98%
2007	1695	10,33%
2008	1731	10,55%
2009	2083	12,69%
2010	2171	13,23%
2011	1412	8,60%
2012	951	5,79%
2013	961	5,86%
2014	828	5,04%
2015	622	3,79%
2016	536	3,27%
2017	395	2,41%
2018	267	1,63%
2019	53	0,32%
2020	11	0,07%
<b>Total</b>	<b>16 413</b>	<b>100,00%</b>

<b>Table 9: Issue Phrases-Accounting standards vs SEC Regulations</b>					
	<b>Accounting standards</b>	<b>%</b>	<b>SEC Regulations</b>	<b>%</b>	<b>Total</b>
<b>Issue Phrases</b>	14 282	30,02%	33 289	69,98%	47 571
<b>Unique issue phrases</b>	94	64,83%	51	35,17%	145

<b>Table 10A: Top 10 Accounting standards Issue phrases</b>								
<b>Number</b>	<b>Issue Phrase</b>	<b>Subject</b>	<b>Frequency</b>	<b>Audit Analytics</b>	<b>Python I</b>	<b>Python II</b>	<b>Manual treatment</b>	<b>% of Total Accounting</b>
1	SFAS 123R, paragraph A240e	For each year for which an income statement is presented: (1) A description of the method used during the year to estimate the fair value (or calculated value) of awards under share-based payment arrangements. (2) A description of the significant assumptions used during the year to estimate the fair value (or calculated value) of share-based compensation awards	5953	0	91	5862	0	41,68%
2	SFAS 123R, paragraph A240g	For each year for which an income statement is presented: (1) Total compensation cost for share-based payment arrangements (a) recognized in income as well as the total recognized tax benefit related thereto and (b) the total compensation cost capitalized as part of the cost of an asset. (2) A description of significant modifications, including the terms of the modifications, the number of employees affected, and the total incremental compensation cost resulting from the modifications.	1804	0	38	1766	0	12,63%
3	SAB Topic 14:D	Certain Assumptions Used in Valuation Methods	1262	180	0	1082	0	8,84%
4	SFAS 87	Employers' Accounting for Pensions	868	126	0	742	0	6,08%
5	SFAS 132	Employers' Disclosures about Pensions and Other Postretirement Benefits—an amendment of FASB Statements No. 87, 88, and 106	699	19	96	584	0	4,89%
6	SFAS 123R, paragraph A240a	A description of the share-based payment arrangement(s), including the general terms of awards under the arrangement(s), such as the requisite service period(s) and any other substantive conditions (including those related to vesting), the maximum contractual term of equity (or liability) share options or similar instruments, and the number of shares authorized for awards of equity share options or other equity instruments. An entity shall disclose the method it uses for measuring compensation cost from share-based payment arrangements with employees.	605	0	22	0	583	4,24%

7	SFAS 123R, paragraph A240c	For each year for which an income statement is provided: (1) The weighted-average grant-date fair value (or calculated value for a nonpublic entity that uses that method or intrinsic value for awards measured at that value pursuant to paragraphs 24 and 25 of this Statement) of equity options or other equity instruments granted during the year. (2) The total intrinsic value of options exercised (or share units converted), share-based liabilities paid, and the total fair value of shares vested during the year.	571	0	69	502	0	4,00%
8	SFAS 123, paragraph(s) 45-48	Disclosures	285	257	28	0	0	2,00%
9	APB Opinion No. 25 issues	Accounting for stock issued to employees	261	260	1	0	0	1,83%
10	SAB Topic 14:F	Classification of Compensation Expense Associated with Share-Based Payment Arrangements	235	233	2	0	0	1,65%

**Table 10B: Top 10 SEC Regulations Issue phrases**

Number	Issue Phrase	Subject	Frequency	Audit Analytics	Python I	Python II	Manual treatment	% of Total Regulatory
1	Regulation S-K, Item 402(a) and 402(m)	General	4242	0	668	1404	2170	12,74%
2	Regulation S-K, Item 402(c) and 402(n)	Summary compensation table	3309	0	1442	1867	0	9,94%
3	Regulation S-K, Item 402(b)(2)(vi)	How specific forms of compensation are structured and implemented to reflect these items of the registrant's performance, including whether discretion can be or has been exercised (either to award compensation absent attainment of the relevant performance goal(s) or to reduce or increase the size of any award or payout), identifying any particular exercise of discretion, and stating whether it applied to one or more specified named executive officers or to all compensation subject to the relevant performance goal(s)	2765	0	234	2530	1	8,31%
4	Regulation S-K, Item 402(o) and 402(e)	Narrative disclosure to summary compensation table	2504	0	556	1842	106	7,52%
5	Regulation S-K, Item 402(g)	Option exercises and stock vested table	2180	0	75	2105	0	6,55%

6	Regulation S-K, Item 402(b)(2)(xiv)	Whether the registrant engaged in any benchmarking of total compensation, or any material element of compensation, identifying the benchmark and, if applicable, its components (including component companies)	2075	0	1030	1045	0	6,23%
7	Regulation S-K, Item 402(b), Instruction 4	Registrants are not required to disclose target levels with respect to specific quantitative or qualitative performance-related factors considered by the compensation committee or the board of directors, or any other factors or criteria involving confidential trade secrets or confidential commercial or financial information, the disclosure of which would result in competitive harm for the registrant	2059	1875	11	173	0	6,19%
8	Regulation S-K, Item 402(d)	Grants of plan-based awards table	1817	0	393	1338	86	5,46%
9	Regulation S-K, Item 402(b)(2)(v)	What specific items of corporate performance are taken into account in setting compensation policies and making compensation decisions	1741	0	703	1038	0	5,23%
10	Regulation S-K, Item 402(b)(2)(xv)	The role of executive officers in determining executive compensation	1584	0	87	1497	0	4,76%

**Table 11: Issue phrases related to compensation components and tables required by the SEC**

Number	Level	Topic	Frequencies	%	Unique issue phrases	%
<b>1</b>	1	<b>Compensation Package</b>	<b>23 022</b>	<b>48,4%</b>	<b>33</b>	<b>22,8%</b>
1.1	2	<i>Summary Compensation Table</i>	3 309	14,4%	1	3,0%
<b>2</b>	1	<b>Stock awards and Stock Options</b>	<b>20 307</b>	<b>42,7%</b>	<b>94</b>	<b>64,8%</b>
2.1	2	Stock Options	1 428	7,0%	16	17,0%
2.2	3	<i>Share-based payments</i>	13 987	68,9%	71	75,5%
2.3	3	<i>Option exercises and stock vested table</i>	2 180	10,7%	1	1,1%
2.4	3	<i>Grants of plan-Based Awards</i>	1 879	9,3%	5	5,3%
2.5	3	<i>Outstanding equity awards at fiscal year-end table</i>	833	4,1%	1	1,1%
<b>3</b>	1	<b>Deferred Compensation</b>	<b>435</b>	<b>0,9%</b>	<b>1</b>	<b>0,7%</b>
<b>4</b>	1	<b>Tax</b>	<b>13</b>	<b>0,0%</b>	<b>3</b>	<b>2,1%</b>
<b>5</b>	1	<b>Pension Benefits</b>	<b>2 353</b>	<b>4,9%</b>	<b>9</b>	<b>6,2%</b>
<b>6</b>	1	<b>Termination</b>	<b>1 441</b>	<b>3,0%</b>	<b>5</b>	<b>3,4%</b>
6.1	2	<i>Golden parachute</i>	88	0,2%	1	0,7%
<b>Total</b>			<b>47 571</b>	<b>100,0%</b>	<b>145</b>	<b>100,0%</b>

**Table 12: Issue Phrases-Compensation components vs Informational functions**

Informational Functions Compensation components		Frequencies (in Sample)		Unique Issue Phrases		Format / standardization		Content		Justification		Methodology		
<b>1</b>	<b>Whole compensation Package</b>	SEC Reg.	23 008	99,9%	32	97,0%	7 616	33%	4 352	19%	15 405	67%	667	3%
		Accounting	14	0,1%	1	3,0%	0	0%	14	100%	0	0%	0	0%
<b>Total</b>			<b>23 022</b>	<b>48,4%</b>	<b>33</b>	<b>22,8%</b>	<b>7 616</b>	<b>33%</b>	<b>4 366</b>	<b>19%</b>	<b>15 405</b>	<b>67%</b>	<b>667</b>	<b>3%</b>
<b>2</b>	<b>Stock Awards and Stock Options</b>	SEC Reg	7 769	38,3%	12	12,8%	5 204	67%	5 210	67%	2 558	33%	2 505	32%
		Accounting	12 538	61,7%	82	87,2%	741	6%	3 308	26%	2 425	19%	9 677	77%
<b>Total</b>			<b>20 307</b>	<b>42,7%</b>	<b>94</b>	<b>64,8%</b>	<b>5 945</b>	<b>29%</b>	<b>8 518</b>	<b>42%</b>	<b>4 983</b>	<b>25%</b>	<b>12 182</b>	<b>60%</b>
<b>3</b>	<b>Deferred compensation</b>	SEC Reg	435	100,0%	1	100,0%	0	0%	435	100%	0	0%	0	0%
		Accounting	0	0,0%	0	0,0%	0	0%	0	0%	0	0%	0	0%
<b>Total</b>			<b>435</b>	<b>0,9%</b>	<b>1</b>	<b>0,7%</b>	<b>0</b>	<b>0%</b>	<b>435</b>	<b>100%</b>	<b>0</b>	<b>0%</b>	<b>0</b>	<b>0%</b>
<b>4</b>	<b>Tax</b>	SEC Reg	7	53,8%	1	33,3%	0	0%	7	100%	7	100%	0	0%
		Accounting	6	46,2%	2	66,7%	0	0%	0	0%	0	0%	6	100%
<b>Total</b>			<b>13</b>	<b>0,0%</b>	<b>3</b>	<b>2,1%</b>	<b>0</b>	<b>0%</b>	<b>7</b>	<b>54%</b>	<b>7</b>	<b>54%</b>	<b>6</b>	<b>46%</b>
<b>5</b>	<b>Pension Benefits</b>	SEC Reg	639	27,2%	1	11,1%	639	100%	639	100%	0	0%	0	0%
		Accounting	1 714	72,8%	8	88,9%	821	48%	826	48%	0	0%	1 014	59%
<b>Total</b>			<b>2 353</b>	<b>4,9%</b>	<b>9</b>	<b>6,2%</b>	<b>1 460</b>	<b>62%</b>	<b>1 465</b>	<b>62%</b>	<b>0</b>	<b>0%</b>	<b>1 014</b>	<b>43%</b>
<b>6</b>	<b>Termination</b>	SEC Reg	1 431	99,3%	4	80,0%	1 382	97%	88	6%	1 431	100%	0	0%
		Accounting	10	0,7%	1	20,0%	0	0%	0	0%	0	0%	10	100%
<b>Total</b>			<b>1 441</b>	<b>3,0%</b>	<b>5</b>	<b>3,4%</b>	<b>1 382</b>	<b>96%</b>	<b>88</b>	<b>6%</b>	<b>1 431</b>	<b>99%</b>	<b>10</b>	<b>1%</b>
<b>SEC Regulations</b>			<b>33 289</b>		<b>51</b>		<b>14 841</b>		<b>10 731</b>		<b>19 401</b>		<b>3 172</b>	
<b>%</b>			<b>70%</b>		<b>35%</b>		<b>90%</b>		<b>72%</b>		<b>89%</b>		<b>23%</b>	
<b>Accounting Standards</b>			<b>14 282</b>		<b>94</b>		<b>1 562</b>		<b>4 148</b>		<b>2 425</b>		<b>10 707</b>	
<b>%</b>			<b>30%</b>		<b>65%</b>		<b>10%</b>		<b>28%</b>		<b>11%</b>		<b>77%</b>	
<b>Total</b>			<b>47 571</b>		<b>145</b>		<b>16 403</b>		<b>14 879</b>		<b>21 826</b>		<b>13 879</b>	



**Appendix A****Definition****Variables/Terms used**

Comment Letter	A document sent from the SEC to companies in response to corporate filings. The main purpose is to make the information contained in their registration statement, transparent and clear for investors. (Cunningham and Leidner 2022)
UPLOADS	Comment letters sent from the SEC to companies.
CORRESP	Responses from companies to SEC comment letters,
Issue phrases	Rules that the SEC usually refers to when commenting on firms' corporate disclosures via comment letters. These rules can be related to SEC regulations or accounting standards.
Precise issue phrases	Issue phrases that refer to specific rules, paragraphs or instructions (ex: Regulation S-K item 402(c)).
Imprecise issue phrases	Issue phrases that refer to a general topic (ex: Regulation S-K, Item 402) without referring to specific rules, paragraphs or instructions.
Issue types	General topics incorporating issue phrases (ex; Accounting).
Conversation ID Threads	A unique identifier attributed to all comment letters exchanged between the SEC and a given firm.
Initial compensation sample	The initial sample composed exclusively of compensation-related issue phrases. We create this sample by keeping letters that contain at least one issue phrase related to executive compensation.
Python I	A program that searches for all specific rules, paragraphs and instructions in comment letters.
Python II	A program that searches for all the key words associated to rules, paragraphs and instructions in comment letters.
Identified Threads	Conversation threads that contain exclusively precise issue phrases.
Non-identified threads	Conversation threads that contain exclusively imprecise issue phrases.
Hybrid threads	Conversation threads that contain precise and imprecise issue phrases.
Resolved Sample	Sample composed of conversation threads including precise and imprecise issue phrases of the same type (SEC regulations or accounting standards). We consider that this sample contains the complete information.
Testing Sample	Sample composed of conversation threads including precise and imprecise issue phrases of different type (SEC regulations or accounting standards). We run Python II on this sample in order to extract the remaining complete information.

## **Appendix B1:**

A conversation ID thread does not need further analysis in two cases:

1) The conversation ID thread contains precise issue phrases exclusively (120 Threads in Total)

Example 1: Precise issues exclusively<sup>47</sup>

**COMMENTLETTERCONVERSATIONID:** 1440

**Text rule:** APB Opinion No. 25 issues

*The conversation ID is composed of one letter and one precise accounting issue phrase.*

**Conclusion of example 1:** *No further examination is needed.*

2) The conversation ID thread contains both precise and imprecise issue phrases from the same type exclusively (Accounting standards or SEC Regulations)

Example 2: Accounting issues exclusively<sup>48</sup>

**COMMENTLETTERCONVERSATIONID:** 18

**Text rule** EITF 84-18 issues (Precise Accounting issue)

**Text rule** Deferred; stock based SFAS 123 only (subcategory) (Imprecise Accounting issue)

**Text rule** SAB 107 Issues (Precise Accounting issue)

**Text rule** Deferred, stock-based and/or executive comp issues (Imprecise Accounting issue)

**Text rule** SFAS 123(R) issues (Imprecise Accounting issue)

*The conversation ID is composed of Precise and Imprecise issue phrases belonging to the same type (Accounting issues in this case). Our qualitative tests show that the full information content of the conversation thread is provided by the precise issue phrases.*

**Conclusion of example 2:** *No further examination is needed.*

Example 3: SEC Regulations exclusively<sup>49</sup>

**COMMENTLETTERCONVERSATIONID:** 13

**Text rule** Regulation S-K, Item 402(a) issues (Precise SEC Regulation)

**Text rule** Regulation S-K, Item 402 issues (Imprecise SEC Regulation)

**Text rule** Executive compensation plan disclosure issues (Imprecise SEC Regulation)

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<sup>47</sup> <https://www.sec.gov/Archives/edgar/data/713425/000000000007028097/filename1.pdf>

<sup>48</sup> <https://www.sec.gov/Archives/edgar/data/1011028/000000000006028631/filename1.pdf>

<sup>49</sup> <https://www.sec.gov/Archives/edgar/data/1156833/000000000008013170/filename1.pdf>

The conversation ID is composed of Precise and Imprecise issue phrases belonging to the same type (SEC Regulations in this case). Our qualitative tests show that the full information content of the conversation thread is provided by the precise issue phrase Regulation S-K item 402(a).

**Conclusion of example 3:** No further examination is needed.

3) The conversation ID thread contains precise and imprecise accounting IP and imprecise SEC regulations.

Example 4: Precise Accounting IP + Imprecise Accounting IP + Imprecise SEC Regulations<sup>50</sup>

**COMMENTLETTERCONVERSATIONID:** 370

**Text rule** SFAS 123(R) (*Imprecise Accounting issue*)

**Text rule** Executive compensation plan disclosure issues (*Imprecise SEC Regulations*)

**Text rule** SFAS 123(R), paragraph(s) 58-63 (*Precise Accounting issue*)

**Text rule** Deferred, stock based SFAS 123 only (*Imprecise Accounting issue*)

**Text rule** Deferred, stock-based and/or executive comp issues (*Imprecise Accounting issue*)

*This conversation ID thread is composed of precise and imprecise accounting IP, and imprecise SEC Regulations. Our qualitative tests show that further examination is needed, as no precise SEC regulation IP is provided in the database. The text extraction shows the following:*

**“Executive Compensation, page 15**

Market Reference, page 15

21. We note your statement on page 16 that in **setting compensation** you considered information from various surveys including a published report from Mercer and “...other survey sources.” Please identify the other survey sources.

**Elements of the Executive Compensation Program, page 16**

**Short-Term Bonus Incentive Compensation, page 17**

22. On page 19 we note that you have decided to not set a cap on the amount of bonus that a named executive officer may earn under your Short-Term Bonus Incentive plan. Please discuss how the lack of a cap aligns the interests of shareholders and management. Also, please discuss if you believe that the lack of a cap encourages the named executive officers to take unnecessary risks and if you have any policies in place to prevent the named executive officers from taking unnecessary risks. Please discuss the basis for your belief.

Equity Compensation, page 19

23. We note your statement on page 19 that you have historically made **equity awards** on a discretionary basis at various times throughout the fiscal year. Please discuss the factors you consider when deciding at what time you will make an **equity award**.

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<sup>50</sup> <https://www.sec.gov/Archives/edgar/data/828747/000000000009016282/filename1.pdf>

**Summary Compensation Table**, page 23

24. In your Definitive Proxy Statement on Schedule 14A filed on October 16, 2007 several of the Named Executive Officers received discretionary cash bonuses. While in your Definitive Proxy Statement on Schedule 14A filed on October 8, 2008 you discuss a Short-Term Incentive plan. Please discuss how your **compensation program** changed from previous years and the steps that you took to decide to materially change your **compensation program**. For example, you should discuss why you paid the named executive officers a bonus in 2007, but not in 2008

Note 7. Intangible Assets, page 53

18. Please tell us your basis in GAAP for recognizing Old SSG tax benefits related to the exercise of stock options as a reduction of goodwill in light of the guidance in paragraphs **58 – 63 of SFAS 123(R)** and paragraph 30 of SFAS 109.”

**Conclusion of example 4:** *The full accounting information is conveyed by the precise accounting IP. However, the imprecise SEC Regulation IP does not transmit the total information contained in the conversation thread.*

**Appendix B2:**

**Regulation Item 403: Security ownership of certain beneficial owners and management.**

**(a) Security ownership of certain beneficial owners**

Furnish the following information, as of the most recent practicable date, substantially in the tabular form indicated, with respect to any person (including any “group” as that term is used in section 13(d)(3) of the Exchange Act) who is known to the registrant to be the beneficial owner of more than five percent of any class of the registrant's voting securities

**(b) Security ownership of management.**

Furnish the following information, as of the most recent practicable date, in substantially the tabular form indicated, as to each class of equity securities of the registrant or any of its parents or subsidiaries, including directors' qualifying shares, beneficially owned by all directors and nominees, naming them, each of the named executive officers as defined in Item 402(a)(3) (§ 229.402(a)(3)), and directors and executive officers of the registrant as a group, without naming them.

**(c) Changes in control.**

Describe any arrangements, known to the registrant, including any pledge by any person of securities of the registrant or any of its parents, the operation of which may at a subsequent date result in a change in control of the registrant.

**Appendix C1: This table shows the different issue types and their frequencies in the original data**

Number	issue_type	Freq.	Percent
1	ACCOUNTING	175 633	18,06%
2	DISCLOSU	6 963	0,72%
3	EITFGAAP	9 004	0,93%
4	EVENTDIS	32 570	3,35%
5	EXCHANGE	22 772	2,34%
6	FASBACCO	696	0,07%
7	FASBCONC	209	0,02%
8	FEDERALS	7 293	0,75%
9	FINGUIDA	2 466	0,25%
10	FSPGUIDA	744	0,08%
11	FTBGUIDA	246	0,03%
12	IASREFER	4 348	0,45%
13	IFRINTER	55	0,01%
14	IFRSREFE	1 687	0,17%
15	INVESTAD	6	0,00%
16	INVESTCO	508	0,05%
17	LEGALMAT	6 312	0,65%
18	MANAGEMENT	85 064	8,75%
19	OTHERDIS	119 686	12,31%
20	PCAOBRUL	1 659	0,17%
21	REGISTRA	155 156	15,96%
22	REGULATI	481	0,05%
23	REGULMAR	5 229	0,54%
24	REGULSKR	106 091	10,91%
25	REGULSXR	41 232	4,24%
26	RISKFACT	40 241	4,14%
27	SABGUIDA	14 896	1,53%
28	SECRELEA	15 465	1,59%
29	SECURITI	18 356	1,89%
30	SFASGAAP	50 603	5,20%
31	SICREFER	20	0,00%
32	SOPAICPA	2 685	0,28%
33	TENDEROF	4 655	0,48%
34	WHOLELET	39 286	4,04%
	Total	972 317	100,00%

**Appendix C2: This table contains the issue phrases of the initial compensation sample and their frequencies.**

**Number 1 till Number 48 constitute Accounting Standards**

**Number 49 till number 72 constitute SEC Regulations**

**Highlighted issue phrases correspond to the “imprecise issue phrases”**

Num	Issue Phrase	Interpretation	Issue type	Frequency
1	Deferred, stock based SFAS 123 only (subcategory)		ACCOUNTING	2 476
2	Deferred, stock-based and/or executive comp issues		ACCOUNTING	8 484
3	Deferred, stock-based options backdating only		ACCOUNTING	63
4	EITF 00-23 issues	Issues Related to the Accounting for Stock Compensation under APB Opinion No. 25 and FASB Interpretation No. 44	EITFGAAP	49
5	EITF 04-12 issues	Determining Whether Equity-Based Compensation Awards Are Participating Securities	EITFGAAP	4
6	EITF 84-18 issues	Stock Option Pyramiding	EITFGAAP	1
7	EITF 95-16 issues	Accounting for Stock Compensation Arrangements with Employer Loan Features under APB Opinion No. 25	EITFGAAP	2
8	FIN 28 issues	Accounting for Stock Appreciation Rights and Other Variable Stock Option or Award Plans	FINGUIDA	20
9	FIN 38 issues	Determining the Measurement Date for Stock Option, Purchase, and Award Plans Involving Junior Stock	FINGUIDA	3
10	FSP FAS 123(R)-3 issues	Transition Election Related to Accounting for the Tax Effects of Share-Based Payment Awards	FSPGUIDA	2
11	FSP FAS 123(R)-4 issues	Classification of Options and Similar Instruments Issued as Employee Compensation That Allow for Cash Settlement upon the Occurrence of a Contingent Event	FSPGUIDA	5
12	FSP FAS 123(R)-5 issues	Amendment of FASB Staff Position FAS 123(R)-1	FSPGUIDA	1
13	FSP FAS 123(R)-6 issues	Technical Corrections of FASB Statement No. 123(R)	FSPGUIDA	1
14	FSP FAS 150-4 issues	Issuers' Accounting for Employee Stock Ownership Plans under	FSPGUIDA	1

		FASB Statement No. 150		
15	IFRS 2 issues	Share-Based Payment	IFRSREFER	86
16	IFRS 2, paragraph(s) 10-29 issues	Share-Based Payment	IFRSREFER	8
17	IFRS 2, paragraph(s) 30-33 issues	Share-Based Payment	IFRSREFER	3
18	IFRS 2, paragraph(s) 34-43 issues	Share-Based Payment	IFRSREFER	2
19	IFRS 2, paragraph(s) 44-52 issues	Share-Based Payment	IFRSREFER	35
20	IFRS 2, paragraph(s) 53-59 issues	Share-Based Payment	IFRSREFER	1
21	IFRS 2, paragraph(s) 7-9 issues	Share-Based Payment	IFRSREFER	1
22	IFRIC 8 issues	Scope of IFRS 2 (Share-Based Payment) clarifies that IFRS 2 applies to arrangements where an entity makes share-based payments for apparently nil or inadequate consideration.	IFRINTER	2
23	SAB 107 Issues	the interaction between Statement of Financial Accounting Standards Statement No. 123 (revised 2004), Share-Based Payment and certain Securities and Exchange Commission rules and regulations and provides the staff's views regarding the valuation of share-based payment arrangements for public companies.	SABGUIDA	168
24	SAB 110 issues	This staff accounting bulletin ("SAB") expresses the views of the staff regarding the use of a "simplified" method, as discussed in SAB No. 107 ("SAB 107"), in developing an estimate of expected term of "plain vanilla" share options in accordance with Statement of Financial Accounting Standards No. 123 (revised 2004), Share-Based Payment.	SABGUIDA	21
25	SAB Topic 14 issues	Share-Based Payment	SABGUIDA	571
26	SAB Topic 14:D issues	Certain Assumptions Used in Valuation Methods	SABGUIDA	180
27	SAB Topic 14:F issues	Classification of Compensation Expense Associated with Share-Based Payment Arrangements	SABGUIDA	233

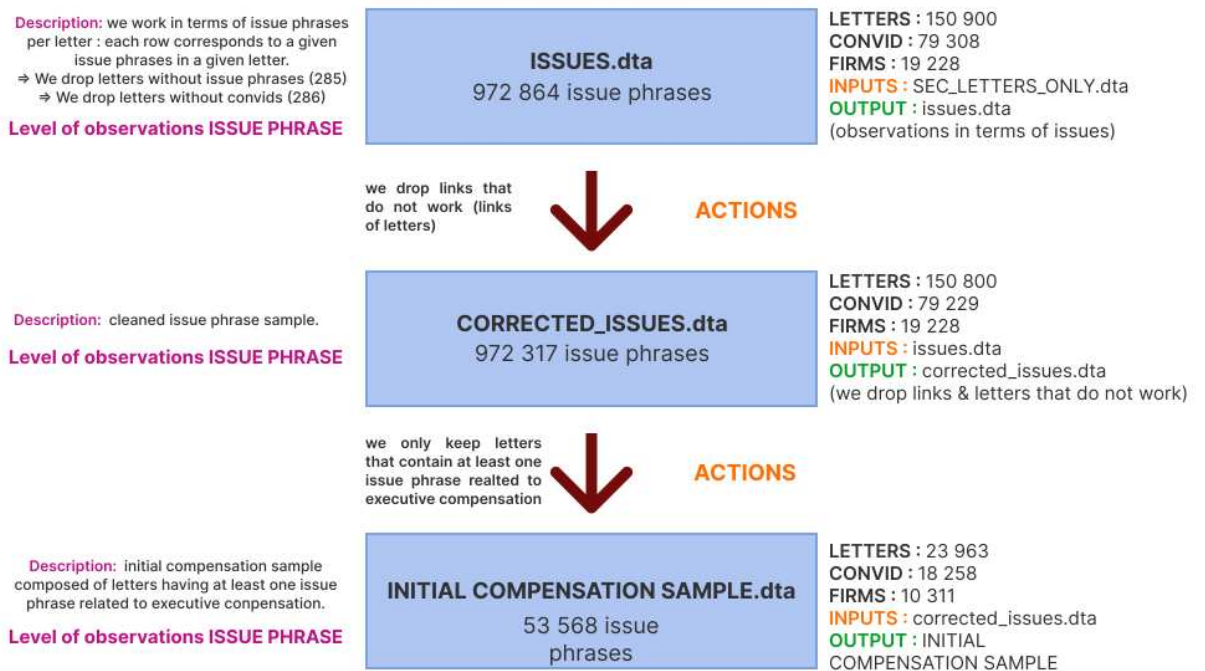


28	APB Opinion No. 25 issues	Accounting for stock issued to employees	SFASGAAP	260
29	SFAS 123(R) issues	Share-Based Payment	SFASGAAP	1 863
30	SFAS 123(R), paragraph(s) 39-42	Share-Based Payment	SFASGAAP	24
31	SFAS 123(R), paragraph(s) A18-22	Share-Based Payment	SFASGAAP	32
32	SFAS 123(R), paragraph(s) A240-242	Share-Based Payment	SFASGAAP	560
33	SFAS 123 issues	Share-Based Payment	SFASGAAP	900
34	SFAS 123, paragraph(s) 16-25	Share-Based Payment	SFASGAAP	54
35	SFAS 123, paragraph(s) 26-33	Share-Based Payment	SFASGAAP	21
36	SFAS 123, paragraph(s) 45-48	Share-Based Payment	SFASGAAP	257
37	SFAS 148 issues	Accounting for Stock-Based Compensation—Transition and Disclosure—an amendment of FASB Statement No. 123	SFASGAAP	184
38	ASU No. 2016-09	Compensation—Stock Compensation (Topic 718): Improvements to Employee Share-Based Payment Accounting	FASBACCO	16
39	Pension and related Employee Plan issues		ACCOUNTING	1 594
40	SFAS 132 issues	Employers' Disclosures about Pensions and Other Postretirement Benefits—an amendment of FASB Statements No. 87, 88, and 106	SFASGAAP	19
41	SFAS 132(R) issues	Employers' Disclosures about Pensions and Other Postretirement Benefits—an amendment of FASB Statements No. 87, 88, and 106	SFASGAAP	122
42	SFAS 87 issues	Employers' Accounting for Pensions	SFASGAAP	126
43	IAS 19 issues	Employee Benefits	IASREFER	82
44	IAS 19, paragraph(s) 132-143 issues	Explanation of amounts in the financial statements	IASREFER	10
45	IAS 19, paragraph(s) 43-47 issues	State plans	IASREFER	1
46	IAS 19, paragraph(s) 48-119 issues	Recognition and measurement: plan assets	IASREFER	18
47	IAS 19, paragraph(s) 7 issues	SCOPE	IASREFER	1
48	IAS 19, paragraph(s) 8-23 issues	Recognition and measurement	IASREFER	4
49	Executive compensation plan disclosure issues		MANAGEME	14 125

50	Regulation S-K, Item 403 issues	Security ownership of certain beneficial owners and management.	REGULSKR	1 412
51	Regulation S-K, Item 402 issues	Executive compensation.	REGULSKR	7 570
52	SEC Release No. 33-8655	(EXECUTIVE COMPENSATION) RELATED PARTY DISCLOSURE	SECRELEA	1
53	SEC Release No. 33-8732	(EXECUTIVE COMPENSATION) RELATED PERSON DISCLOSURE	SECRELEA	31
54	SEC Release No. 33-8732A	(EXECUTIVE COMPENSATION) RELATED PERSON DISCLOSURE	SECRELEA	664
55	SEC Release No. 34-54302A	(EXECUTIVE COMPENSATION) RELATED PERSON DISCLOSURE	SECRELEA	31
56	Employment Agreements		REGISTRA	2 951
57	Regulation S-K, Item 402(b) issues	Compensation Discussion and Analysis	REGULSKR	3 847
58	Regulation S-K, Item 402(b), Instruction 4 issues	Disclosure of target levels	REGULSKR	1 875
59	SEC Release No. 33-9178	SHAREHOLDER APPROVAL OF EXECUTIVE COMPENSATION AND GOLDEN PARACHUTE COMPENSATION	SECRELEA	12
60	Exchange Act Rule 14a-21 issues	Shareholder approval of executive compensation, frequency of votes for approval of executive compensation and shareholder approval of golden parachute compensation	EXCHANGE	76
61	Regulation S-K, Item 402(s) issues	Narrative disclosure of the registrant's compensation policies and practices as they relate to the registrant's risk management.	REGULSKR	648
62	SEC Release No. 34-45189	Disclosure of Equity Compensation Plan Information	SECRELEA	3

63	SEC Release No. 33-8568	AMENDMENT TO RULE 4-01(a) OF REGULATION S-X REGARDING THE COMPLIANCE DATE FOR STATEMENT OF FINANCIAL ACCOUNTING STANDARDS NO. 123 (REVISED 2004), SHARE-BASED PAYMENT	SECRELEA	6
64	SEC Release No. 33-8765	Option Disclosure Requirements	SECRELEA	28
65	SEC Release No. 34-56010	Exemption of Compensatory Employee Stock Options From Registration Under Section 12(g) of the Securities Exchange Act of 1934	SECRELEA	1
66	SEC Release No. 34-55009	stock option reporting	SECRELEA	2
67	SEC Release No. 34-32723	Stock Option Exercises and Holdings	SECRELEA	12
68	SEC Release No. 33-7009	Stock Option Exercises and Holdings	SECRELEA	18
69	Compensation or benefits of executives from offering, disclosure issues		REGISTRA	1 481
70	Regulation M-A, Item 1009 issues	Persons/assets, retained, employed, compensated or used.	REGULMAR	57
71	Regulation S-K, Item 702 issues	Indemnification of directors and officers.	REGULSKR	87
72	Risk Factors - Compensation levels and expense		RISKFACT	59

**Figure 1: Getting to the initial compensation sample**



**Figure 2: The composition of the initial compensation sample**

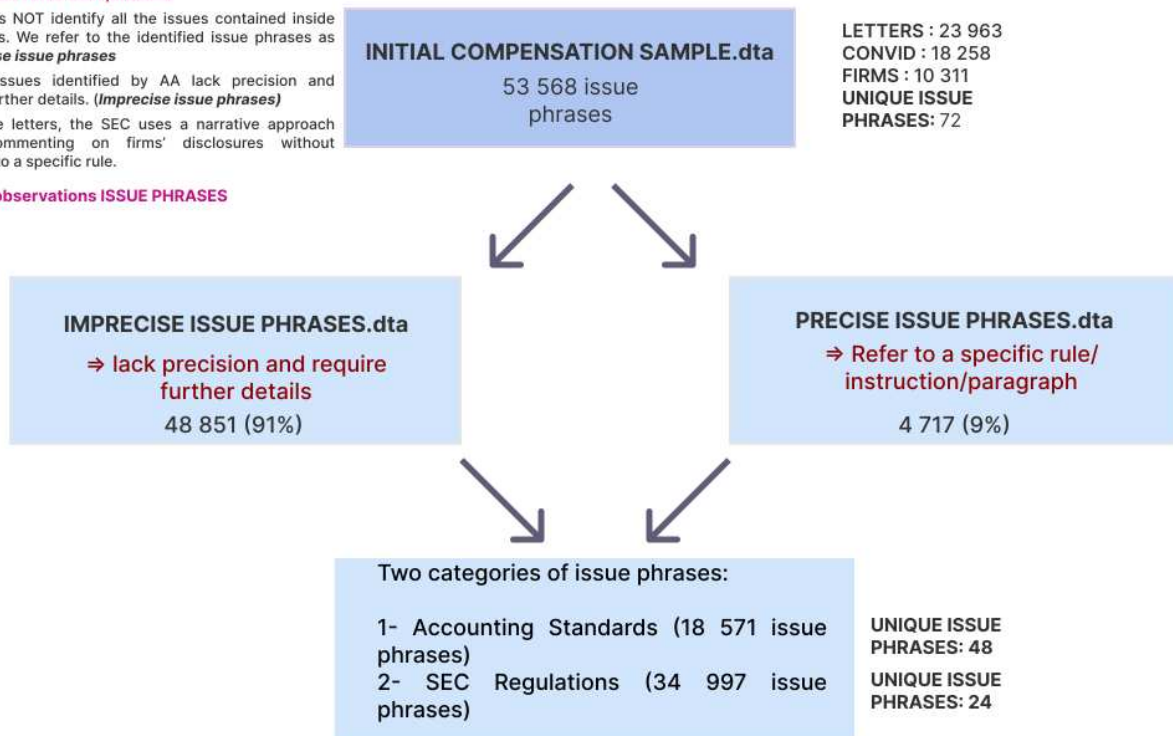
**Description: Three main problems**

⇒ AA does NOT identify all the issues contained inside the letters. We refer to the identified issue phrases as the **precise issue phrases**

⇒ Some issues identified by AA lack precision and require further details. (**Imprecise issue phrases**)

⇒ In some letters, the SEC uses a narrative approach when commenting on firms' disclosures without referring to a specific rule.

**Level of observations ISSUE PHRASES**



⇒ For these reasons, we need to identify all the hidden and missing precise rules

⇒ We build a program named "Python I" that searches for all the specific rules/instructions/paragraphs, contained in the **23 963 letters**

**Figure 3: Python I**

**Description: Three main problems**

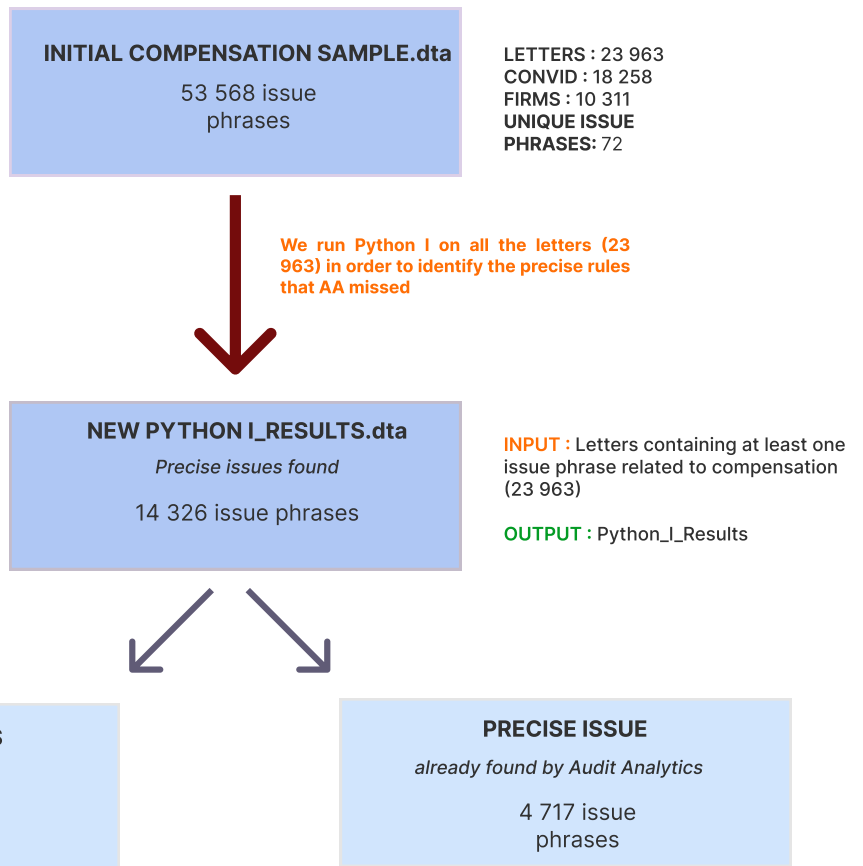
⇒ AA does NOT identify all the issues contained inside the letters. We refer to the identified issue phrases as the *precise issue phrases*

⇒ Some issues identified by AA lack precision and require further details. (*Imprecise issue phrases*)

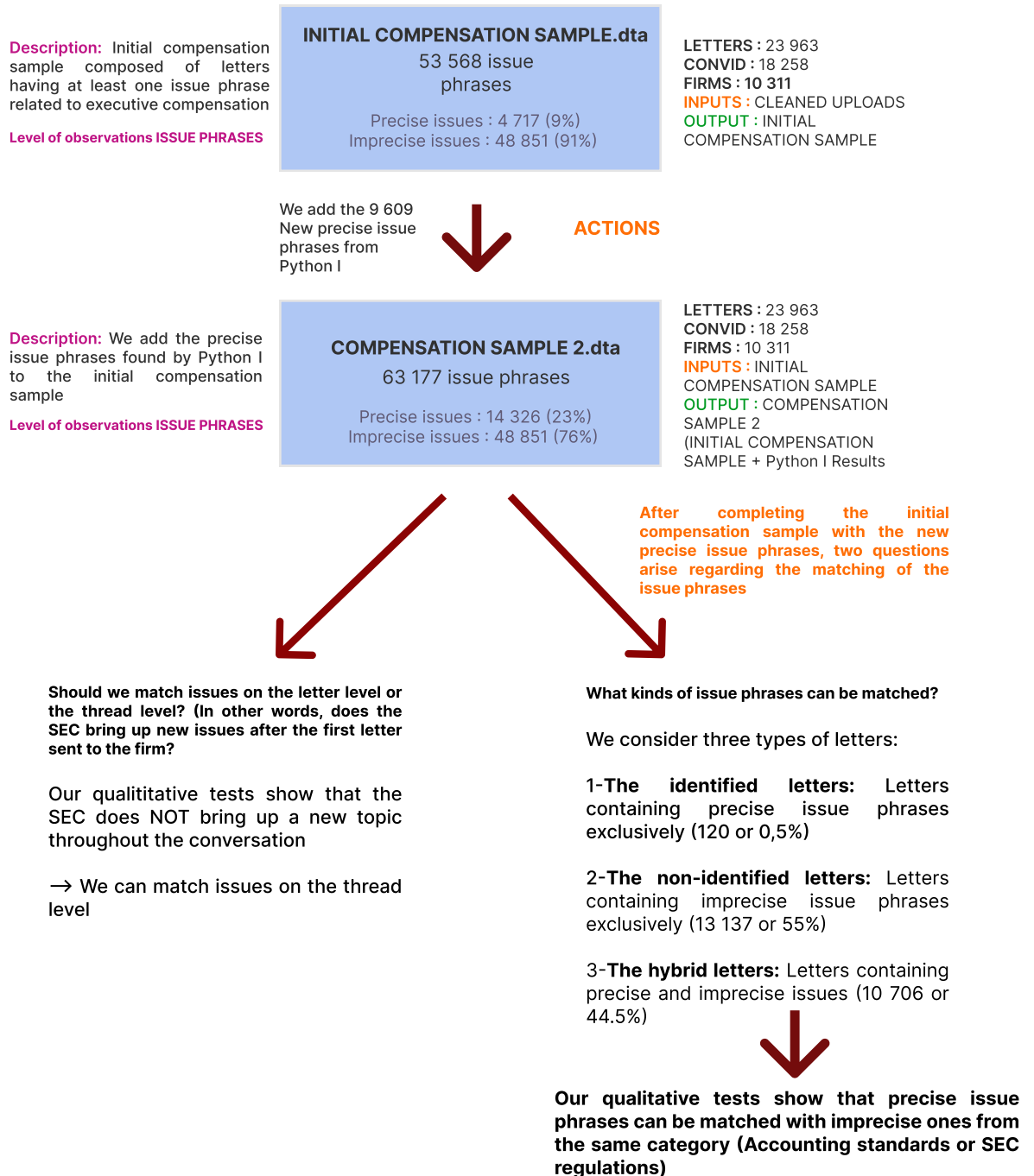
⇒ In some letters, the SEC uses a narrative approach when commenting on firms' disclosures without referring to a specific rule.

**Description:** A program designed to search for all specific rules/instructions/paragraphs contained in all the letters related to executive compensation

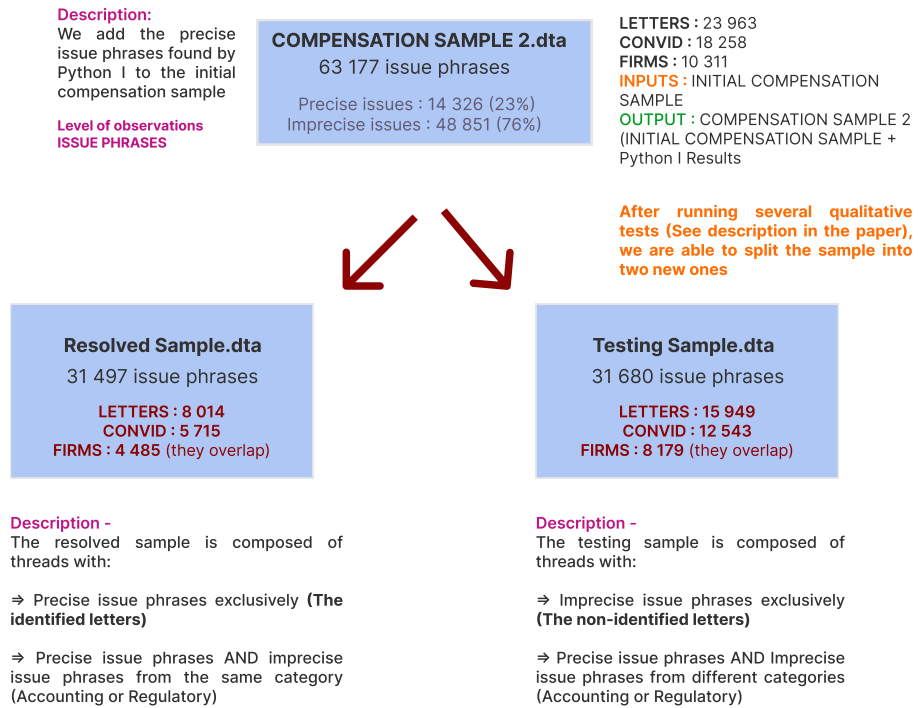
**Level of observations ISSUE PHRASES**



**Figure 4: Compensation Sample 2**

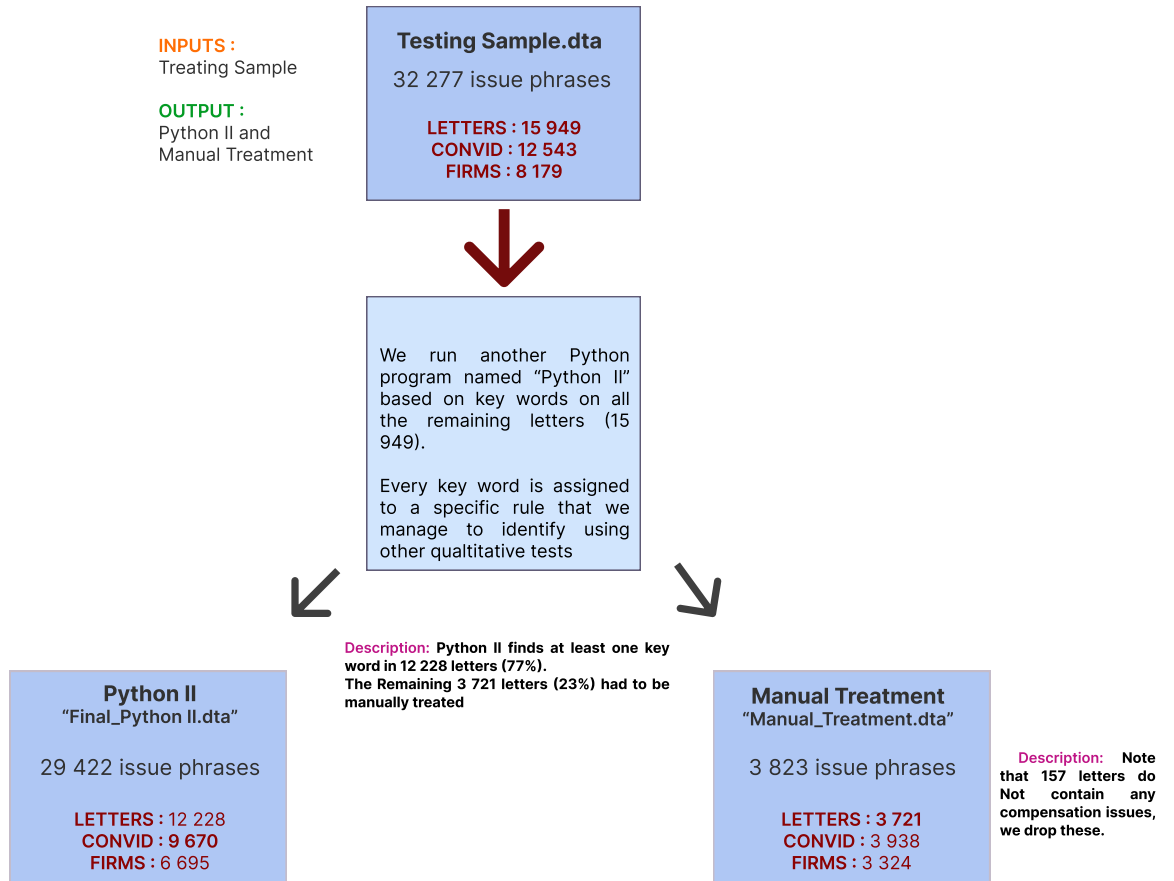


**Figure 5: Resolved vs Testing Sample**

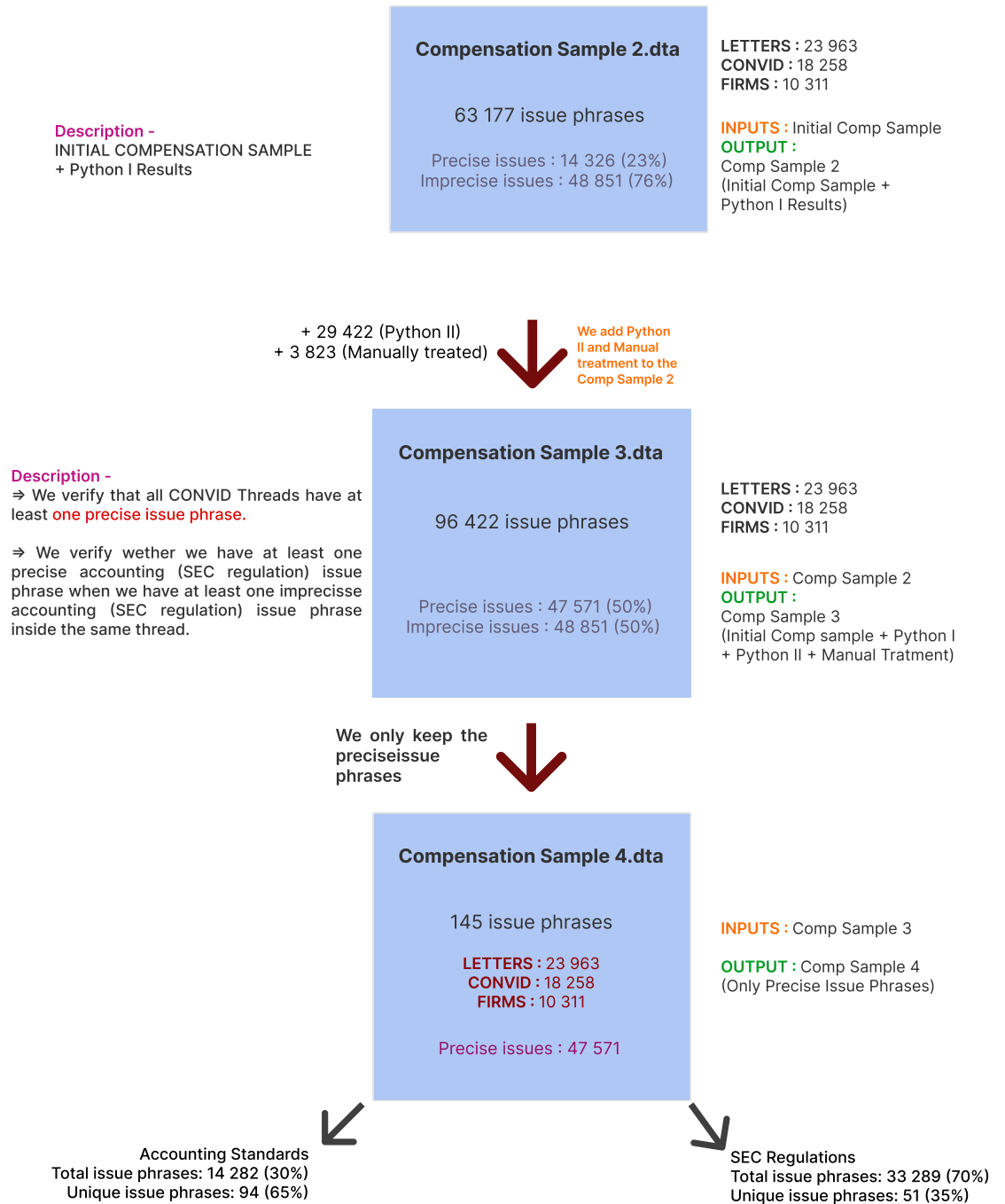




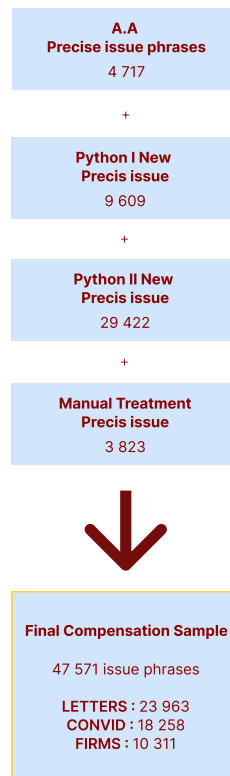
**Figure 6: Testing Sample**



**Figure 7: Completing the Sample with Python II and Manually treated issue phrases**



**Figure 8: Composition of Final Compensation Sample**



# Chapter 3

## The effect of executive compensation characteristics on the receipt of SEC comment letters

The work presented in this chapter is co-authored with Helen Bollaert (SKEMA Business School), Timothy King (University of Vaasa) and Florencio Lopez de-Silanes (SKEMA Business School)

We investigate the determinants of receiving a compensation comment letter (CCL) sent by the Securities and Exchange Commission (SEC) to U.S firms using a unique new database. We define external compensation characteristics as the deviation from expected compensation given firm and industry characteristics. Internal compensation characteristics correspond to pay disparities within the top management team. We find that external and internal compensation characteristics increase the probability of receiving an SEC comment letter related to executive compensation. We further show that greater external and internal divergences in executive compensation are associated with a larger number of compensation related comment letters and compensation issue phrases with the SEC. Comments received concern the compensation package as a whole, as opposed to its individual components and are related to the justification of compensation policies and practices. We also examine outcomes resulting from receipt of a CCL. We find that receipt of a CCL increases the probability of CEO turnover. Finally, we find that when the CEO is retained, changes in internal and external CEO compensation characteristics are negatively associated with the receipt of CCLs. Cross-sectional results indicate that these changes are concentrated in firms with less powerful CEOs.

### **3.1 Introduction**

In 2006, the Securities exchange commission (SEC) voted to adopt changes to the rules requiring companies to disclose information regarding executive pay packages in their annual proxy statements. The change in rules led to more SEC scrutiny, which generated correspondence. In total, the SEC received 20,000 comment letters in response to its proposals. The change in rules was motivated by two important reasons. First, previous executive compensation rules did not provide investors with accurate and complete information despite the substantial changes experienced by compensation packages awarded to directors and executives (Cox 2006). The second important reason relates to the option-backdating scandal and the significant payouts and severance packages attributed to executives. Since then, the number of compensation comment letters (CCL) have greatly increased reaching a peak in 2010 (Ryans 2021) and CCLs have received significant attention in the literature (Robinson et al. 2011, Laksmana et al. (2012), Chen et al. 2020, Yang 2021, Wang et al 2022). However, despite the volume of comment-letter related research, little is known about why firms receive compensation-related comment letters and which companies are targeted by the SEC using these letters. The purpose of this paper is to address this gap in the literature by examining the determinants of receiving a compensation comment letter (CCL). Moreover, we analyze CCL characteristics and the subsequent changes in executive compensation characteristics.

Several studies investigate the determinants of receiving a comment letter (Johnston and Petacchi 2012, Cassel et al. 2013, Heese et al. 2017). These papers have identified several factors affecting the propensity of receiving a 10-K comment letter. The authors refer to the SOX section 408 paragraph (b) that states that the SEC shall consider specific factors before targeting firms. The SEC seems to be targeting firms that have issued material restatements of financial results, companies that have encountered relatively high levels of volatility in their stock price and firms with the largest market capitalization. Moreover, the SEC scrutinizes companies with significant differences in price-to-earnings ratios and whose operations have a critical impact on any material sector of the economy. Papers have also considered other factors related to firms' characteristics related to profitability, financial distress, company complexity and external financing. Governance characteristics have also been examined such as CEO and CFO/Chairman duality, the percentage of independent directors and CEO/CFO tenures. However, none of these papers investigate in their analysis, factors related to executive compensation characteristics. Considering these factors can be greatly interesting as "no issue in the 72 years of the Commission's history has generated such interest" (Cox 2006).

Several studies examining CCLs have used CEO excess compensation to measure the changes in compensation after the receipt of a CCL (Robinson et al. 2011; Wang et al. 2022). This measure is defined as the difference between actual CEO compensation and expected CEO compensation derived from economic determinants of CEO compensation and industry controls (Core et al. 2008). These studies suggest that the SEC is interested in external compensation characteristics. However, the various SEC press releases and subsequent legal and accounting reports related to the new rules highlight the importance of internal compensation characteristics. Precisely, the new rules require firms to disclose compensation information regarding all the top executives in tabular and narrative format. The new compensation discussion and analysis section includes several requirements related to the role of executive officers in the compensation process, the objectives and structure of the compensation program, the determination of each element of compensation and the allocation of cash and equity-based compensation. These SEC requests give us reasons to investigate the impact of internal compensation characteristics on the receipt of a CCL.

To test our conjectures, we estimate both internal and external compensation characteristics. Internal characteristics concern the compensation divergences within the top management team. We estimate these disparities using the CEO pay gap, computed as the difference between the CEO's total compensation and the mean compensation of the next four best paid executives (Henderson and Fredrickson 2001). We consider the CEO pay slice, defined as the proportion of the top-five top management team (TMT) members' compensation captured by the CEO (Bebchuk et al. 2011). Finally, we estimate TMT pay disparity, represented as the standard deviation of total pay of TMT members divided by the average of their total pay (Fredrickson et al., 2010; Siegel and Hambrick, 2005; Lim 2019). These three measures account for CEOs' dominance within the top executive team.

We define external compensation characteristics as deviation from expected compensation given firm and industry characteristics. We add to the existing literature by proposing excess CEO pay gap, excess CEO pay slice and excess TMT pay disparity measures, based on the methodology of Core et al. (2008). These new measures are constructed in order to complement the widely used CEO excess compensation measure. The results of our analysis document a positive and significant association between internal and external compensation characteristics and the probability of receiving a compensation comment letter. This suggests that the SEC appears to target firms managed by over-compensated CEOs relatively to their peers, but also dominant CEOs within their firm. This result is in line with Cheng et al. (2014) who find that the SEC targets companies with strong CEOs and weak monitoring.

Next, we examine the impact of compensation characteristics on CCL properties. We find a positive and significant relation between internal and external CEO compensation characteristics and the number of letters and issue phrases received by a firm. This suggests that firms with higher internal and external CEO compensation divergences tend to receive more letters and more issue phrases<sup>51</sup> related to SEC regulations from the SEC. We also show that these firms take more time to resolve the issues related to their disclosures brought up by the SEC. This result is in line with Robinson et al. (2011) who document a positive association between CEO excess compensation and the number of “defects” (issue phrases) received by a firm. Moreover, we show that the letters received by these firms are related to the whole compensation package and to the justification of compensation policies and practices. Finally, we investigate the impact of compensation comment letters on subsequent changes in compensation and CEO characteristics. Our results display a negative significant relationship between the receipt of a CCL and subsequent changes in executive compensation characteristics, in line with Wang et al. (2022). We also document that CCLs increase CEO turnover (in line with Gietzmann et al. 2016). Cross-sectional results indicate that this negative change concerns less powerful CEOs (in line with Wang et al. 2022).

This study makes several contributions to the literature. First, prior studies examining the determinants of receipt of a comment letter find that factors related to SOX section 408 paragraph (b), firm characteristics and governance characteristics affect the probability of receiving a comment letter (Johnston and Petacchi 2012, Cassel et al. 2013, Heese et al. 2017). We complement this line of studies by investigating the role played by external and internal compensation characteristics on the propensity of receiving a CCL. Our findings suggest that firms with high levels of internal and external disparities in CEO compensation have a high likelihood of receiving a CCL. Second, the only study examining the association between SEC comments and executive compensation (Robinson et al. 2011), account exclusively for external CEO compensation characteristics. More specifically, the authors study the relationship between the number of compensation-related comments and excess CEO compensation. In our paper, we underline the role played by internal compensation characteristics regarding compensation comment letters by using measures related to CEO dominance within the top executive team. Regarding external compensation characteristics, we complement excess CEO compensation with excess CEO pay gap, excess CEO pay slice and excess TMT pay disparity. Using both internal and external measures enable us to shed light on the role of CEO

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<sup>51</sup> Comments made by the SEC to firms regarding their disclosure, containing specific rules to follow and/or explanations associated to these rules.

compensation disparities within firms and relatively to industries, on the receipt of CCLs. Third, papers exploring CCLs have focused exclusively on a part of issue phrases related to SEC regulations (Robinsons et al. 2011 and Wang et al. 2022). Our study is conducted using a novel dataset containing the complete set of compensation issue phrases related to SEC regulations and accounting standards. This dataset enable us to analyze more regulation issue phrases than previous papers.

Finally, our study contributes to the literature on disclosure regulations by highlighting the effectiveness of the SEC comment letter process in line with Bozanic et al. (2017). We find that the receipt of a comment letter decreases subsequent changes in internal and external disparities in CEO compensation. We also find that the receipt of a CCL increases the probability of CEO turnover.

The remainder of this paper is organized as follows. Section 3.2 details the literature review the hypothesis development. Section 3.3 discusses the sample selection, variables of interests and research design. Section 3.4 reports the results of our study. Section 3.5 concludes the paper.

## **3.2. Literature Review and Hypothesis development**

### *3.2.1 Institutional background*

In 2006, the Securities Exchange Commission (SEC) voted to adopt changes to the rules related to the disclosure of executive and director compensation, corporate governance matters, security ownership of officers and directors and related person transactions. These modifications affected annual reports, disclosure in proxy statements, registration statements and reporting of compensation arrangements. The objective was to provide investors with high quality, clear and useful information about executive compensation (Cox 2006).

The new rules had several requirements linked to compensation policies and practices of top executives and directors. Firms were required to provide information related to the different compensation components attributed to executives in specific formatted tables. Precisely, several tables were requested by companies such as the summary compensation table (Regulation S-K, Item 402(c and n)), grants of plan-based awards table (Regulation S-K, Item 402(d)), outstanding equity awards at fiscal year-end table (Regulation S-K, Item 402(f and p)), option exercises and stock vested table (Regulation S-K, Item 402(g)), Pension benefits (Regulation S-K Item 402(h)), non-qualified defined contribution and other nonqualified deferred compensation plans (Regulation S-K, Item 402(i)) and golden parachute



compensation (Regulation S-K, Item 402(t)). Companies were also instructed to complement information in tables with narrative description “of any additional material factors necessary to an understanding of the information disclosed in tables” (Regulation S-K, Item 402(e and o)). In addition, a new Compensation discussion and analysis (CD & A) section was designed (Regulation S-K, Item 402(b)) that required firms to describe the objectives of their compensation programs and list and justify the use of each element of executive compensation. Moreover, the SEC also demanded also a clear illustration of the formulas used to determine the amounts related to each compensation element.

Regarding accounting standards, firms are expected to furnish information related to equity-based awards’ valuation methods and assumptions (FAS 123) and measurement and recognition of compensation costs. Precisely, firms are required to address several objectives. First, the nature and terms of share-based payment arrangements and the effect of the related compensation cost on the income statement. Companies are also expected to present the method of estimating the fair value of equity instruments granted and the assumptions (volatility, expected term, dividend yield) used to determine the numbers. Then, Firms should justify the use of the methodology, provide the type of stock option grants for which the method was used and precise the periods for which the method was used. Finally, firms are requested to disclose the cash flow effects resulting from share-based payment arrangements.

After the receipt of a CCL, companies are supposed to address each comment identified in a response letter. Then, firms’ responses are evaluated by the SEC that may send several follow-up letters until it considers that all material issues are resolved. The final step for the SEC, consists of posting the relevant communications on their website, after it is satisfied with all the responses it received by a given firm.

### *3.2.2 SEC Comment letters literature*

The rapidly growing body of literature examining comment letters is divided into three main parts (Cunningham and Leidner 2022). In the first part, several studies examine the determinants of receipt of a comment letter (CL) (Cassel et al. 2013, Heese et al. 2017, Boone et al. 2013, Gunny and Hermis 2020). These papers take into account factors set forth in SOX section 408 paragraph (b), and other factors related to firm, accounting and governance characteristics. The second part of the literature concerns comment letter resolution. Papers investigate aspects related to comment letters, such as time to resolution of a conversation threads (or the number of rounds), the number of letters received and the topics and contents of received letters (Cassel et al. 2013, Heese et al. 2017, Robinson et al. 2011). The final part

of the CL literature is composed of studies investigating the consequences of CLs. These papers explore market reactions to comment letter correspondence (Dechow et al. 2016, Ryans 2021), changes to future disclosures or accounting applications (Robinson et al. 2011, Bozanic et al. 2017, Wang et al. 2022) and changes in top management (Cheng et al. 2014, Gieztmann et al. 2016). We summarize findings of the main papers in table 1.

[Insert table 1 about here]

In the first part, related studies take into consideration six criteria identified by SOX section 408 paragraph (b). These include firms with material restatements, high share price volatility, large market capitalization, companies with disparities in price-to-earnings ratios, firms with operations that affect a material sector of the economy and other factors considered important by the SEC. These papers also look at specific types of topics and comments. Cassel et al. (2013) investigate factors that affect the probability of receiving a comment letter, the extent of comment received and the cost of remediation. They find that financial statement restatements and high stock return volatility increase the probability of receiving a CL. They also find a significant positive association between the receipt of a comment letter and company age, company complexity (M&A activity and the number of segments), the probability of bankruptcy, incidence of losses and weaker governance. However, the authors document a negative association with the extent of external financing. The study also reports a positive association between the number of comment topics and financial statement restatements, companies reporting losses, more complex firms, and enterprises with few independent directors. Heese et al. (2017) examine the impact of firms' political connections on the likelihood of receiving a CL. The authors find that politically connected firms are more likely to receive a CL. They also document that politically connected firms receive more core and non-core earnings topics, take more time and rounds to resolve the comments and are more likely to involve a supervisor. Despite focusing on the informational consequences of comment letters, Johnston and Petacchi (2017) examine the determinants of receipt of a comment letter and find similar results (Appendix A1 of the paper). Gunny and Hermis (2020) investigate the impact of busyness on the frequency, scope and timeliness of comment letters. They find that firms with a December fiscal year-end have a lower probability of receiving a comment letter than firms with a non-December fiscal year end. Cunningham et al. (2020) examine companies' earnings management in the event of an SEC comment letter and find no association between earnings management and the subsequent receipt of a comment letter (table 5 of the paper). Regarding Compensation-related comment letters, to our knowledge, no paper examines the determinants of receipt of a CCL. However, Robinson et al. (2013) investigate the impact of

CEO excess compensation on the number of “defects” (comments from the SEC) received by a firm. In a sample composed exclusively of firms having received a CCL, they find a significantly positive association between CEO excess compensation and the number of compensation-related comments from the SEC. Furthermore, they show that the SEC’s comments are related to pay-performance and governance issues.

The second part of the literature focuses on comment letter resolution. This part involves the duration of the process (number of days, rounds) and the various determinants of resolution such as the number and type of comments. Researchers have analyzed the cost of remediation in terms of the total number of days, rounds or letters. The factors explaining remediation are often the same ones used for the determination of receipt of a comment letter. Overall, papers find a positive and significant relationship between the probability of restatement or amendment and the number of initial comments made to firms by the SEC, smaller firms, companies with weak financial situation, complex companies (proxied by M&A activity and the number of segments), firms with smaller auditors, when the readability of companies’ responses is complex, and when the SEC review team includes an accountant (Baugh et al. 2020, Cassel et al. 2013, Cassel et al. 2019). Heese et al. (2017) find that comment letters addressed to politically connected firms include more core and non-core earnings topics, take more time to be resolved and are more likely to involve a supervisor.

The third part of the literature is related to the consequences of comment letter receipt. That is, market reactions and the various changes made by firms after the receipt of a comment letter. These changes concern future disclosures, accounting applications, audit fees, management turnover and executive compensation. Papers examining firms’ market reactions reach different conclusions suggesting that comment letters do not imply clearly good or bad news on average (Dechow et al. 2016; Johnston and Petacchi 2017). Dechow et al. (2016) focus on letters related to revenue recognition and find a small negative stock price response on the day and the day following the release of a comment letter. They also find significant negative cumulative abnormal returns of one percent in the 50 days following the comment release date. Johnston and Petacchi (2017) investigate the impact of SEC comment letters on the informational environment. They find no evidence that the market negatively interprets the receipt of a comment letter, and that CLs can improve the firm’s information environment. Cunningham et al. (2020) explore the effect of comment letters on accounting quality in terms of earning management. They find that the receipt of a CL leads firms’ managers to switch from accrual-based earnings management (AEM) to real-activities based earnings management (REM). Ryans (2021) adopts a textual analysis approach and finds that textual and quantitative

classification predict future restatements, write downs and earnings. Several papers investigate other changes made by firms after the receipt of a CL. Kubick et al. (2016) find that firms receiving a tax-related comment letter decrease subsequently their tax avoidance behavior. Bozanic et al. (2017) find that the SEC comment letter process improves firms' disclosures, informational transparency and reduces companies' litigation risk. Regarding executive compensation, Robinson et al. (2011) find no significant relationship between CCL characteristics and changes in excess compensation. However, Wang et al. (2022) find that the number of defects identified in CCLs is negatively associated with changes in excess compensation. This suggest that the receipt of a comment letter leads to a decrease in excess CEO compensation. Chen et al. (2020) find that the receipt of revenue recognition related comment letters leads to a significant decrease in CEO annual bonuses. This relationship is more pronounced for high-growth firms with less powerful CEOs and with non-transient institutional investors. Yang (2021) finds a negative (positive) association between compensation disclosure transparency and managerial power and proprietary cost (external monitoring). Moreover, Gietzmann et al. (2016) find an increase in CFO turnover after the receipt of a comment letter. Cheng et al. (2014) find that firms with restatements prompted by the SEC have a higher probability of terminating strong CEOs after the discovery of restatements. Laksmana et al. (2012) find that management increase readability of the Compensation discussion and analysis (CD&A) section after the receipt of comments and criticisms from the SEC.

### *3.2.3 Executive compensation characteristics*

Managerial power theory suggests that powerful managers exercise their influence over the board in order to set up their own compensation and extract additional rents from their firms (Bebchuk et al. 2002, Hill et al. 2016). This leads to external and internal executive compensation discrepancies between executives. The first refers to executive compensation divergences across firms in the industry, whereas the second concerns compensation disparities between executives within the same firm.

External compensation characteristics have been documented in the literature under the form of excessive compensation. CEO excess compensation is defined as the residual from the regression of total CEO compensation against a series of economic determinants and industry fixed effects (Core et al. 2008). More specifically, several papers have examined the impact of CEO excess compensation on firm performance (Core et al. 1999). Carter et al. (2016) find that excess CEO compensation predicts worse future accounting performance using ROA. Brick et al. (2006) and Balafas and Florackis (2014) show that firms that over-pay their CEOs

encounter lower future shareholder returns. In the M&A context, Malmendier and Tate (2009) show that over-compensated CEOs underperform relative to their own firms' prior accounting and stock market performance. Similarly, Ruiz and Renneboog (2017) find that firms managed by over-compensated CEOs experience negative reactions from the market when announcing corporate decisions such as takeovers.

Internal differences in pay between executives of the same firm have also been documented in the literature. Higher relative CEO pay in a company is indicative of more power and status of the manager (Finkelstein, 1992; Finkelstein & Hambrick, 1996) and enables CEOs to significantly influence the firm's compensation structure (Hambrick and Cannella, 1993). Henderson and Fredrickson (2001) examine the theories that predict the size of CEO pay gap (Economic vs behavioral). They define CEO pay gap as difference in pay between a firm's chief executive and the average pay of its four other TMT members. Park (2017) finds that larger CEO pay gap leads to more real activities manipulation (RAM) and that this relationship is driven by short-term compensation. Lee et al. (2019) find that higher internal pay gap between the CEO and the rest of the top management team (TMT) drives underpaid CEOs to pay higher acquisition premiums. Bebchuk et al. (2011) use CEO pay slice (CPS) as a new measure referring to the relationship between the CEO and executives. They define CPS as "the fraction of the aggregate compensation of the firm's top five executive team captured by the CEO". The authors find a negative association between CPS and firm value proxied as Tobin's  $q$ , accounting profitability and negative market reactions to acquisition announcements. They also show that firms managed by CEOs with higher CPS tend to offer more opportunistically timed option grants and have higher CEO turnover rates. Our final measure used by several studies (Siegel and Hambrick 2005; Fredrickson et al. 2010, Chin 2017; Steinbach 2017 and Lim 2019) to assess compensation dispersion is the TMT pay disparity defined as the coefficient of variation in the total compensation of the TMT team. Siegel and Hambrick (2005) document harmful effects of TMT pay disparity on the performance of high-technology firms.

#### *3.2.4 Hypothesis development*

The SEC's objective is to provide investors with clearer and transparent information regarding compensation disclosures. However, there are several reasons why the SEC might find external and internal discrepancies in compensation problematic.

First, the literature shows that excessive executive compensation can lead to worse firm performance (Carter et al. 2016, Ruiz and Renneboog 2017). This relationship between top management's pay and corporate performance has always been a key interest for the SEC

throughout the years. The SEC even proposed a rule in 2015, requiring companies to disclose how well executive compensation followed with corporate performance over several years. However, the rule only got adopted in August 2022 due to the opposition of two republican commissioners in 2015<sup>52</sup>. This new rule relates to a provision mentioned in the 2010 Dodd-Frank Act, to discourage financial fraud and to better align managerial compensation and corporate results.

Second, internal compensation differences can also have a substantial impact on firm performance. While tournament theory suggests that competition between executives provides performance incentives and leads to better firm performance (Kale et al. 2009), other researchers perceive it as an unhealthy competition among contenders (Dye 1984). Deprivation theory suggest that large compensation disparities between executives are seen as unjust and lead to adverse reactions such as “withholding vital information from peers, attempting to damage the reputation of rivals [...] and polishing one’s own reputation rather than paying attention to substantive operating issues” (Henderson and Fredrickson 2001). Cowherd and Levine (1992) document a negative association between differences in pay between executives and the firm’s product quality. Wade et al. (2006) show that under-paid managers relatively to others leave their firms which leads to subsequent lower firm performance.

Third, high relative CEO compensation in a firm can be seen as more power and status of the CEO (Finkelstein and Hambrick, 1996). Managerial power theory suggests that over-compensated managers have significant influence over the board of directors and on the company’s compensation structure (Pollock, Fischer and Wade 2002; Bebchuk et al. 2002, Graffin et al. 2008). The new rules adopted by the SEC in 2006 require companies to disclose compensation-related information such as the role played by executives in the compensation process, the justification of allocation of each element of compensation, what specific items of corporate performance are considered, and what are the benchmark used. These requirements suggest that the SEC pays close attention to external and internal compensation divergences.

*Hypothesis 1: Excessive external and internal executive compensation disparities are positively associated with the probability of receiving a CCL from the SEC.*

Higher external and internal executive compensation divergences can be perceived by the SEC as CEO power. Upon the receipt of a CCL, powerful CEOs may choose to omit certain

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<sup>52</sup> “SEC Requires Disclosures on Executive Pay Versus Company Performance” , 2022, *The Wall Street Journal*.  
<https://www.wsj.com/articles/sec-requires-disclosures-on-executive-pay-versus-company-performance-11661466954>

required information or disclose it in a way that is difficult for investors to understand (Laksmana et al. 2012, Bozanic et al. 2017). This leads to multiple rounds of correspondence including additional letters and supplementary compensation-related comments. Given that the new rules require firms to disclose total compensation of all executives, we expect the SEC's comments to concern the compensation package as a whole, as opposed to individual components.

*Hypothesis 2: Excessive external and internal executive compensation disparities are positively associated with the number of letters and compensation-related comments issued from the SEC.*

*Hypothesis 3: SEC comments received concern the compensation package as a whole, as opposed to individual components.*

After the resolution of all comments sent by the SEC, firms can either adapt their policies to SEC standards or maintain the same practices as before. Companies that do not comply with SEC regulations and that do not change criticized practices, can face costly consequences detrimental to their best interests such as negative reactions from the stock market (Dechow et al. 2016) and harsh penalties by the SEC<sup>53</sup>. Furthermore, companies must adopt strategic decisions to regain the trust of investors, auditors, media, regulators and other stakeholders. One of the possibilities is to fire the CEO in order to improve the company's reputation and show the board's monitoring ability (Cheng et al. 2014). Moreover, the market usually reacts positively to forced CEO turnover announcements (Huson et al. 2004). Another possibility would be to sanction the CEO financially by reducing his/her compensation as an attempt to regain investors' trust.

Papers examining the consequences of comment letters are divided on the subject. Core et al. (2008) find no evidence that companies reduce excess CEO compensation or increase CEO turnover as a response to negative press coverage. In a similar way, Robinson et al. (2011) find no evidence that firms reduce subsequent excess compensation after the end of the SEC process. However, Wang et al. (2022) find a significant negative reduction in excess CEO compensation in the two-year window surrounding the release of CCLs. Gietzmann et al.

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<sup>53</sup> In 2021, the SEC Enforcement Division handed out \$3.9 billion in penalties to companies and individuals found guilty of SEC violations (Gordon Law Ltd 2022), <https://gordonlawltd.com/sec-enforcement/>

(2016) and Cheng et al. (2014) find an increase in CFO turnover and CEO turnover respectively, after the receipt of a comment letter.

*Hypothesis 4: Changes in external and internal compensation disparities surrounding the receipt of a CCL are negatively associated with the number of compensation-related comments identified in the letter.*

*Hypothesis 5: Firms receiving a CCL are more likely to terminate powerful CEOs.*

### **3.3 Sample, variables of interest and research design**

#### *3.3.1 Sample*

Our sample is composed of COMPUSTAT firms that received or did not receive an SEC comment letter between 2004 and 2020. We use the Audit Analytics (AA) database as our starting point to obtain information related to comment letters for the period 2004-2020. The sample period begins in 2004 because the SEC began releasing comment letters (CL) issued on filings made after 2005 and we require data for one previous year. However, the initial information provided by the AA dataset is incomplete for three reasons. First, AA overlooks some of the information related to SEC regulations and accounting standards contained in comment letters. Second, the issue phrases provided by AA lack accuracy in some cases. In other words, issue phrases included in the database do not provide sufficient detail. Third, in some cases, information is missing because the SEC does not provide full references to rules. We solve these problems by creating two Python programs. The first one extracts all the rules contained in SEC comment letters and overlooked by AA. The second one extracts key words related to rules for which references are lacking. These two programs enable us to create a unique dataset composed of the complete set of issue phrases related to SEC regulations and accounting standards. We follow Heese et al. (2017) and exclude foreign firms as they are less likely to receive a comment letter. We obtain data on executive compensation, directors and governance characteristics from Execucomp, Directors and Governance (Former Riskmetrics). The final sample consists of 21 820 firm/year observations representing 2 421 firms for Model (1) as shown in Table 2. Our sample is composed of 13 374 firm-years (62%) without a comment letter, and 8 446 firm-years with a comment letter of any kind (38%) consistent with Heese et al. (2017)<sup>54</sup>. Moreover, 19 116 firm-years (88%) do not receive a compensation related

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<sup>54</sup> The authors find that 33% (67%) of the firm-years in their sample are (not) associated with a comment letter.



comment letter, whereas 2 709 firm-years (12%) are associated with a compensation comment letter consistent with Wang et al. (2022)<sup>55</sup>.

[Insert table 2 about here]

Table 3 shows that on average, about 38% of the firms in our sample receive a comment letter of any kind, consistent with Heese et al. (2017)<sup>56</sup>. Moreover, about 12% of the firms in our sample receive a comment letter related to executive compensation, consistent with Wang et al. (2022)<sup>57</sup>. The average number of compensation issue phrase is 453, with a peak reached between 2009 and 2010, consistent with the literature (Ryans 2021). The time to resolution of a conversation thread took on average 71 days, which is consistent with Heese et al. (2017) who find 67 days.

[Insert table 3 about here]

### 3.3.2 Variables of interest:

#### 3.3.2.1 Internal compensation characteristics

We compute the three main variables widely used in the executive compensation literature, corresponding to internal disparities in pay between executives of the same firm.

CEO pay gap is defined as difference in pay between a firm's chief executive and the average pay of its four other TMT members (Henderson and Fredrickson 2001). The second variable computed is CEO pay slice that captures the proportion of the top-five TMT members' compensation captured by the CEO (Bebchuk et al. 2011). Our final internal variable concerns TMT pay disparity which is defined as the standard deviation of total pay of TMT members divided by the average of their total pay (Fredrickson et al., 2010; Siegel and Hambrick, 2005; Lim 2019).

#### 3.3.2 External compensation characteristics

We compute excess CEO compensation following the method developed by Core et al. (2008) which define excess pay as the difference between CEO total compensation and CEO expected compensation. In order to compute the latter, we regress CEO total compensation against a series of economic determinants as shown in Equation (1):

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55 The authors find that 9% (91%) of the firm-years in their sample are (not) associated with a Compensation comment letter.

56 The authors find that about 34% of the firms in their sample receive a comment letter, suggesting that the SEC has reached its objective of reviewing 33% of firms each year.

57 The authors find that about 9% of the firms in their sample receive a compensation-related comment letter during the period 2006-2017.

$$\begin{aligned} \text{Log Total compensation}_{i,t} = & \beta_0 + \beta_1 \text{Log CEO tenure}_{i,t} + \beta_2 \text{S\&P 500}_{i,t} + \beta_3 \text{Log Sales}_{i,t-1} + \beta_4 \text{BM}_{i,t-1} + \beta_5 \text{Return}_{i,t} \\ & + \beta_6 \text{Return}_{i,t-1} + \beta_7 \text{ROA}_{i,t} + \beta_8 \text{ROA}_{i,t-1} + \beta_9 \text{Industry Fixed Effects}_{i,t} + \mu_{i,t} \end{aligned} \quad (1)$$

Where log total compensation is the natural logarithm of total compensation paid to the CEO of firm *i* in year *t*. Log CEO tenure (*t*) is the natural logarithm of the number of years the CEO has served at a given firm in year *t*. S&P 500 (*t*) is an indicator variable which equals to 1 if a given firm is a member of the S&P 500 in year *t*. Log Sales (*t-1*) is the logarithm of a firm's sales revenue in year *t-1*. BM(*t-1*) is the book to market ratio in year *t-1*. RET(*t*) and RET(*t-1*) are the yearly buy and hold return in year *t* and year *t-1* respectively, for a given firm. ROA(*t*) and ROA(*t-1*) are the return on assets for year *t* and year *t-1*. Industry is defined at the two-digit SIC code level. The predicted value from Equation (1) is the expected CEO compensation for a given firm in year (*t*). The residual term represents the proportion of CEO excess compensation to total compensation. The regression's results are consistent with Robinson et al. (2013) and Wang et al. (2022) (Appendix D1). The variables' definitions are provided in Appendix A.

We complement this excess CEO compensation variables with other “excess variables” computed in a similar way. Precisely, we compute excess CEO pay gap, excess CEO pay slice and excess TMT pay disparity by replacing log total compensation with log CEO pay gap, CEO pay slice and TMT pay disparity, respectively in equation (1). We then predict the expected values and generate the “excess variables” corresponding to the residuals.

### 3.3.2.3 Classification of issue phrases in CCLs

Classification of compensation issue phrases can give us a clearer and better understanding of what triggers the SEC in firm disclosure reports. Two types of issue phrases are sent by the SEC to firms: accounting standards and SEC regulations. We construct several categories by referring to the academic literature, legal and accounting reports by international firms and SEC press releases. Regarding the executive compensation literature, Murphy (2013) documents the evolution and the trends of executive compensation throughout time in both U.S and international firms. The paper points at the lack of studies on government intervention despite being both a response and a driver of time trends in CEO pay. Importantly, the study examines the structure of CEO pay packages and distinguishes between five different components of executive compensation: base salary and discretionary bonus, non-equity

incentives, stock options, stock awards and finally other compensation including perquisites, signing bonuses, termination payments, deferred compensation and pension benefits. Edmans et al. (2017) investigate the theoretical and empirical literature on executive compensation. The paper examines the main components of executive pay and the evolution of their importance in compensation packages throughout history. The authors mention six components: salaries and current bonuses, payouts from long-term incentive plans (including restricted stocks), Option grants, perks, pensions and severance pay. Using these two papers, we construct six categories related to compensation components: whole compensation package, stock awards and stock options, deferred compensation, tax, pension benefits and termination.

Next, we examine the classification designed by other comment letter related papers in the literature. Robinson et al. (2011) and Wang et al. (2022) examine the relationship between CEO excess compensation and issue phrases sent to firms related to SEC regulations. These papers classify compensation issue phrases into three categories: pay-related relevant to the content of compensation contracts, governance-related and readability related. Other non-compensation related papers suggest other classifications. Palmrose and Scholz (2004), Cassel et al. (2013) and Heese et al. (2017) categorize issue phrases in four different groups: core earnings (revenues and operating expenses), non-core earnings (impairments and restructurings), classification issues (balance sheet and cash flow) and fair value issues. Moreover, Johnston and Petacchi (2015) classify issue phrases into four categories: accounting issues, accounting/financial reporting/disclosure topics, business issues and tone and level of disclosure. We also take into account SEC press releases as of 2005 containing the detailed information regarding new compensation disclosure rules. According to the SEC, firms are required to provide specific information related to each named executive officer in formatted tables supplemented by narrative descriptions and explanations made in plain English principles. The narratives mainly concern the justification of compensation policies and practices by the firm. This allows us to construct categories related to the informational functions of issue phrases: content, format and standardization, justification of compensation policies and practices and methodology adopted.

Finally, we search for legal and accounting reports by international firms in order to have the complete picture. Precisely, we examine “The executive compensation handbook (2020)” from Gibson, Dunn and Crutcher LLP (2020) and other legal reports (Kirkland & Ellis LLP 2006; Morgan Lewis 2006; Willkie Farr & Gallagher LLP 2006; Latham & Watkins 2007). We also find accounting reports such as Deloitte (2021) and Ernst Young (2021) that examine the trends, priorities and different accounting and disclosure topics. This complementary

information enables us to construct categories related to the tables required by the SEC: summary compensation tables, stock options, share-based payments, option exercises and stock-vested table, grants of plan-based awards, outstanding equity awards and golden parachute.

### 3.3.3: Research design:

#### 3.3.3.1: Determinants of receipt of a compensation comment letter:

We first examine the probability of receiving a compensation related comment letter. We use Model (1) composed of firms that received and did not receive a comment letter from the SEC. The regression model is the following:

$$\begin{aligned}
 \text{Comment letter}_{i,t} = & \beta_0 + \beta_1 \text{external comp characteristics}_{1,t-1} + \beta_2 \text{indep directors}_{1,t-1} + \\
 & \beta_3 \text{CEO Comp committee}_{1,t-1} + \beta_4 \text{CEO tenure}_{1,t-1} + \beta_5 \text{CEO/Chairman}_{1,t-1} + \beta_6 \text{IC Weak}_{1,t-1} + \beta_7 \text{Restatement}_{1,t-1} + \\
 & \beta_8 \text{High volatility}_{1,t-1} + \beta_9 \text{Log market cap}_{1,t-1} + \beta_{10} \text{MTB}_{1,t-1} + \beta_{11} \text{Firm age}_{1,t-1} + \beta_{12} \text{Loss}_{1,t-1} + \beta_{13} \text{Low MTB}_{1,t-1} + \\
 & \beta_{14} \text{Z score}_{1,t-1} + \beta_{15} \text{Sales Growth}_{1,t-1} + \beta_{16} \text{M\&A}_{1,t-1} + \beta_{17} \text{Restructuring}_{1,t-1} + \beta_{18} \text{External Financing}_{1,t-1} + \\
 & \beta_{19} \text{Segments}_{1,t-1} + \beta_{20} \text{Firm Fixed effects}_{1,t-1} + \beta_{21} \text{Year Fixed effects}_{1,t-1} + \varepsilon_{1,t-1} \quad (2.1)
 \end{aligned}$$

$$\begin{aligned}
 \text{Comment letter}_{i,t} = & \beta_0 + \beta_1 \text{internal comp characteristics}_{1,t-1} + \beta_2 \text{indep directors}_{1,t-1} + \\
 & \beta_3 \text{CEO Comp committee}_{1,t-1} + \beta_4 \text{CEO tenure}_{1,t-1} + \beta_5 \text{CEO/Chairman}_{1,t-1} + \beta_6 \text{IC Weak}_{1,t-1} + \beta_7 \text{Restatement}_{1,t-1} + \\
 & \beta_8 \text{High volatility}_{1,t-1} + \beta_9 \text{Log market cap}_{1,t-1} + \beta_{10} \text{MTB}_{1,t-1} + \beta_{11} \text{Firm age}_{1,t-1} + \beta_{12} \text{Loss}_{1,t-1} + \beta_{13} \text{Low MTB}_{1,t-1} + \\
 & \beta_{14} \text{Z score}_{1,t-1} + \beta_{15} \text{Sales Growth}_{1,t-1} + \beta_{16} \text{M\&A}_{1,t-1} + \beta_{17} \text{Restructuring}_{1,t-1} + \beta_{18} \text{External Financing}_{1,t-1} + \\
 & \beta_{19} \text{Segments}_{1,t-1} + \beta_{20} \text{Industry Fixed effects}_{1,t-1} + \beta_{21} \text{Year Fixed effects}_{1,t-1} + \varepsilon_{1,t-1} \quad (2.2)
 \end{aligned}$$

Where *Comment letter*<sub>*i,t*</sub> is a dummy variable equal to 1 if the firm *i* received a compensation related comment letter for the fiscal year ended *t*, and 0 otherwise.  $\beta_0$  is the constant. We estimate Model 1 using logistic regression estimates following Cassel et al. (2013) and Heese et al. (2017)<sup>58</sup>.

We also use proxies for governance characteristics following Cassel et al. (2013) and Heese et al. (2017). We include an indicator equal to 1 if the CEO is the chairman of the board of directors (CEO/Chairman), and 0 otherwise. Furthermore, we include a variable representing the proportion of independent board members and CEO tenure. We also use a dummy variable equal to 1 if the CEO is a member of the compensation committee and 0 otherwise. Since

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58 We also use linear probability models as a robustness check given that these models may reduce bias when estimating nonlinear models with fixed effects (Wooldridge 2002).

governance data is only available for a subset of our sample, we include a separate indicator variable (Gov Missing) equal to 1 if the governance data is missing, and 0 otherwise (Cassel et al. 2013, Heese et al. 2017).

The control variables in the regressions are motivated by Cassel et al. (2013), Heese et al. (2017) and Duro et al. (2019) who examine the factors affecting the probability of receiving a comment letter. The authors justify the use of these control variables by referring to SOX Section 408, paragraph (b). This section states that the SEC considers several factors before addressing a comment letter. The SEC targets “(1) issuers that have issued material restatements of financial results; (2) issuers that experience significant volatility in their stock price as compared to other issuers; (3) issuers with the largest market capitalization; (4) emerging companies with disparities in price-to-earnings ratios; (5) issuers whose operations significantly affect any material sector of the economy; and (6) any other factors that the Commission may consider relevant.” The last point mentioned includes executive compensation characteristics overlooked by previous papers.

The two control variables related to factor (1) are proxies for internal control quality (IC\_Weak) and previous failures in financial reporting (Restate). Regarding factor (2) related to high volatility, we construct a dummy variable equal to 1 if the volatility of abnormal monthly stock returns (equal to the monthly return [RET] minus the value weighted return [VWRTD]) is in the highest quartile in a given fiscal year, and 0 otherwise. We proxy for factor (3) (firm size) by including the logarithm of market capitalization. Factor (4) is represented by the Market Book ratio (MTB) to capture firms’ growth expectations. With respect to factor (5), Cassel et al. (2013) and Heese et al. (2017) include industry fixed effects in their regressions. Concerning the last factor (6), we include executive compensation characteristics as we expect them to affect SEC scrutiny.

Prior research documents that larger, more mature and more profitable companies are associated with higher financial reporting quality. Thus, we include company age and Loss (profitability) in addition to the logarithm of market capitalization. We expect larger companies to receive more SEC scrutiny. Regarding firm profitability, we predict a positive relationship between Loss and the likelihood of receiving a comment letter as less profitable companies receive more SEC scrutiny. We also include the Altman Z-score (Altman, 1968) in order to proxy for financial distress. We follow Cassel et al. (2013) and Heese et al. (2017) by including proxies for company complexity: Sales growth, the number of segments, an indicator for merger and acquisition activity (M&A) and an indicator for restructuring charges. We follow

Ettredge et al. (2011) and proxy for management's plans to issue new equity and debt securities (Ext Financing).

Finally, we incorporate in all our regressions containing external compensation characteristics firm and year fixed effects with robust standard errors at the firm-level given that we account for industry fixed effects in the computation of these variables. Regarding internal compensation characteristics, we use industry and year fixed effects with robust standard errors at the firm-level. Appendix A presents our variable definitions.

### 3.3.3.2: Executive compensation and comment-letter review characteristics:

To shed more light on the nature of compensation related comment letters, we examine the impact of executive compensation variables on comment letter characteristics. We use the following regression model where the letter  $i$  represents the firm and  $t$  the year (Model 2):

$$\begin{aligned} \text{Comment letter characteristics}_{i,t} = & \beta_0 + \beta_1 \text{external comp characteristics}_{1,t-1} + \beta_2 \text{indep directors}_{1,t-1} + \\ & \beta_3 \text{CEO Comp committee}_{1,t-1} + \beta_4 \text{CEO tenure}_{1,t-1} + \beta_5 \text{CEO/Chairman}_{1,t-1} + \beta_6 \text{IC Weak}_{1,t-1} + \beta_7 \text{Restatement}_{1,t-1} + \\ & \beta_8 \text{High volatility}_{1,t-1} + \beta_9 \text{Log market cap}_{1,t-1} + \beta_{10} \text{MTB}_{1,t-1} + \beta_{11} \text{Firm age}_{1,t-1} + \beta_{12} \text{Loss}_{1,t-1} + \beta_{13} \text{Low MTB}_{1,t-1} + \\ & \beta_{14} \text{Z score}_{1,t-1} + \beta_{15} \text{Sales Growth}_{1,t-1} + \beta_{16} \text{M\&A}_{1,t-1} + \beta_{17} \text{Restructuring}_{1,t-1} + \beta_{18} \text{External Financing}_{1,t-1} + \\ & \beta_{19} \text{Segments}_{1,t-1} + \beta_{20} \text{Firm Fixed effects}_{1,t-1} + \beta_{21} \text{Year Fixed effects}_{1,t-1} + \varepsilon_{1,t-1} \end{aligned} \quad (3.1)$$

$$\begin{aligned} \text{Comment letter characteristics}_{i,t} = & \beta_0 + \beta_1 \text{internal comp characteristics}_{1,t-1} + \beta_2 \text{indep directors}_{1,t-1} + \\ & \beta_3 \text{CEO Comp committee}_{1,t-1} + \beta_4 \text{CEO tenure}_{1,t-1} + \beta_5 \text{CEO/Chairman}_{1,t-1} + \beta_6 \text{IC Weak}_{1,t-1} + \beta_7 \text{Restatement}_{1,t-1} + \\ & \beta_8 \text{High volatility}_{1,t-1} + \beta_9 \text{Log market cap}_{1,t-1} + \beta_{10} \text{MTB}_{1,t-1} + \beta_{11} \text{Firm age}_{1,t-1} + \beta_{12} \text{Loss}_{1,t-1} + \beta_{13} \text{Low MTB}_{1,t-1} + \\ & \beta_{14} \text{Z score}_{1,t-1} + \beta_{15} \text{Sales Growth}_{1,t-1} + \beta_{16} \text{M\&A}_{1,t-1} + \beta_{17} \text{Restructuring}_{1,t-1} + \beta_{18} \text{External Financing}_{1,t-1} + \\ & \beta_{19} \text{Segments}_{1,t-1} + \beta_{20} \text{Industry Fixed effects}_{1,t-1} + \beta_{21} \text{Year Fixed effects}_{1,t-1} + \varepsilon_{1,t-1} \end{aligned} \quad (3.2)$$

Where *Comment letter characteristics* <sub>$i,t$</sub>  refer to several comment letter features: the number of letters received, the logarithm of the number of compensation issue phrases, the number of issue phrases related to the different categories created, the time to resolution of a conversation thread and the persistence of compensation issue phrases. We examine exclusively firms that received a compensation comment letter. Our sample contains the complete set of compensation issue phrases related to SEC Regulations and accounting standards.

### 3.3.3.3: Do compensation-related comment letters matter?

The last section in our analysis focuses on the impact of comment letters on CEO compensation characteristics. Precisely, we measure the impact of receiving a compensation-related comment letter on the change in compensation characteristics<sup>59</sup>. We follow Wang et al. (2022) and use the following regression model:

$$\Delta \text{CEO external comp characteristics}_{i,t:t+1} = \beta_0 + \beta_1 \text{Comp CL}_{1,t} + \beta_2 \text{external comp characteristics}_{1,t} + \beta_3 \text{indep directors}_{1,t} + \beta_4 \text{CEO Comp committee}_{1,t} + \beta_5 \text{CEO tenure}_{1,t} + \beta_6 \text{CEO/Chairman}_{1,t} + \beta_7 \text{IC Weak}_{1,t} + \beta_8 \text{Restatement}_{1,t} + \beta_9 \text{High volatility}_{1,t} + \beta_{10} \text{Log market cap}_{1,t} + \beta_{11} \text{MTB}_{1,t} + \beta_{12} \text{Firm age}_{1,t} + \beta_{13} \text{Loss}_{1,t} + \beta_{14} \text{Low MTB}_{1,t} + \beta_{15} \text{Z score}_{1,t} + \beta_{16} \text{Sales Growth}_{1,t} + \beta_{17} \text{M\&A}_{1,t} + \beta_{18} \text{Restructuring}_{1,t} + \beta_{19} \text{External Financing}_{1,t} + \beta_{20} \text{Segments}_{1,t} + \beta_{21} \text{Firm Fixed effects}_{1,t} + \beta_{22} \text{Year Fixed effects}_{1,t} + \varepsilon_{1,t} \quad (4.1)$$

$$\Delta \text{CEO internal comp characteristics}_{i,t:t+1} = \beta_0 + \beta_1 \text{Comp CL}_{1,t} + \beta_2 \text{internal comp characteristics}_{1,t} + \beta_3 \text{indep directors}_{1,t} + \beta_4 \text{CEO Comp committee}_{1,t} + \beta_5 \text{CEO tenure}_{1,t} + \beta_6 \text{CEO/Chairman}_{1,t} + \beta_7 \text{IC Weak}_{1,t} + \beta_8 \text{Restatement}_{1,t} + \beta_9 \text{High volatility}_{1,t} + \beta_{10} \text{Log market cap}_{1,t} + \beta_{11} \text{MTB}_{1,t} + \beta_{12} \text{Firm age}_{1,t} + \beta_{13} \text{Loss}_{1,t} + \beta_{14} \text{Low MTB}_{1,t} + \beta_{15} \text{Z score}_{1,t} + \beta_{16} \text{Sales Growth}_{1,t} + \beta_{17} \text{M\&A}_{1,t} + \beta_{18} \text{Restructuring}_{1,t} + \beta_{19} \text{External Financing}_{1,t} + \beta_{20} \text{Segments}_{1,t} + \beta_{21} \text{Industry Fixed effects}_{1,t} + \beta_{22} \text{Year Fixed effects}_{1,t} + \varepsilon_{1,t} \quad (4.2)$$

Where  $\Delta$  CEO external (internal) compensation characteristics  $t:t+1$  is the change in CEO external (internal) compensation characteristics from year  $t$  to year  $t+1$ . Comp. CL takes a value of 1 if a firm received a compensation-related comment letter in a given year, 0 otherwise. We also account for the number of issue phrases related to executive compensation and the number of issue phrases related to SEC regulations and accounting standards.

We expect to find a negative association between the change in internal and external compensation characteristics and the receipt of a comment letter following the literature (Wang et al. 2022, Laksmana et al. 2012, Bozanic et al. 2017). Firms that do not comply with SEC regulations and that do not change criticized practices, can face costly consequences detrimental to their best interests such as negative reactions from the stock market (Dechow et al. 2016) and harsh penalties by the SEC.

Moreover, we conduct analyses to measure the impact of receiving a compensation-related comment letter on CEO turnover. More specifically, we follow Gietzmann et al. (2016) by using a proportional hazard model. We use the following regression model:

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<sup>59</sup> We perform the same analysis using CEO pay gap and CEO pay slice as a robustness check.

$$CEO\ turnover_{i,t} = \beta_0 + \beta_1 Comp\ CL_{1,t-1} + \beta_2 comp\ characteristics_{1,t-1} + \beta_3 CEO/Chairman_{1,t-1} + \beta_4 Loss_{1,t-1} + \beta_5 ROA_{1,t-1} + \beta_6 Firm\ size_{1,t-1} + \beta_7 Leverage_{1,t-1} + \beta_8 Firm\ age_{1,t-1} + \beta_9 IC\ Weak_{1,t} + \beta_{10} Restatement_{1,t} + \beta_{11} M\&A_{1,t-1} + \beta_{12} Sales\ Growth_{1,t-1} + \beta_{13} Z\ score_{1,t-1} + \beta_{14} Annual\ return_{1,t-1} + \beta_{15} Segments_{1,t-1} + \varepsilon_{1,t-1} \quad (5)$$

Where  $Comp\ CL_{i,t-1} = 1$  if the firm received a compensation-related comment letter from the SEC in year  $t-1$ , 0 otherwise.

Following Gietzmann et al. (2016), we use the same covariates to control for other determinants of CEO turnover. In particular, the authors control for financial distress (Loss), bankruptcy or liquidation (BANKR), performance (ROA & Sales Growth), stock performance (Annual Return), firm size (size), firm age, complexity (number of segments, M&As), Leverage, internal weaknesses (IC\_Weak), restatements (Rest) and CEO/Chairman duality. We expect to find a higher probability of CEO turnover for firms targeted by the SEC. After the receipt of a comment letter, companies must adopt strategic decisions to regain the trust of investors, auditors, media, regulators and other stakeholders. One of the possibilities is to fire the CEO in order to improve the company's reputation and show the board's monitoring ability (Cheng et al. 2014). Moreover, the market usually reacts positively to forced CEO turnover announcements (Huson et al. 2004).

### **3.4. Compensation characteristics and the likelihood of receiving a comment letter**

#### *3.4.1 Univariate results*

Table 4 reports the descriptive statistics for the variables we have in our analyses. Panel A presents the statistics for the complete sample. Panel B compares means between CL and non-CL firms (firms that received a general comment letter vs firms that did not), while Panel C compares means between CCL firms and non-CL firms (firms that received a compensation-related comment letters vs firms that did not received a comment letter). Finally, Panel D compares means between CCL firms and other CL firms (firms that received a compensation-related comment letters vs firms that received a comment letter on a topic not related to compensation)

[Insert table 4 about here]

Panel A shows that in the full sample, 38% (12%) of firm-years are concerned by comment letters (Compensation-related comment letters). Panel B shows that the SEC seems to target firms that are larger, more complex (M&A, Segments, restructuring), less profitable (higher Loss), with more leverage, lower accounting performance (ROA), lower market performance (annual return). Concerning compensation variables, we notice that the total compensation of



CEOs managing firms that received a general comment letter is higher (8.344 vs 8.154) and more excessive (0.129 vs 0.046). These managers are more dominant within their own firms as captured by the log CEO pay gap (7.754 vs 7.550) and TMT pay disparity (0.639 vs 0.626). Regarding governance structure, companies targeted by the SEC have more independent directors, and more powerful CEOs (higher chairman duality), consistent with Heese et al. (2017).

Similarly, panel C shows that CEOs of firms receiving a CCL receive larger compensation packages, (8.242 vs 8.154), receive more excessive compensation (0.123 vs 0.046) and are more dominant within their companies as captured by CEO pay gap (7.645 vs 7.551) and TMT pay disparity (0.640 vs 0.626). We also note that firms receiving a CCL have more independent directors and their CEOs is also the chairman of the board in 60% of the cases (vs 53% for firms that did not receive a CL).

Finally, Panel D shows that CEOs leading CCL firms receive more excessive compensation than those managing firms that received a CL on another topic as captured by excess CEO pay slice (0.192 vs 0.0129) and excess TMT pay disparity (0.031 vs 0.016). Results regarding internal compensation characteristics are not sufficiently conclusive. We also find that firms receiving CCLs have fewer independent directors and are more likely to have CEOs who are also the chairman of the board. We also construct correlations matrices including external and internal compensation characteristics (Table 5). We find a positive association between external and internal compensation variables and the receipt of a compensation-related comment letter.

[Insert table 5 about here]

### *3.4.2 Multivariate results*

Table 6 shows the results of estimating equations (2.1) and (2.2) on our main sample (21 820 observations). The dependent variable takes the value of 1 if a firm received a compensation-related comment letter in a given year and 0 otherwise. We conduct a logistic regression following Cassel et al. (2013) and Heese et al. (2017). We find a significant and positive association between the probability of receiving a compensation comment letter and all the variables related to external and internal compensation characteristics. We do not include all the variables in the same regression as they are highly correlated. These results suggest two things. First, firms managed by overcompensated CEOs relative to their industry peers have a higher likelihood of being on the SEC's radars. This is consistent with the SEC's growing interest over the years regarding the relationship between executive compensation and corporate performance. This is also consistent with the literature linking excess compensation

to poor firm performance (Carter et al. 2016). Second, important divergences in executive compensation within the same firm catches the SEC's attention and leads to more regulatory scrutiny. In other words, internal compensation characteristics can be perceived for the SEC as a signal for dominant and powerful CEOs and lead to additional comment letters. Our results are consistent with Cheng et al. (2014) who find that the SEC targets companies with strong CEOs.

[Insert table 6 about here]

Regarding governance variables, we do not find any significant result consistent with Cassel et al. (2013). The other significant coefficients, internal control weaknesses and restatements are consistent with prior research (Cassel et al. 2013, Heese et al. 2017). As a robustness check, we run the regression on a reduced sample containing firms that received a CCL and firms that did not receive any comment letter. The results are reported in Appendix D2 and lead to the same conclusions. We also test our hypothesis using a linear probability regression model given that this model may reduce bias when estimating nonlinear models with fixed effects (Wooldridge 2002). We find similar results as in the previous regressions.

We also investigate whether the propensity of receiving a CCL is driven by CEOs' equity-based incentives rather than the external and internal differences in compensation among executives. The reason for this is that firms are required by the SEC to provide information relative to the basis for allocating equity-based compensation. We follow Coles et al. (2006) and estimate vega and delta that constitute more precise CEO measure of incentives compared to the potentially noisy proxies such as the number or values of options and stock held or granted (Crocì and Petmezas 2015). Vega is defined as the change in the dollar value of the CEO wealth for a 1% change in the annualized standard deviation of stock returns, whereas delta represents the change in CEO wealth for a 1% change in stock price. Following Edmans et al. (2009), we scale our incentive measures by total annual compensation (Execucomp variable TDC1) in order to have incentives that are independent of firm size.<sup>60</sup> We also generate excess delta and excess vega by following the same methodology employed by Core et al. for the estimation of excess CEO compensation (2008). The results are presented in appendix D3 and show no significant association between delta and vega, and the likelihood of receiving a CCL. This finding confirms our results and suggest that the SEC is potentially targeting firms managed by CEOs with high external and internal compensation disparities with their peers.

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<sup>60</sup> This is equivalent to multiplying Coles et al. (2013) delta measure by 100 and scaling it by total annual compensation (Execucomp variable TDC1).

### 3.4.2.1 *Comment letters' characteristics*

In this section, we examine the impact of external and internal executive compensation on comment letter characteristics. We use Model (2) defined as in Table 2, composed of firm-years with comment letters (compensation-related in our case) following Heese et al. (2017) and Cassel et al. (2013).

In Table 7, we examine the relationship between external and internal compensation characteristics and the number of compensation-related letters received by a firm in a given year. We find a strong significant association between two internal compensation characteristics (CEO pay gap and CEO pay slice) and the number of letters issued to firms by the SEC. These results indicate that higher internal discrepancies between executives within the same firm lead to more received letters from the SEC suggesting that dominant and powerful CEOs are more investigated by the SEC. These findings are consistent with the literature highlighting the role of powerful CEOs in omitting certain required information or disclosing it in a way that is difficult for investors to understand (Laksmana et al. 2012, Bozanic et al. 2017) leading to a significant number of exchanged letters with the SEC. We use OLS regressions for the regressions presented in table 7 following Cassel et al. (2013) and Heese et al. (2017). Our dependent variable is the number of CCL letters received from the SEC<sup>61</sup>. We also confirm our results by using negative binomial regressions since the number of letters is a count variable taking integer values greater or equal to 1 in a given year at variable rates over the time period of interest (appendix D4). Overall, our results indicate that higher internal executive compensation disparities induce more letters from the SEC.

[Insert table 7 about here]

Next, we analyze the link between compensation characteristics and the number of compensation issue phrases received by a firm. Following Robinson et al. (2013), we run an OLS regression where the dependent variable is the logarithm of the number of compensation-related issue phrases. The results in table 8 document a positively significant association between external and internal compensation characteristics and the number of compensation-related issue phrases. However, similarly to before, the results are more pronounced for internal compensation disparities. The results also suggest that when the CEO is also a member of the compensation committee (CEO Comp committee), his or her firm tend to receive more compensation issue phrases. This finding is in line with one of the SEC's requirements regarding the role played by executives in the compensation process (SEC 2006). We also find

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61 Our results do not change when we use the logarithm of the number of letters.

a negatively significant relationship with CEO tenure at the 5% level suggesting that more experienced CEO receive less comments from the SEC because they may have a better understanding of disclosure of complex business practices and operations and the risks associated to omitting required information (Cassel et al. 2013).

Overall, our results suggest that higher external and especially internal disparities in executive compensation leads to the receipt of a greater number of compensation issue phrases. The SEC seems to target firms where the CEO is a member of the compensation committee. Finally, firms seem to receive less issue phrases when the CEO has been in position for a significant period.

[Insert table 8 about here]

We also examine the type of issue phrases received by firms from the SEC (accounting standard or SEC regulations). Table 9 displays a positive (negative) significant association between internal and external compensation characteristics and the logarithm of the number of issue phrases related to SEC regulations (accounting standards). This result is consistent with Robinson et al. (2011) who find a significantly positive link between excess compensation and the number of SEC comments related to pay-performance and corporate governance mechanisms. Consistent with previous results, we find a positive relationship between the logarithm of issue phrases related to SEC regulations and CEO compensation committee. The findings suggest that greater internal and external compensation characteristics increase the number of issue phrases related to SEC regulations received by the firm.

[Insert table 9 about here]

Our next set of analysis concerns the categorization of issue phrases. We classify issue phrases in three big categories: compensation components, tables required by the SEC and informational functions. We begin by examining the impact of external and internal compensation characteristics on the compensation components attributed to executives (table 10<sup>62</sup>). As expected, our results document a positively significant association between internal and external compensation disparities, and the number of issue phrases related to the compensation package as a whole as opposed to individual components<sup>63</sup>. Note that our results are more pronounced for internal compensation disparities. Furthermore, we find a positively significant (at the 1% level) association between CEO pay gap and issue phrases related to pension benefits. Overall, our findings are consistent with the SEC's press releases in 2006

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62 Table 10 displays results for excess CEO pay gap and log CEO pay gap. However, the results stay the same even when we replace these variables with other variables related to external and internal compensation characteristics.

63 Our results do not change when we use the log number of issue phrases.

requiring firms to disclose the “total annual compensation for each named executive officer” (Cox 2006) in order to have a clearer and more complete picture of compensation.

[Insert table 10 about here]

We then turn our attention to the tables required by the SEC (table 11). Consistent with previous findings, our results indicate a positively significant association between external and internal compensation disparities, and issue phrases related to the summary compensation table. This table contains information concerning the total compensation of the named executive officers for the last three fiscal years. The association with other required tables by the SEC is not significant, suggesting that the SEC focuses on the compensation package as whole rather than specific components.

[Insert table 11 about here]

The final classification of issue phrases concerns informational functions. Table 12 documents the results of an OLS regression linking external and internal compensation discrepancies with issue phrases classified in informational functions categories. Our results indicate no significant association between informational function issue phrases and external compensation disparities. However, we document a significant positive link between internal pay gap and issue phrases related to the content and formatting of the tables, and the justification of compensation policies and practices. We find no significant association between compensation characteristics and issue phrases related to the methodology employed for valuation, measurement and recognition purposes. These results are consistent with our previous findings as issue phrases linked to the content, format and justification of compensation policies are mostly related to SEC regulations; whereas issue phrases associated to the methodology employed are mostly related to accounting standards (appendix B and C). The negative and significant association between CEO tenure and issue phrases related to SEC regulations persists and suggests that more experienced CEOs have a better understanding of disclosure requirements.

[Insert table 12 about here]

The next step consists of examining the relationship between external and internal compensation characteristics and the time to resolution of a conversation thread. The duration of a conversation between the SEC and a given firm is the total number of days between the first letter received by the firm and the last one. Note that in a minority of cases some firm-year observations have more than one conversation thread. In these cases, we adopt two methods. First, we take into account the total number of days of all the conversations in a given year. Second, we only consider the longest conversation in a given year. Table 13 displays the

results. We find a positive and significant association between external and internal compensation disparities and the time to resolution of a conversation thread consistent with our previous findings. These findings suggest that higher external and internal compensation divergences between executives lead to longer conversations between firms and the SEC.

[Insert table 13 about here]

We proceed by investigating the association between external and internal compensation characteristics and the persistence of compensation issue phrases. We analyze issue phrases' persistence over the period of the conversation thread (table 14). We find that internal (external) compensation characteristics are (not) significantly associated to persistent issue phrases. Specifically, the results show that higher CEO pay gap is associated with a higher number of persistent issue phrases over the period. This confirms our previous results suggesting that dominant CEOs may choose to omit certain required information or disclose it in a way that is difficult for investors to understand (Laksmana et al. 2012, Bozanic et al. 2017). This situation drives the SEC to use the same persistent issue phrases with the explanations provided. Overall, our results suggest that firms managed by CEOs with high internal compensation divergences with other executives tend to receive the same persistent issue phrases over the period. Consistent with our previous results, these firms take more time to resolve persistent issue phrases over the period.

[Insert tables 14 about here]

#### 3.4.2.2 *The consequences of receiving a compensation comment letter:*

In this section, we turn our attention to the impact of receiving a CCL on subsequent changes in compensation and executive characteristics. Precisely, we examine changes in external and internal compensation characteristics and CEO turnover after the receipt of a CCL.

Table 15 displays the results of examining the relationship between (external) internal compensation characteristics and the change in (excess CEO pay gap) CEO pay gap<sup>64</sup>. Our dependent variables are the one-year changes in excess CEO pay gap and internal CEO pay gap respectively. We follow Wang et al. (2022) and include in our regression a dummy variable equal to 1 if the firm received a CCL in the previous year, the logarithm of compensation issue phrases, the logarithm of SEC regulations issue phrases and the logarithm of accounting standards issue phrases. The results in both tables show a negatively significant relationship between CCLs and the subsequent changes in compensation disparities between executives. We also find that this negative association is driven by issue phrases related to SEC regulations,

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<sup>64</sup> In these tests, we exclude cases where there was CEO turnover at any time during the measurement interval for the change in compensation,

not accounting standards. We also find a negative significant association between independent directors and subsequent changes in compensation characteristics. This suggest that the presence of a significant number of independent directors leads to a reduction in changes in internal and external compensation disparities. These results are consistent with Wang et al. (2022) who document a negative association between the number of compensation issue phrases and subsequent changes in CEO excess compensation<sup>65</sup>. Our findings are also in line with Chen et al. (2020) who document in reduction in CEO annual bonuses after the receipt of an SEC comment letter related to revenue recognition.

[Insert table 15 about here]

We follow Wang et al. (2022) and examine the effect of CEO power on the relationship between CCLs and subsequent compensation changes. The literature shows that companies with weaker governance are less likely to comply with SEC regulations (Ettredge et al. 2011) and that over-compensated CEOs are less willing to reduce their pay (Core et al. 2008). This suggests that our result can be attenuated for powerful CEOs. Several measures have been used in the literature for CEO power. Among them, a dummy variable that takes a value of one if the CEO is the board chair (Al Shammari et al. 2009, Cheng et al. 2014). The combined CEO and board chair position gives the CEO significant authority and influence over the board. Consequently, we split our sample according to the incidence (CEO/Chairman duality=1) or the absence (CEO/Chairman duality=0) of CEO/Chairman duality and re-run our regressions on the two generated sub-samples. The results are presented in table 16. We find that the negative association between CCLs and subsequent changes in internal and external compensation characteristics persists for firms managed by less powerful CEOs (CEOs is not the chair).

[Insert table 16 about here]

In our final set of analysis, we examine the impact of a CCL on CEO turnover. Companies that do not comply with SEC regulations and that do not change criticized practices, can face costly consequences detrimental to their best interests such as negative reactions from the stock market (Dechow et al. 2016) and significant penalties by the SEC. We follow Gietzmann et al. (2016) and use a proportional hazard model because it allows for the detection of dynamic effects. We also use the same set of control variables referred to in their paper. Our results are presented in table 17. They indicate that higher external and internal compensation disparities lead to an increase in CEO turnover, consistent with Gietzmann et al. (2016) and Cheng et al.

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<sup>65</sup> However, the regressions used have an autoregressive aspect (since excess pay predict the change in excess pay) that could raise some econometric issues. Our results do not change when removing excess pay from our regression.

(2014) find an increase in CFO turnover and CEO turnover respectively, after the receipt of a comment letter. We also find that CEOs that are also the chairmen of their firms have a higher probability of being replaced.

[Insert table 17 about here]

### **3.5 Conclusion**

We examine the association between internal and external compensation characteristics and compensation-related comment letters. Our results suggest that, in addition to excess CEO compensation, internal compensation disparities between the CEO and other executives within the same firm increase the likelihood of receiving a compensation-related comment letter from the SEC. These firms with dominant CEOs tend to receive more letters from the SEC and more issue phrases related to SEC regulations. These issue phrases are related to the compensation package as a whole and to the summary compensation table in particular. Comments made by the SEC to firms with high internal compensation disparities, concern the content, format of the tables and the justification of compensation policies and practices. We also find that these firms take more time to resolve the comments made by the SEC. Our results indicate that issue phrases persist over the period, suggesting that dominant CEOs take more time to resolve comments addressed to them. Regarding the impact of comment letters related to executive compensation, we find that CCLs lead to a decrease in the subsequent changes associated with internal and external compensation disparities. In particular, we find that this association is concentrated in firms with less powerful CEOs, proxied by CEO/chairman duality. Finally, using a proportional hazard model, we find that CCLs and higher internal and external compensation characteristics are associated with an increase in CEO turnover.

This study makes several contributions. Prior studies investigating the determinants of receipt of comment letters consider SOX section 408 criteria, firm characteristics, auditor characteristics and governance characteristics. We complement this line of studies by examining the association between compensation characteristics and the propensity of receiving a compensation-related comment letter. To our knowledge, this is the first paper that highlights the role of executive compensation in the receipt of a CCL. Second, other papers linking executive compensation and comment letters (Robinson et al. 2011; Wang et al. 2022) only focus on external compensation characteristics. In our study, we also highlight the role played by internal compensation characteristics, defined as the compensation disparities between the CEO and other executives within the same firm. We also contribute to the external



compensation characteristics literature by computing additional “excess” variables such as excess CEO pay gap, excess CEO pay slice and excess TMT pay disparity. Third, prior studies examining CCLs have exclusively focused on a part of SEC regulations. Our study investigates the complete set of issue phrases sent from the SEC composed of SEC regulations and accounting standards. Fourth, our study contributes to the categorization of issue phrases as we use three types of classifications: compensation components, required tables from the SEC and informational functions. Finally, we complement the line of studies (Robinson et al. 2011, Wang et al. 2022, Chen et al. 2020) examining the impact of CCLs on subsequent compensation by underlining the effectiveness of disclosure regulations. Precisely, we show that external and internal executive compensation disparities decrease after the receipt of a comment letter.

This study has also some limitations. First, this study is based on a sample that consists of firms from the S&P 1500, we do not know if our findings can be replicated on a sample including firms with smaller market values. Second, while we have included firm and industry fixed effects as an attempt to control for omitted variable bias, we could re-estimate our tests on a propensity score matched sample. Third, while we have attempted to control for the main governance variables in the literature, other additional variables could be included. Finally, our study can be complemented by adding an event study or examining market reactions happening after the receipt of a comment letter.

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**Table 1: CLs Literature Review**

**Panel A: Determinants and Resolution of SEC comment letters**

Variables	Comment letters (CL)					Compensation comment letters (CCL)
	Cassel et al. (2013)	Heese et al. (2017)	Johnston and Petacchi (2017)	Gunny and Hermis (2020)	Cunningham et al. (2020)	Robinson et al. (2011)
<b><u>Determinants of receipt of a CL</u></b>						
SOX Section 408	✓	✓	✓	✓	✓	
Firm characteristics	✓	✓	✓	✓	✓	✓
Audit characteristics	✓	✓	✓	✓		
Governance characteristics	✓	✓				✓
Compensation characteristics						✓
<i>CEO Excess compensation</i>						✓
<i>Other External comp. characteristics</i>						
<i>Internal comp. characteristics</i>						
<b><u>Resolution of CL</u></b>						
Time to Resolution	✓	✓		✓		
Number of letters (Rounds)	✓	✓				
Number of Comments/issue phrases	✓	✓	✓		✓	✓
Topic	✓	✓	✓	✓	✓	✓

**Panel B: Consequences of SEC comment letters**

Variables	Comment letters (CL)							Compensation comment letters (CCL)				
	Cheng et al. (2014)	Dechow et al. (2016)	Gietzman et al. (2016)	Kubick et al. (2016)	Johnston and Petacchi (2017)	Bozanic et al. (2017)	Ryans (2021)	Robinson et al. (2011)	Laksmana et al. (2012)	Chen et al. (2020)	Yang (2021)	Wang et al. (2022)
<b><u>Consequences of CLs</u></b>												
Market reactions		✓			✓							
CFO turnover			✓									
CEO turnover	✓											
Change in compensation								✓		✓		✓
Change in Tax avoidance behavior				✓								
Change in informational environment					✓	✓			✓		✓	
Restatements, write downs, earnings	✓						✓					

**Table 2: Sample construction**

Sample selection	Firm/Year	Firms
Sample after merging with AA, Compustat, Execucomp and Governance	25 607	2 492
Less: Firm-years incomplete records	-3 787	72
<b>Final Sample including firms with and without CLs</b>	<b>21 820</b>	<b>2 421</b>
Less: Firm-years without a comp CL	-19 114	975
<b>Final Sample including firms with CCLs</b>	<b>2 706</b>	<b>1 443</b>



**Table 3: Comment Letter Statistics**

The table displays CL statistics over the period 2004-2020 for Model (1). All variables are winsorized at 1% and 99% levels. See Appendix A for variable definitions.

Year	Number of firms in the sample	Number of firms receiving a CL	% of total firms receiving a CL	Number of firms receiving a Comp. CL	% of total firms in the sample	Total issue phrases	Total Compensation issue phrases	% of total issue phrases	SEC Regulations	% of total comp issue phrases	Accounting standards	% of total comp issue phrases	Mean Time to resolution
2004	1 226	38	3%	12	1%	622	12	2%	7	58%	5	42%	133
2005	1 232	389	32%	74	6%	7 868	128	2%	56	44%	72	56%	134
2006	1 194	527	44%	155	13%	10 367	261	3%	81	31%	180	69%	108
2007	1 181	578	49%	341	29%	13 668	2 220	16%	2002	90%	218	10%	113
2008	1 395	657	47%	365	26%	11 987	995	8%	842	85%	153	15%	78
2009	1 401	731	52%	420	30%	15 430	1 227	8%	1 014	83%	213	17%	80
2010	1 406	800	57%	519	37%	12 840	1 222	10%	1 035	85%	187	15%	76
2011	1 419	662	47%	202	14%	9 409	461	5%	331	72%	130	28%	72
2012	1 372	723	53%	174	13%	8 709	364	4%	234	64%	130	36%	63
2013	1 339	636	47%	141	11%	7 012	280	4%	196	70%	84	30%	55
2014	1 351	523	39%	91	7%	5 194	161	3%	101	63%	60	37%	56
2015	1 302	493	38%	81	6%	4 252	139	3%	85	61%	54	39%	45
2016	1 276	516	40%	79	6%	4 320	134	3%	76	57%	58	43%	49
2017	1 253	454	36%	31	2%	3 187	52	2%	37	71%	15	29%	41
2018	1 232	367	30%	19	2%	2 211	32	1%	16	50%	16	50%	42
2019	1 201	220	18%	4	0%	1 133	6	1%	4	67%	2	33%	35
2020	1 045	135	13%	1	0%	646	1	0%	1	100%	0	0%	25
Mean	1 284	497	38%	159	12%	6 679	453	4%	360	67%	93	32%	71

**Table 4: Descriptive statistics for the sample:** the table reports the summary statistics on CEO compensation, firm and other CEO characteristics for U.S firms over the period 2004-2020. We report the mean, median, min, max and standard deviation of our variables. The variables are defined in Appendix A.

<b>Panel A: pooled sample</b>	N (firm-years)	mean	SD	min	p25	p50	p75	max
<b><u>Comment letters</u></b>								
Received CL	21,820	0.387	0.487	0	0	0	1	1
Received Comp CL	21,820	0.124	0.330	0	0	0	0	1
<b><u>Factors considered by the SEC</u></b>								
IC weak	21,820	0.0164	0.127	0	0	0	0	1
Restatement	21,820	0.0268	0.161	0	0	0	0	1
High volatility	21,820	0.112	0.315	0	0	0	0	1
Log market value	21,820	7.648	1.631	1.326	6.540	7.544	8.700	11.87
<b><u>Firm characteristics</u></b>								
Market to book	21,820	2.012	1.433	0.439	1.207	1.589	2.287	32.47
Firm Age	21,820	17.60	6.208	1	13	18	22	28
Loss	21,820	0.170	0.376	0	0	0	0	1
Low Market to Book	21,820	0.0844	0.278	0	0	0	0	1
Z-Score	21,820	3.787	5.358	-144.2	1.532	2.923	4.755	82.46
Sales Growth	21,820	0.101	0.362	-1	-0.008	0.066	0.158	11.40
Merger acquisition	21,820	0.499	0.500	0	0	0	1	1
Restructuring	21,820	0.408	0.492	0	0	0	1	1
Ext Financing	21,820	-0.0114	0.0875	-1.484	-0.017	0	0	2.163
Segments	21 820	2.713	1.251	0.693	1.791	2.484	3.496	4.605
Leverage	21,742	0.238	0.223	0	0.063	0.216	0.350	4.743
ROA	21,820	0.123	0.123	-2.989	0.080	0.123	0.173	0.516
Annual Return	21,820	0.147	0.582	-1.921	-0.142	0.0860	0.324	4.871
<b><u>Compensation variables</u></b>								
Log Total Compensation	21,820	8.228	0.938	4.937	7.577	8.274	8.894	10.59
<b><u>External (Industry)</u></b>								
Excess Compensation	21,820	0.078	0.661	-2.579	-0.326	0.096	0.481	2.095
Excess CEO pay gap	21 820	0.014	0.918	-3.050	-0.462	0.115	0.580	2.477
Excess CEO pay slice	21 820	0.013	0.103	-0.327	-0.056	0.010	0.072	0.391
Excess TMT pay disparity	21 820	0.012	0.233	-0.504	-0.145	-0.004	0.141	0.846
<b><u>Internal (Firm)</u></b>								
CEO Pay slice	21,820	0.407	0.106	0.0542	0.337	0.405	0.468	0.824

Log CEO pay gap	21,820	7.630	1.192	3.327	6.907	7.762	8.476	10.30
TMT pay disparity	21 820	0.631	0.240	0	0.466	0.616	0.767	1.535
<b><u>CEO characteristics</u></b>								
Female	20,745	0.0406	0.197	0	0	0	0	1
CEO age	20,713	64.42	7.698	42	59	64	70	93
<b><u>Gov. Characteristics</u></b>								
Independent directors	21,820	0.536	0.373	0	0	0.714	0.857	0.944
Independent directors on Comp committee	21 820	0.213	0.174	0	0	0.25	0.333	0.777
CEO member of Comp committee	21 820	0.015	0.121	0	0	0	0	1
CEO Tenure	21,820	6.881	6.835	0	2	5	10	36
CEO Chairman	21,820	0.551	0.497	0	0	1	1	1
CEO turnover	20,745	0.0723	0.259	0	0	0	0	1

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Panel B: General CL vs No CL	CL firm-years	CL firms mean (1)	Non-CL firm-years	No-letter firms mean (2)	Difference (1) – (2)
<b><u>Firm characteristics</u></b>					
High volatility	8,446	0.115	13,374	0.110	0.004
Log market value	8,446	7.815	13,374	7.542	0.272***
Market to book	8,446	1.933	13,374	2.063	-0.130***
Firm Age	8,446	17.37	13,374	17.75	-0.375***
Loss	8,446	0.178	13,374	0.165	0.014***
Low Market to Book	8,446	0.091	13,374	0.079	0.011***
Z-Score	8,446	3.433	13,374	4.010	-0.623***
Sales Growth	8,446	0.104	13,374	0.099	0.004
Merger acquisition	8,446	0.515	13,374	0.488	0.026***
Restructuring	8,446	0.430	13,374	0.395	0.034***
Ext Financing	8,446	0.009	13,374	0.012	-0.003***
Segments	8,446	2.786	13,374	2.667	0.118***
Leverage	8,422	0.249	13,320	0.231	0.238***
ROA	8,446	0.120	13,374	0.125	-0.005***
Annual Return	8,446	0.126	13,374	0.159	-0.033***
<b><u>Compensation variables</u></b>					
Log Total Compensation	8,446	8.344	13,374	8.154	0.189***
<b><u>External (Industry)</u></b>					
Excess Compensation	8,446	0.129	13,374	0.046	0.082***
Excess CEO pay gap	8,446	0.069	13,374	-0.021	0.090***
Excess CEO pay slice	8,446	0.014	13,374	0.012	0.002
Excess TMT pay disparity (with CEO)	8,446	0.021	13,374	0.008	0.013***
<b><u>Internal (Firm)</u></b>					
CEO Pay slice	8,446	0.4071	13,374	0.4074	0.0003
Log CEO pay gap	8,446	7.754	13,374	7.550	0.203***
TMT pay disparity (with CEO)	8,446	0.639	13,374	0.626	0.013***
<b><u>Gov. Characteristics</u></b>					
Independent directors	8,446	0.560	13,374	0.521	0.039***
Independent directors on Comp committee	8,446	0.215	13,374	0.212	0.003
CEO member of Comp committee	8,446	0.012	13,374	0.016	-0.014**
CEO Tenure	8,446	1.678	13,374	1.696	-0.017
CEO Chairman	8,446	0.571	13,374	0.538	0.033***
CEO turnover	8,446	0.067	13,374	0.071	-0.004

<b>Panel C: Comp CL vs No CL</b>	<b>Comp CL firm- years</b>	<b>Comp CL firms mean (1)</b>	<b>Non-CL firm years</b>	<b>No-letter firms mean (2)</b>	<b>Difference (1) – (2)</b>
<b><u>Firm characteristics</u></b>					
High volatility	2,706	0.136	13,374	0.110	0.025***
Log market value	2,706	7.641	13,374	7.542	0.098***
Market to book	2,706	1.867	13,374	2.063	-0.195***
Firm Age	2,706	16.22	13,374	17.75	-1.530***
Loss	2,706	0.171	13,374	0.165	0.006
Low Market to Book	2,706	0.0924	13,374	0.079	0.012**
Z-Score	2,706	3.578	13,374	4.010	-0.431***
Sales Growth	2,706	0.0765	13,374	0.099	-0.022***
Merger acquisition	2,706	0.510	13,374	0.488	0.021**
Restructuring	2,706	0.417	13,374	0.395	0.022**
Ext Financing	2,706	-0.012	13,374	0.012	0.000
Segments	2,706	2.813	13,374	2.667	0.145***
Leverage	2,697	0.236	13,320	0.231	0.005
ROA	2,706	0.127	13,374	0.125	0.003
Annual Return	2,706	0.117	13,374	0.159	-0.042***
<b><u>Compensation variables</u></b>					
Log Total Compensation	2,706	8.242	13,374	8.154	0.087***
<b><u>External (Industry)</u></b>					
Excess Compensation	2,706	0.123	13,374	0.046	0.076***
Excess CEO pay gap	2,706	0.067	13,374	-0.021	0.089***
Excess CEO pay slice	2,706	0.019	13,374	0.012	0.007***
Excess TMT pay disparity (with CEO)	2,706	0.031	13,374	0.008	0.023***
<b><u>Internal (Firm)</u></b>					
CEO Pay slice	2,706	0.407	13,374	0.407	0.000
Log CEO pay gap	2,706	7.645	13,374	7.551	0.093***
TMT pay disparity (with CEO)	2,706	0.640	13,374	0.626	0.014***
<b><u>Gov. Characteristics</u></b>					
Independent directors	2,706	0.548	13,374	0.521	0.027***
Independent directors on Comp committee	2,706	0.212	13,374	0.212	0
CEO member of Comp committee	2,706	0.015	13,374	0.016	-0.001
CEO Tenure	2,706	1.668	13,374	1.696	-0.027
CEO Chairman	2,706	0.608	13,374	0.538	0.069***
CEO turnover	2,706	0.065	13,374	0.071	-0.006

Panel D: Comp CL vs other CL	Comp CL firm-years	Comp CL firms mean (1)	Other CL firm years	Other CL firms mean (2)	Difference (1) – (2)
<b><u>Firm characteristics</u></b>					
High volatility	2,706	0.136	5 740	0.105	0.030***
Log market value	2,706	7.641	5 740	7.897	-0.256***
Market to book	2,706	1.867	5 740	1.963	-0.096***
Firm Age	2,706	16.22	5 740	17.917	-1.699***
Loss	2,706	0.171	5 740	0.181	-0.109
Low Market to Book	2,706	0.0924	5 740	0.090	0.001
Z-Score	2,706	3.578	5 740	3.364	0.213*
Sales Growth	2,706	0.0765	5 740	0.116	-0.040***
Merger acquisition	2,706	0.510	5 740	0.516	-0.006
Restructuring	2,706	0.417	5 740	0.435	-0.018
Segments	2,706	2.813	13,374	2.773	0.039
Ext Financing	2,706	-0.012	5 740	-0.008	-0.004**
Leverage	2,697	0.236	5 725	0.255	-0.019***
ROA	2,706	0.127	5 740	0.116	0.009***
Annual Return	2,706	0.117	5 740	0.130	-0.013
<b><u>Compensation variables</u></b>					
Log Total Compensation	2,706	8.242	5 740	8.392	-0.150***
<b><u>External (Industry)</u></b>					
Excess Compensation	2,706	0.123	5 740	0.131	-0.008
Excess CEO pay gap	2,706	0.067	5 740	0.069	-0.002
Excess CEO pay slice	2,706	0.192	5 740	0.0129	0.006***
Excess TMT pay disparity (with CEO)	2,706	0.031	5 740	0.016	0.015***
<b><u>Internal (Firm)</u></b>					
CEO Pay slice	2,706	0.407	5 740	0.407	0.0003
Log CEO pay gap	2,706	7.645	5 740	7.805	-0.161*
TMT pay disparity (with CEO)	2,706	0.640	5 740	0.639	0.001
<b><u>Gov. Characteristics</u></b>					
Independent directors	2,706	0.548	5 740	0.565	-0.017**
Independent directors on Comp committee	2,706	0.015	5 740	0.011	0.003
CEO member of Comp committee	2,706	0.212	5 740	0.217	-0.005
CEO Tenure	2,706	1.668	5 740	1.683	-0.015
CEO Chairman	2,706	0.608	5 740	0.554	0.053***
CEO turnover	2,706	0.065	5 740	0.067	0.001

**Table 5: Correlation Matrix of the main variables**

This table reports correlations of our main variables in the sample.

Note that the \* shows significance at the .01 level

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	
(1) Comp CL	1.000																										
(2) SUM_IC_WEAK	0.124	1.000																									
(3) Restatement	0.115	0.173	1.000																								
(4) high volatility	0.018	0.010	0.016	1.000																							
(5) ln market cap	-0.003	-0.029	-0.023	-0.345	1.000																						
(6) LMTB	-0.038	-0.021	-0.028	-0.049	0.189	1.000																					
(7) Firm Age	-0.082	-0.024	-0.038	-0.072	0.225	-0.064	1.000																				
(8) Loss	0.001	0.004	0.019	0.362	-0.357	-0.120	-0.029	1.000																			
(9) Low MTB	0.006	0.015	0.005	0.205	-0.284	-0.212	-0.004	0.254	1.000																		
(10) Z score	-0.015	-0.004	-0.023	-0.080	0.070	0.373	-0.066	-0.184	-0.112	1.000																	
(11) Sales Growth	-0.012	-0.013	0.005	-0.009	0.027	0.166	-0.120	-0.109	-0.075	0.067	1.000																
(12) M&A	0.017	0.007	0.006	-0.139	0.155	-0.006	0.004	-0.118	-0.073	-0.003	0.055	1.000															
(13) Restructuring	0.007	0.006	0.010	0.045	0.035	-0.121	0.109	0.149	0.009	-0.119	-0.104	0.115	1.000														
(14) Ext Financing	-0.006	-0.004	0.003	0.098	-0.093	-0.095	-0.034	0.121	0.037	-0.136	0.080	0.026	-0.004	1.000													
(15) Segments	0.031	-0.001	0.005	-0.062	0.183	-0.091	0.116	-0.057	-0.003	-0.065	-0.054	0.051	0.068	-0.007	1.000												
<b>(16) Total comp</b>	<b>0.003</b>	-0.024	-0.019	-0.200	0.723	0.066	0.186	-0.207	-0.151	-0.034	0.018	0.143	0.120	-0.051	0.149	1.000											
<b>(17) Log CEO Pay gap</b>	<b>0.005</b>	-0.020	-0.020	-0.176	0.644	0.059	0.173	-0.185	-0.146	-0.042	0.017	0.129	0.127	-0.043	0.135	0.944	1.000										
<b>(18) CEO Pay slice</b>	-0.012	-0.005	-0.016	-0.046	0.063	0.002	0.068	-0.069	-0.054	-0.033	0.010	0.031	0.013	-0.001	0.026	0.424	0.565	1.000									
<b>(19) TMT pay disparity</b>	<b>0.018</b>	-0.007	0.005	-0.004	0.029	0.013	-0.019	0.038	0.002	-0.026	0.015	0.007	0.019	0.006	-0.018	0.063	0.052	-0.210	1.000								
(20) Board Size	0.018	-0.015	-0.002	-0.117	0.514	-0.115	0.199	-0.102	-0.035	-0.237	-0.082	0.019	0.090	-0.026	0.176	0.380	0.332	-0.024	0.016	1.000							
(21) Indep. directors	0.048	0.020	0.010	-0.215	0.243	-0.025	0.015	-0.180	-0.093	0.071	-0.020	0.090	0.012	-0.070	0.075	0.203	0.194	0.044	-0.043	0.031	1.000						
(22) Indep. Comp Committee	0.076	0.015	0.020	-0.061	-0.142	-0.043	-0.171	-0.066	-0.011	0.060	0.053	0.007	-0.071	-0.027	0.027	-0.118	-0.099	0.016	-0.029	-0.193	0.663	1.000					
(23) CEO comp. committee	0.005	-0.005	-0.002	-0.009	0.025	0.009	-0.035	-0.012	-0.024	0.005	0.005	0.010	0.001	-0.014	0.017	0.006	0.004	-0.003	0.011	0.008	0.011	0.047	1.000				
(24) CEO tenure	0.016	0.008	-0.001	-0.069	-0.043	0.032	-0.053	-0.097	-0.013	0.070	0.056	0.038	-0.154	-0.003	-0.040	0.021	0.016	0.161	-0.147	-0.118	0.125	0.186	-0.014	1.000			
(25) CEO/Chairman	0.059	-0.001	0.004	-0.109	0.142	-0.025	-0.053	-0.145	-0.055	0.012	0.010	0.036	-0.080	-0.023	0.036	0.126	0.127	0.081	-0.023	0.072	0.160	0.169	0.018	0.342	1.000		
(26) CEO turnover	-0.081	-0.032	-0.035	0.025	-0.039	-0.011	0.014	0.059	0.014	-0.025	-0.016	-0.036	0.054	-0.007	0.004	-0.069	-0.052	-0.181	0.216	0.024	-0.028	-0.005	0.008	-0.449	-0.104	1.000	

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	
(1) Comp CL	1.000																										
(2) SUM_IC_WEAK	0.124	1.000																									
(3) Restatement	0.115	0.173	1.000																								
(4) high volatility	0.018	0.010	0.016	1.000																							
(5) ln market cap	-0.003	-0.029	-0.023	-0.345	1.000																						
(6) LMTB	-0.038	-0.021	-0.028	-0.049	0.189	1.000																					
(7) Firm Age	-0.082	-0.024	-0.038	-0.072	0.225	-0.064	1.000																				
(8) Loss	0.001	0.004	0.019	0.362	-0.357	-0.120	-0.029	1.000																			
(9) Low MTB	0.006	0.015	0.005	0.205	-0.284	-0.212	-0.004	0.254	1.000																		
(10) Z score	-0.015	-0.004	-0.023	-0.080	0.070	0.373	-0.066	-0.184	-0.112	1.000																	
(11) Sales Growth	-0.012	-0.013	0.005	-0.009	0.027	0.166	-0.120	-0.109	-0.075	0.067	1.000																
(12) M&A	0.017	0.007	0.006	-0.139	0.155	-0.006	0.004	-0.118	-0.073	-0.003	0.055	1.000															
(13) Restructuring	0.007	0.006	0.010	0.045	0.035	-0.121	0.109	0.149	0.009	-0.119	-0.104	0.115	1.000														
(14) Ext Financing	-0.006	-0.004	0.003	0.098	-0.093	-0.095	-0.034	0.121	0.037	-0.136	0.080	0.026	-0.004	1.000													
(15) Segments	0.031	-0.001	0.005	-0.062	0.183	-0.091	0.116	-0.057	-0.003	-0.065	-0.054	0.051	0.068	-0.007	1.000												
<b>(16) Excess Comp</b>	<b>0.008</b>	-0.009	-0.001	0.024	0.100	0.228	-0.121	0.036	-0.047	0.075	0.198	0.021	-0.007	0.050	-0.077	1.000											
<b>(17) Excess CEO Pay gap</b>	<b>0.008</b>	-0.006	0.002	0.026	0.050	0.193	-0.114	0.035	-0.037	0.062	0.176	0.019	0.012	0.041	-0.071	0.952	1.000										
<b>(18) Excess CEO Pay slice</b>	<b>0.005</b>	0.001	-0.003	-0.015	0.003	0.005	0.013	-0.013	-0.020	-0.035	0.004	0.020	0.023	0.002	0.014	0.411	0.552	1.000									
<b>(19) Excess Pay disparity</b>	<b>0.022</b>	-0.003	0.007	-0.012	0.011	0.025	-0.009	-0.010	-0.023	-0.010	0.023	0.027	0.022	-0.002	0.004	0.455	0.612	0.816	1.000								
(20) Board size	0.018	-0.015	-0.002	-0.117	0.514	-0.115	0.199	-0.102	-0.035	-0.237	-0.082	0.019	0.090	-0.026	0.176	-0.084	-0.108	-0.046	-0.056	1.000							
(21) Indep Directors	0.048	0.020	0.010	-0.215	0.243	-0.025	0.015	-0.180	-0.093	0.071	-0.020	0.090	0.012	-0.070	0.075	-0.018	-0.014	0.001	0.002	0.031	1.000						
(22) Indep. Comp Committee	0.076	0.015	0.020	-0.061	-0.142	-0.043	-0.171	-0.066	-0.011	0.060	0.053	0.007	-0.071	-0.027	0.027	-0.034	-0.023	0.018	0.004	-0.193	0.663	1.000					
(23) CEO comp. committee	0.005	-0.005	-0.002	-0.009	0.025	0.009	-0.035	-0.012	-0.024	0.005	0.005	0.010	0.001	-0.014	0.017	-0.007	-0.009	-0.003	-0.003	0.008	0.011	0.047	1.000				
(24) CEO tenure	0.016	0.008	-0.001	-0.069	-0.043	0.032	-0.053	-0.097	-0.013	0.070	0.056	0.038	-0.154	-0.003	-0.040	0.045	0.019	0.005	0.001	-0.118	0.125	0.186	-0.014	1.000			
(25) CEO/Chairman	0.059	-0.001	0.004	-0.109	0.142	-0.025	-0.053	-0.145	-0.055	0.012	0.010	0.036	-0.080	-0.023	0.036	-0.018	-0.015	0.041	0.034	0.072	0.160	0.169	0.018	0.342	1.000		
(26) CEO turnover	-0.081	-0.032	-0.035	0.025	-0.039	-0.011	0.014	0.059	0.014	-0.025	-0.016	-0.036	0.054	-0.007	0.004	-0.009	0.018	-0.027	0.044	0.024	-0.028	-0.005	0.008	-0.449	-0.104	1.000	



**Table 6: Determinants of receipt of a compensation Comment Letter**

This table reports the results of estimating the likelihood of receiving a compensation comment letter. The dependent variable is a dummy variable that takes the value of 1 if a firm received a CL related to executive compensation, 0 otherwise (either received a CL regarding another topic or did NOT receive a CL). The number of available observations is 21 820 firm-year observations. All independent variables are lagged by one year. Firm, industry and year fixed effects are included. We use robust standard errors clustered at firm and year levels. See Appendix A for variable definitions.

VARIABLES	Dependent variable=1 if a firm received a compensation comment letter						
	(1) Logit	(2) Logit	(3) Logit	(4) Logit	(5) Logit	(6) Logit	(7) Logit
<b><u>External Comp characteristics</u></b>							
Excess CEO pay gap	0.102*** (0.0358)						
Excess CEO pay slice		0.587** (0.292)					
Excess TMT pay disparity			0.362*** (0.130)				
Excess compensation				0.215*** (0.0554)			
<b><u>Internal Comp characteristics</u></b>							
Log CEO pay gap					0.0819*** (0.0259)		
CEO pay slice						0.561*** (0.217)	
TMT pay disparity							0.322*** (0.0951)
<b><u>Governance characteristics</u></b>							
Independent directors	0.109 (0.129)	0.112 (0.129)	0.115 (0.129)	0.109 (0.129)	0.0956 (0.101)	0.100 (0.101)	0.102 (0.101)
CEO Comp committee	-0.151 (0.203)	-0.149 (0.203)	-0.153 (0.203)	-0.152 (0.203)	-0.0220 (0.188)	-0.0246 (0.188)	-0.0242 (0.187)
CEO tenure	0.0376 (0.0386)	0.0349 (0.0387)	0.0422 (0.0386)	0.0397 (0.0386)	0.0007 (0.0265)	-0.0042 (0.0266)	0.0041 (0.0264)
CEO/Chairman	0.0233 (0.108)	0.0240 (0.107)	0.0243 (0.107)	0.0244 (0.108)	0.0311 (0.0498)	0.0334 (0.0497)	0.0326 (0.0497)
<b><u>Section 408 criteria</u></b>							
IC_Weak	1.284*** (0.134)	1.287*** (0.134)	1.283*** (0.134)	1.284*** (0.134)	1.263*** (0.123)	1.266*** (0.123)	1.262*** (0.123)
Restate	1.054*** (0.115)	1.055*** (0.115)	1.050*** (0.115)	1.059*** (0.115)	1.034*** (0.101)	1.034*** (0.101)	1.031*** (0.101)

High Volatility	0.0401 (0.0906)	0.0436 (0.0905)	0.0458 (0.0906)	0.0385 (0.0906)	0.0097 (0.0781)	0.0209 (0.0780)	0.0213 (0.0781)
Log Market value	0.0233 (0.0681)	0.0349 (0.0679)	0.0326 (0.0679)	0.0113 (0.0682)	0.0632*** (0.0225)	0.101*** (0.0186)	0.0966*** (0.0187)
Market to Book	0.0028 (0.0431)	0.0037 (0.0431)	0.0035 (0.0431)	0.0014 (0.0432)	0.0190 (0.0228)	0.0143 (0.0228)	0.0142 (0.0229)
<b><u>Other company characteristics</u></b>							
Firm age	-0.467 (1.242)	-0.462 (1.244)	-0.457 (1.245)	-0.464 (1.240)	-0.0015 (0.0056)	-0.0019 (0.0056)	-0.0022 (0.0056)
Loss	-0.0122 (0.0855)	-0.0133 (0.0855)	-0.0108 (0.0855)	-0.0118 (0.0856)	-0.0411 (0.0703)	-0.0331 (0.0703)	-0.0337 (0.0703)
Low Market to Book	-0.0818 (0.111)	-0.0800 (0.111)	-0.0799 (0.111)	-0.0809 (0.111)	-0.0100 (0.0871)	0.0005 (0.0871)	-0.0004 (0.0871)
Z-score	0.0049 (0.0111)	0.0055 (0.0112)	0.0053 (0.0112)	0.0047 (0.0111)	-0.0009 (0.0056)	-0.0018 (0.0055)	-0.0013 (0.0056)
Sales Growth	-0.0399 (0.0845)	-0.0218 (0.0830)	-0.0264 (0.0833)	-0.0574 (0.0862)	-0.0968 (0.0749)	-0.0935 (0.0747)	-0.0955 (0.0748)
M&A	-0.0308 (0.0646)	-0.0279 (0.0646)	-0.0286 (0.0646)	-0.0330 (0.0646)	0.0166 (0.0489)	0.0183 (0.0490)	0.0156 (0.0490)
Restructuring	0.0948 (0.0713)	0.0970 (0.0713)	0.0972 (0.0713)	0.0951 (0.0713)	0.102* (0.0530)	0.114*** (0.0528)	0.111*** (0.0528)
External Financing	-0.129 (0.313)	-0.126 (0.313)	-0.129 (0.313)	-0.134 (0.313)	-0.0468 (0.267)	-0.0462 (0.267)	-0.0408 (0.267)
Segments	-0.0004 (0.0014)	-0.0004 (0.0014)	-0.0005 (0.0014)	-0.0005 (0.0014)	0.0008 (0.0006)	0.0008 (0.0006)	0.0008 (0.0006)
Observations	21 820	21 820	21 820	21 820	21 820	21 820	21 820
Firm and year FE	Yes	Yes	Yes	Yes			
Industry and year FE					Yes	Yes	Yes
Pseudo-R <sup>2</sup>	0.240	0.240	0.240	0.241	0.187	0.187	0.187
Chi <sup>2</sup>	2573.14***	2569.01***	2573.07***	2580.08***	2978.35***	2974.90***	2979.60***

\*, \*\*, \*\*\* Denote significance levels of 10 percent, 5 percent and 1 percent, respectively. Standard errors are included in parentheses.

**Table 7: Number of letters received**

This table reports the results of regressing CEO compensation characteristics on the number of letters received. The dependent variable is the number of letters related to executive compensation received by a firm in a given year. The number of available observations is 2 706 firm-year observations. All independent variables are lagged by one year. Firm, industry and year fixed effects are included. We use robust standard errors clustered at firm and year levels. See Appendix A for variable definitions.

VARIABLES	Number of letters received						
<b>External Comp</b>	(1) OLS	(2) OLS	(3) OLS	(4) OLS	(5) OLS	(6) OLS	(7) OLS
Excess CEO pay gap	0.0366* (0.0252)						
Excess CEO pay slice		0.225* (0.206)					
Excess TMT pay disparity			0.105 (0.0936)				
Excess compensation				0.0493 (0.0406)			
<b>Internal Comp characteristics</b>							
Log CEO pay gap					0.0446*** (0.0145)		
CEO pay slice						0.288** (0.134)	
TMT pay disparity							0.0966 (0.0658)
<b>Governance characteristics</b>							
Independent directors	-0.0167 (0.0829)	0.0412 (0.0874)	0.0434 (0.0876)	0.0411 (0.0872)	0.0421 (0.0496)	0.0451 (0.0498)	0.0467 (0.0498)
CEO Comp committee	-0.220 (0.159)	-0.226 (0.156)	-0.225 (0.156)	-0.225 (0.157)	-0.0202 (0.107)	-0.0213 (0.107)	-0.0196 (0.107)
CEO tenure	-0.0208 (0.0260)	-0.0184 (0.0258)	-0.0164 (0.0255)	-0.0175 (0.0257)	0.0037 (0.0183)	0.0028 (0.0188)	0.0068 (0.0186)
CEO/Chairman	-0.0207 (0.0641)	-0.0203 (0.0641)	-0.0201 (0.0641)	-0.0215 (0.0642)	0.0114 (0.0182)	0.0133 (0.0185)	0.0136 (0.0184)
<b>Section 408 criteria</b>							
IC_Weak	0.286*** (0.0782)	0.285*** (0.0786)	0.285*** (0.0786)	0.285*** (0.0785)	0.0646 (0.0480)	0.0658 (0.0479)	0.0641 (0.0477)
Restate	-0.0032 (0.0712)	-0.0019 (0.0713)	-0.0062 (0.0713)	-0.0045 (0.0712)	0.0764 (0.0496)	0.0754 (0.0507)	0.0734 (0.0510)

High Volatility	0.0995 (0.0740)	0.0943 (0.0741)	0.0952 (0.0740)	0.0943 (0.0739)	0.0629 (0.0419)	0.0693 (0.0423)	0.0703 (0.0422)
Log Market value	0.0002 (0.0428)	0.0161 (0.0432)	0.0157 (0.0431)	0.0104 (0.0427)	-0.0102 (0.0125)	0.0098 (0.0096)	0.0089 (0.0101)
Market to Book	-0.0209 (0.0265)	-0.0205 (0.0261)	-0.0208 (0.0262)	-0.0214 (0.0262)	-0.0195* (0.0108)	-0.0205* (0.0110)	-0.0206* (0.0110)
<b><u>Company characteristics</u></b>							
Firm age	0.0126 (0.0210)	0.0053 (0.0212)	0.0061 (0.0212)	0.0029 (0.0210)	0.0026 (0.0021)	0.0024 (0.0021)	0.0024 (0.0020)
Loss	-0.0149 (0.0673)	-0.0127 (0.0676)	-0.0137 (0.0676)	-0.0145 (0.0672)	-0.0533 (0.0381)	-0.0487 (0.0372)	-0.0517 (0.0376)
Low Market to Book	-0.0843 (0.0772)	-0.0765 (0.0770)	-0.0771 (0.0771)	-0.0779 (0.0773)	-0.0174 (0.0532)	-0.0128 (0.0525)	-0.0170 (0.0525)
Z-score	-0.0021 (0.0068)	-0.0022 (0.0066)	-0.0021 (0.0066)	-0.0019 (0.0067)	0.0032 (0.0030)	0.0025 (0.0030)	0.0025 (0.0030)
Sales Growth	0.0031 (0.0729)	0.0158 (0.0724)	0.0122 (0.0724)	0.0036 (0.0739)	0.113** (0.0467)	0.119** (0.0461)	0.119** (0.0460)
M&A	-0.0092 (0.0432)	-0.0084 (0.0432)	-0.0077 (0.0432)	-0.0080 (0.0432)	0.0124 (0.0231)	0.0136 (0.0233)	0.0127 (0.0234)
Restructuring	-0.071 (0.0486)	-0.0656 (0.0485)	-0.0660 (0.0485)	-0.0681 (0.0485)	-0.0559** (0.0226)	-0.0466** (0.0228)	-0.0473** (0.0228)
External Financing	-0.357 (0.258)	-0.341 (0.259)	-0.336 (0.259)	-0.339 (0.258)	-0.268** (0.112)	-0.266** (0.111)	-0.252** (0.111)
Segments	-0.0029** (0.0014)	-0.0029** (0.0014)	-0.0030** (0.0014)	-0.0030** (0.0014)	0.0002 (0.0002)	0.0002 (0.0002)	0.0002 (0.0002)
Constant	0.831 (0.515)	0.707 (0.519)	0.691 (0.519)	0.779 (0.512)	0.699*** (0.123)	0.778*** (0.109)	0.820*** (0.106)
Observations	2 706	2 706	2 706	2 706	2 706	2 706	2 706
Firm and year FE	Yes	Yes	Yes	Yes			
Industry and year FE					Yes	Yes	Yes
Adjusted R <sup>2</sup>	0.066	0.069	0.069	0.069	0.056	0.055	0.054
F-test	1.44*	1.44	1.45*	1.44*	4.99***	4.92***	5.21***

\*, \*\*, \*\*\* Denote significance levels of 10 percent, 5 percent and 1 percent, respectively. Standard errors are included in parentheses.

**Table 8: Number of compensation related issue phrases received**

This table reports the results of regressing CEO compensation characteristics on the number of issue phrases received. The dependent variable is the logarithm of the number of compensation issue phrases. The number of available observations is 2 706 firm-year observations. All independent variables are lagged by one year. Firm, industry and year fixed effects are included. We use robust standard errors clustered at firm and year levels. See Appendix A for variable definitions.

VARIABLES	Dependent variable: Logarithm of the number of compensation issue phrases						
	(1) OLS	(2) OLS	(3) OLS	(4) OLS	(5) OLS	(6) OLS	(7) OLS
<b><u>External Comp characteristics</u></b>							
Excess CEO pay gap	0.0329* (0.0187)						
Excess CEO pay slice		0.311** (0.157)					
Excess TMT pay disparity			0.143** (0.0700)				
Excess compensation				0.0458 (0.0308)			
<b><u>Internal Comp characteristics</u></b>							
Log CEO pay gap					0.0340*** (0.0110)		
CEO pay slice						0.279*** (0.100)	
TMT pay disparity							0.109** (0.0419)
<b><u>Governance characteristics</u></b>							
Independent directors	0.0187 (0.0679)	0.0186 (0.0682)	0.0217 (0.0682)	0.0178 (0.0680)	0.0692 (0.0382)	0.0222 (0.0281)	0.0226 (0.0283)
CEO Comp committee	0.214* (0.114)	0.212* (0.113)	0.213* (0.114)	0.214* (0.114)	0.156** (0.0653)	0.160** (0.0652)	0.162** (0.0665)
CEO tenure	-0.0045 (0.0214)	-0.0055 (0.0214)	-0.0027 (0.0213)	-0.0036 (0.0214)	-0.0289** (0.0109)	-0.0314*** (0.0113)	-0.0276** (0.0114)
CEO/Chairman	-0.0750 (0.0469)	-0.0736 (0.0473)	-0.0734 (0.0474)	-0.0740 (0.0471)	0.0303 (0.0205)	0.0322 (0.0209)	0.0323 (0.0207)
<b><u>Section 408 criteria</u></b>							
IC_Weak	0.0624 (0.0622)	0.0633 (0.0623)	0.0630 (0.0624)	0.0629 (0.0624)	0.0302 (0.0359)	0.0340 (0.0362)	0.0325 (0.0356)

Restate	-0.0028 (0.0615)	-0.0004 (0.0613)	-0.0063 (0.0612)	-0.0034 (0.0615)	0.0084 (0.0557)	0.0073 (0.0550)	0.0053 (0.0547)
High Volatility	-0.0369 (0.0499)	-0.0391 (0.0499)	-0.0377 (0.0499)	-0.0370 (0.0499)	-0.0067 (0.0314)	-0.0006 (0.0313)	0.0003 (0.0314)
Log Market value	0.0103 (0.0362)	0.0148 (0.0364)	0.0141 (0.0363)	0.0090 (0.0362)	-0.0020 (0.0086)	0.0122 (0.0080)	0.0111 (0.0081)
Market to Book	-0.0077 (0.0213)	-0.0069 (0.0211)	-0.0073 (0.0213)	-0.0078 (0.0213)	-0.0197* (0.0111)	-0.0201* (0.0109)	-0.0203* (0.0112)
<b><u>Other company characteristics</u></b>							
Firm age	-0.0403*** (0.0149)	-0.0385*** (0.0149)	-0.0374** (0.0148)	-0.0410*** (0.0149)	-0.0008 (0.0022)	-0.0008 (0.0023)	-0.0008 (0.0023)
Loss	0.0012 (0.0505)	0.0031 (0.0505)	0.0016 (0.0504)	-0.0008 (0.0504)	-0.0464* (0.0256)	-0.0391 (0.0254)	-0.0420 (0.0253)
Low Market to Book	0.183** (0.0719)	0.187*** (0.0721)	0.186*** (0.0720)	0.184** (0.0719)	0.111*** (0.0357)	0.115*** (0.0354)	0.111*** (0.0360)
Z-score	-0.0031 (0.0063)	-0.0033 (0.0062)	-0.0032 (0.0063)	-0.0030 (0.0063)	0.0015 (0.0043)	0.0007 (0.0042)	0.0008 (0.0043)
Sales Growth	-0.0360 (0.0544)	-0.0239 (0.0539)	-0.0288 (0.0541)	-0.0345 (0.0530)	-0.0281 (0.0238)	-0.0233 (0.0227)	-0.0237 (0.0229)
M&A	0.0235 (0.0358)	0.0240 (0.0358)	0.0249 (0.0358)	0.0243 (0.0358)	0.0061 (0.0173)	0.0053 (0.0177)	0.0044 (0.0177)
Restructuring	-0.0445 (0.0398)	-0.0405 (0.0396)	-0.0410 (0.0396)	-0.0436 (0.0398)	-0.0452* (0.0268)	-0.0366 (0.0283)	-0.0374 (0.0280)
External Financing	-0.0060 (0.186)	-0.0082 (0.186)	-0.0012 (0.186)	-0.0035 (0.186)	-0.0700 (0.0943)	-0.0733 (0.0948)	-0.0599 (0.0956)
Segments	-0.0017** (0.0006)	-0.0016** (0.0006)	-0.0017** (0.0006)	-0.0017** (0.0006)	0.0002 (0.0002)	0.0002 (0.0002)	0.0002 (0.0002)
Constant	1.032** (0.440)	0.972** (0.440)	0.951** (0.438)	1.048** (0.441)	0.613*** (0.116)	0.699*** (0.106)	0.732*** (0.103)
Observations	2 706	2 706	2 706	2 706	2 706	2 706	2 706
Firm and year FE	Yes	Yes	Yes	Yes			
Industry and year FE					Yes	Yes	Yes
Adjusted R <sup>2</sup>	0.27	0.27	0.27	0.269	0.213	0.212	0.211
F-test	2.62***	2.66***	2.77***	2.53***	21.20***	16.26***	17.66***

\*, \*\*, \*\*\* Denote significance levels of 10 percent, 5 percent and 1 percent, respectively. Standard errors are included in parentheses.

**Table 9: Type of issue phrases received (SEC Regulations vs Accounting)**

This table reports the results of regressing CEO compensation characteristics on the type of issue phrases received. The dependent variable is the logarithm of the number of SEC regulations (Accounting) issue phrases. The number of available observations is 2 706 firm-year observations. All independent variables are lagged by one year. Firm, industry and year fixed effects are included. We use robust standard errors clustered at firm and year levels. See Appendix A for variable definitions.

VARIABLES	The logarithm of the number of SEC regulations issue phrases	The logarithm of the number of accounting standards issue phrases	The logarithm of the number of SEC regulations issue phrases	The logarithm of the number of accounting standards issue phrases	The logarithm of the number of SEC regulations issue phrases	The logarithm of the number of accounting standards issue phrases	The logarithm of the number of SEC regulations issue phrases	The logarithm of the number of accounting standards issue phrases	The logarithm of the number of SEC regulations issue phrases	The logarithm of the number of accounting standards issue phrases	The logarithm of the number of SEC regulations issue phrases	The logarithm of the number of accounting standards issue phrases
	(1) OLS	(2) OLS	(3) OLS	(4) OLS	(5) OLS	(6) OLS	(7) OLS	(8) OLS	(9) OLS	(10) OLS	(11) OLS	(12) OLS
<b><u>External Comp characteristics</u></b>												
Excess CEO pay gap	0.0539** (0.0258)	-0.0156 (0.0167)										
Excess CEO pay slice			0.505** (0.203)	-0.0304 (0.129)								
Excess TMT pay disparity					0.199** (0.0893)	0.0214 (0.0591)						
<b><u>Internal Comp characteristics</u></b>												
Log CEO pay gap							0.0351** (0.0141)	0.0086 (0.0080)				
CEO pay slice									0.409*** (0.127)	-0.0397 (0.0813)		
TMT pay disparity											0.128** (0.0537)	0.0278 (0.0301)
<b><u>Governance characteristics</u></b>												
Independent directors	0.0065 (0.0843)	-0.0034 (0.0635)	0.0063 (0.0850)	-0.0025 (0.0633)	0.0101 (0.0850)	-0.0014 (0.0630)	-0.0047 (0.0341)	0.0299 (0.0201)	-0.0020 (0.0341)	0.0308 (0.0199)	-0.0014 (0.0344)	0.0307 (0.0199)
CEO Comp committee	0.271* (0.159)	-0.0226 (0.126)	0.269* (0.158)	-0.0241 (0.126)	0.271* (0.158)	-0.0253 (0.126)	0.233*** (0.0840)	-0.0632 (0.0770)	0.232*** (0.0825)	-0.0632 (0.0764)	0.234*** (0.0840)	-0.0630 (0.0773)
CEO tenure	-0.0056 (0.0265)	-0.0088 (0.0189)	-0.0071 (0.0264)	-0.0094 (0.0189)	-0.0025 (0.0261)	-0.0098 (0.0188)	-0.0316*** (0.0117)	-0.0038 (0.0101)	-0.0354*** (0.0118)	-0.0023 (0.0101)	-0.0295** (0.0119)	-0.0033 (0.0101)
CEO/Chairman	-0.0730 (0.0616)	-0.0012 (0.0459)	-0.0706 (0.0615)	-0.0027 (0.0458)	-0.0699 (0.0616)	-0.0032 (0.0459)	0.0171 (0.0242)	0.0320 (0.0208)	0.0176 (0.0245)	0.0329 (0.0209)	0.0182 (0.0245)	0.0323 (0.0208)

**Section 408 criteria**

IC_Weak	0.0168 (0.0765)	0.0972 (0.0649)	0.0183 (0.0768)	0.0976 (0.0650)	0.0173 (0.0766)	0.0981 (0.0651)	-0.0120 (0.0495)	0.0579 (0.0434)	-0.0098 (0.0500)	0.0574 (0.0433)	-0.0122 (0.0494)	0.0578 (0.0434)
Restate	-0.120 (0.0784)	0.148*** (0.0496)	-0.116 (0.0781)	0.147*** (0.0496)	-0.125 (0.0782)	0.147*** (0.0495)	-0.131** (0.0652)	0.182*** (0.0289)	-0.131** (0.0647)	0.181*** (0.0289)	-0.133** (0.0647)	0.181*** (0.0288)
High Volatility	-0.0403 (0.0552)	-0.0010 (0.0468)	-0.0437 (0.0556)	-0.0023 (0.0470)	-0.0404 (0.0554)	-0.0036 (0.0470)	-0.0160 (0.0346)	0.0108 (0.0259)	-0.0117 (0.0346)	0.0124 (0.0259)	-0.0102 (0.0346)	0.0122 (0.0258)
Log Market value	0.0478 (0.0431)	-0.0409 (0.0364)	0.0550 (0.0432)	-0.0425 (0.0364)	0.0538 (0.0434)	-0.0424 (0.0364)	-0.0138 (0.0117)	0.0128 (0.0092)	0.0014 (0.0104)	0.0169** (0.0081)	0.0003 (0.0104)	0.0163* (0.0083)
Market to Book	0.0101 (0.0300)	-0.0229 (0.0183)	0.0114 (0.0297)	-0.0232 (0.0182)	0.0108 (0.0301)	-0.0232 (0.0180)	-0.0016 (0.0118)	-0.0279*** (0.0067)	-0.0025 (0.0112)	-0.0280*** (0.0067)	-0.0026 (0.0117)	-0.0282*** (0.0068)

**Other company characteristics**

Firm age	-0.0310* (0.0170)	-0.0110 (0.0138)	-0.0280 (0.0172)	-0.0115 (0.0138)	-0.0268 (0.0170)	-0.0112 (0.0138)	-0.0018 (0.0025)	0.0016 (0.0014)	-0.0021 (0.0026)	0.0016 (0.0014)	-0.0020 (0.0026)	0.0015 (0.0014)
Loss	-0.0131 (0.0618)	0.0217 (0.0457)	-0.0101 (0.0619)	0.0235 (0.0459)	-0.0138 (0.0621)	0.0250 (0.0456)	-0.0592** (0.0283)	0.0145 (0.0225)	-0.0535* (0.0283)	0.0143 (0.0229)	-0.0577** (0.0284)	0.0149 (0.0226)
Low Market to Book	0.282*** (0.0821)	-0.0842 (0.0644)	0.288*** (0.0827)	-0.0846 (0.0643)	0.286*** (0.0824)	-0.0838 (0.0642)	0.129*** (0.0382)	0.0059 (0.0311)	0.137*** (0.0373)	0.0047 (0.0317)	0.131*** (0.0380)	0.0062 (0.0311)
Z-score	-0.0121 (0.0101)	0.0103* (0.0054)	-0.0123 (0.0098)	0.0104* (0.0053)	-0.0122 (0.0099)	0.0104* (0.0053)	-0.0015 (0.0057)	0.0030** (0.0013)	-0.0018 (0.0056)	0.0027* (0.0014)	-0.0019 (0.0057)	0.0029** (0.0014)
Sales Growth	-0.119** (0.0570)	0.0964* (0.0556)	-0.0988* (0.0559)	0.0900 (0.0570)	-0.105* (0.0561)	0.0888 (0.0575)	-0.0214 (0.0325)	-0.0107 (0.0259)	-0.0183 (0.0312)	-0.0090 (0.0252)	-0.0182 (0.0319)	-0.0098 (0.0259)
M&A	0.0273 (0.0460)	0.0039 (0.0328)	0.0281 (0.0459)	0.0038 (0.0328)	0.0294 (0.0460)	0.0039 (0.0328)	0.0092 (0.0229)	-0.0008 (0.0167)	0.0107 (0.0233)	-0.0008 (0.0167)	0.0093 (0.0232)	-0.0008 (0.0167)
Restructuring	-0.0455 (0.0487)	-0.0206 (0.0362)	-0.0389 (0.0484)	-0.0216 (0.0363)	-0.0402 (0.0486)	-0.0210 (0.0362)	-0.0511** (0.0248)	0.0042 (0.0227)	-0.0443* (0.0260)	0.0062 (0.0224)	-0.0451* (0.0255)	0.0057 (0.0226)
External Financing	-0.0409 (0.248)	0.0814 (0.164)	-0.0446 (0.248)	0.0792 (0.164)	-0.0328 (0.248)	0.0781 (0.164)	-0.0054 (0.148)	-0.0588 (0.0852)	-0.0142 (0.149)	-0.0530 (0.0869)	0.0061 (0.149)	-0.0559 (0.0861)
Segments	- 0.0020** (0.0009)	-0.0002 (0.0007)	-0.0020** (0.0009)	-0.0002 (0.0007)	-0.0021** (0.0009)	-0.0002 (0.0007)	0.0001 (0.0002)	0.0001 (0.0002)	0.0001 (0.0002)	0.0001 (0.0002)	0.0001 (0.0002)	0.0001 (0.0002)
Constant	0.321 (0.502)	0.781** (0.389)	0.223 (0.507)	0.799** (0.390)	0.199 (0.501)	0.790** (0.390)	0.465** (0.198)	0.118 (0.137)	0.464** (0.186)	0.166 (0.134)	0.531*** (0.186)	0.136 (0.133)
Observations	2 706	2 706	2 706	2 706	2 706	2 706	2 706	2 706	2 706	2 706	2 706	2 706
Firm and year FE	Yes	Yes	Yes	Yes	Yes	Yes						
Industry and year FE							Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R <sup>2</sup>	0.285	0.095	0.286	0.090	0.285	0.090	0.232	0.095	0.234	0.094	0.232	0.095
F-test	2.58***	1.23	2.68***	1.21	2.57***	1.22	5.96***	16.15***	6.19***	16.37***	5.84***	15.99***

\*, \*\*, \*\*\* Denote significance levels of 10 percent, 5 percent and 1 percent, respectively. Standard errors are included in parentheses.



**Table 10: The number of issue phrases received related to the compensation components categories**

This table reports the results of regressing CEO compensation characteristics on the number of issue phrases received related to compensation components. The dependent variables are (1) The total number of issue phrases received by a firm each year related to Compensation Packages; (2) Stock awards and stock options; (3) Deferred compensation; (4) Taxes; (5) Pension Benefits; (6) Termination Benefits. The number of available observations is 2 706 firm-year observations. All independent variables are lagged by one year. Firm, industry and year fixed effects are included. We use robust standard errors clustered at firm and year levels See Appendix A for variable definitions.

VARIABLES	Murphy Categories											
	(1) Total Compensation Package		2) Stock awards and stock options		(3) Deferred Compensation		(4) Tax		(5) Pension Benefits		(6) Termination Benefits	
	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	
<b><u>External Comp. characteristics</u></b>												
Excess CEO pay gap	0.0240*		0.0122		0.0048		0.0002		-0.0035		0.0064	
	(0.0137)		(0.0111)		(0.0040)		(0.0001)		(0.0067)		(0.0042)	
<b><u>Internal Comp. characteristics</u></b>												
Log CEO pay gap		0.0282**		0.0122		0.0058		0.0001		0.0115*		0.0063
		(0.0144)		(0.0097)		(0.0039)		(0.0001)		(0.00638)		(0.0039)
<b><u>Gov. characteristics</u></b>												
Independent directors	0.0837	0.0818	-0.0017	-0.0025	0.0098	0.0094	-0.0026	-0.0026	0.0375	0.0366	0.0327*	0.0323*
	(0.0580)	(0.0583)	(0.0291)	(0.0293)	(0.0098)	(0.0097)	(0.0020)	(0.0020)	(0.0249)	(0.0247)	(0.0184)	(0.0185)
CEO Comp committee	0.144	0.142	-0.0068	-0.0074	0.0492	0.0490	0.0002	0.0002	0.0397	0.0400	0.0037	0.0034
	(0.132)	(0.132)	(0.0902)	(0.0905)	(0.0307)	(0.0307)	(0.0005)	(0.0005)	(0.0647)	(0.0645)	(0.0321)	(0.0321)
CEO tenure	-0.0316**	-0.0332**	-0.0048	-0.0055	-0.0007	-0.0011	0.0001	0.0001	-0.0154	-0.0166	-0.0095**	-0.0098**
	(0.0151)	(0.0148)	(0.0113)	(0.0113)	(0.0036)	(0.0035)	(0.0001)	(0.0001)	(0.0103)	(0.0100)	(0.0043)	(0.0042)
CEO/Chairman	0.0181	0.0164	0.0079	0.0072	-0.0055	-0.0059	0.0011	0.0011	0.0381	0.0372	-0.0022	-0.0026
	(0.0305)	(0.0305)	(0.0227)	(0.0226)	(0.0056)	(0.0057)	(0.0008)	(0.0008)	(0.0253)	(0.0253)	(0.0089)	(0.0089)
<b><u>Section 408 criteria</u></b>												
IC_Weak	0.0167	0.0175	0.0619	0.0623	0.0072	0.0074	-0.0018	-0.0018	0.0087	0.0088	-0.0165	-0.0163
	(0.0477)	(0.0476)	(0.0415)	(0.0414)	(0.0110)	(0.0111)	(0.0015)	(0.0015)	(0.0432)	(0.0433)	(0.0128)	(0.0128)
Restate	-0.157***	-0.157***	0.206***	0.206***	0.0124	0.0124	0.0033	0.0033	0.0252	0.0261	-0.0157	-0.0157
	(0.0546)	(0.0543)	(0.0302)	(0.0301)	(0.0125)	(0.0125)	(0.0024)	(0.0024)	(0.0252)	(0.0253)	(0.0121)	(0.0120)
High Volatility	-0.0509	-0.0533	0.0505**	0.0496**	-0.0045	-0.0050	0.0022	0.0022	-0.0306	-0.0329	-0.0097	-0.0102
	(0.0369)	(0.0371)	(0.0219)	(0.0221)	(0.0063)	(0.0062)	(0.0015)	(0.0015)	(0.0224)	(0.0222)	(0.0092)	(0.0093)
Log Market value	-0.0103	-0.0220*	-0.0012	-0.0061	0.0006	-0.0018	0.0001	0.0006	0.0178***	0.0122**	0.0015	-0.0010
	(0.0102)	(0.0129)	(0.0083)	(0.0098)	(0.0020)	(0.0030)	(0.0008)	(0.0007)	(0.0057)	(0.0057)	(0.0026)	(0.0031)
Market to Book	-0.0003	0.0019	-0.0096	-0.0085	-0.0018	-0.0014	-0.0020	-0.0020	-0.0108*	-0.0109*	-0.0035	-0.0029
	(0.0134)	(0.0134)	(0.0095)	(0.0098)	(0.0014)	(0.0014)	(0.0014)	(0.0014)	(0.0064)	(0.0063)	(0.0032)	(0.0031)

**Other company characteristics**

Firm age	-0.0029 (0.0023)	-0.0031 (0.0023)	-0.0010 (0.0024)	-0.0011 (0.0024)	0.0002 (0.0005)	0.0007 (0.0005)	-0.0004 (0.0002)	-0.0005 (0.0002)	0.0056*** (0.0012)	0.0057*** (0.0012)	0.0008 (0.0006)	0.0005 (0.0006)
Loss	-0.0437 (0.0304)	-0.0444 (0.0304)	0.0225 (0.0251)	0.0222 (0.0250)	0.0025 (0.0056)	0.0024 (0.0056)	0.0002 (0.0003)	0.0002 (0.0003)	0.0029 (0.0181)	0.0026 (0.0180)	-0.0224*** (0.0076)	-0.0225*** (0.0076)
Low Market to Book	0.0772* (0.0402)	0.0747* (0.0403)	0.0730* (0.0380)	0.0716* (0.0378)	0.0158 (0.0100)	0.0153 (0.0099)	-0.0012 (0.0009)	-0.0012 (0.0009)	-0.0053 (0.0295)	-0.0043 (0.0293)	0.0273* (0.0146)	0.0266* (0.0143)
Z-score	0.0007 (0.0061)	0.0010 (0.0061)	0.0046* (0.0023)	0.0047** (0.0023)	0.0007 (0.0003)	0.0001 (0.0003)	0.0009 (0.0006)	0.0009 (0.0006)	-0.0043*** (0.0010)	-0.0040*** (0.0010)	-0.0004 (0.0007)	0.0003 (0.0006)
Sales Growth	-0.0320 (0.0501)	-0.0265 (0.0503)	-0.0154 (0.0282)	-0.0123 (0.0270)	-0.0060 (0.0048)	-0.0049 (0.0040)	0.0040 (0.0036)	0.0041 (0.0037)	-0.0054 (0.0195)	-0.0087 (0.0197)	-0.0038 (0.0178)	-0.0021 (0.0176)
M&A	0.0190 (0.0235)	0.0193 (0.0236)	0.0084 (0.0238)	0.0086 (0.0238)	0.0018 (0.0058)	0.0018 (0.0058)	0.0003 (0.0003)	0.0003 (0.0003)	-0.0031 (0.0127)	-0.0033 (0.0126)	-0.0103 (0.0080)	-0.0102 (0.0081)
Restructuring	-0.0834*** (0.0296)	-0.0868*** (0.0295)	-0.0030 (0.0160)	-0.0042 (0.0162)	-0.0059 (0.0052)	-0.0066 (0.0052)	0.0014 (0.0012)	0.0014 (0.0012)	0.0137 (0.0207)	0.0107 (0.0207)	-0.0063 (0.0093)	-0.0070 (0.0094)
External Financing	-0.138 (0.138)	-0.141 (0.138)	-0.0863 (0.129)	-0.0867 (0.129)	0.0050 (0.0235)	0.0044 (0.0237)	0.0153 (0.0110)	0.0153 (0.0110)	-0.102** (0.0443)	-0.108** (0.0447)	-0.0465 (0.0389)	-0.0466 (0.0389)
Segments	-0.0002 (0.0003)	-0.0002 (0.0003)	0.0002 (0.0002)	0.0002 (0.0002)	0.0002 (0.0007)	0.0002 (0.0006)	-0.0002 (0.0002)	-0.0006 (0.0003)	0.0002 (0.0001)	0.0002 (0.0001)	0.0001 (0.0001)	0.0001 (0.0001)
Constant	0.423*** (0.139)	0.303* (0.154)	0.354*** (0.117)	0.301** (0.118)	-0.0089 (0.0214)	-0.0340 (0.0278)	-0.0007 (0.0018)	-0.0013 (0.0020)	-0.0247 (0.0809)	-0.0691 (0.0962)	0.0599 (0.0484)	0.0328 (0.0544)
Observations	2 706	2 706	2 706	2 706	2 706	2 706	2 706	2 706	2 706	2 706	2 706	2 706
Firm and year FE	Yes		Yes		Yes		Yes		Yes		Yes	
Industry and year FE		Yes		Yes		Yes		Yes		Yes		Yes
Adjusted R <sup>2</sup>	0.182	0.182	0.075	0.075	0.036	0.036	0.047	0.047	0.057	0.057	0.084	0.084
F-test	4.89***	5.17***	10.24***	10.25***	3.11***	3.07***	1.24	1.44	7.67***	7.53***	3.93***	3.90***

\*, \*\*, \*\*\* Denote significance levels of 10 percent, 5 percent and 1 percent, respectively. Standard errors are included in parentheses.

**Table 11: The number of issue phrases related to the required SEC tables**

This table reports the results of regressing CEO compensation characteristics on the number of issue phrases received related to the required SEC tables. The dependent variables are (1) The logarithm of the total number of issue phrases received by a firm in a given year related to Summary Compensation; (2) Share-Based Payments; (3) Option Exercises; (4) Grants of Plan Based Awards; (5) Outstanding Equity Awards; (6) Golden Parachutes; (7) Stock Options. The number of available observations is 2 706 firm year observations. All independent variables are lagged by one year. Firm, industry and year fixed effects are included. We use robust standard errors clustered at firm and year levels See Appendix A for variable definitions.

VARIABLES	Legal and Accounting Reports													
	(1) Summary Compensation		(2) Share-Based payments		(3) Options exercises		(4) Grants of Plan Based Awards		(5) Outstanding Equity awards		(6) Golden Parachute		(7) Stock Options	
	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
<b><u>External Comp. characteristics</u></b>														
Excess CEO pay gap	0.0153*		0.0067		0.0086		-0.0028		0.0019		-0.0001		-0.0059	
	(0.0084)		(0.0149)		(0.0065)		(0.0085)		(0.0054)		(0.0018)		(0.0067)	
<b><u>Internal Comp. characteristics</u></b>														
Log CEO pay gap		0.0090*		0.0116		0.0040		0.0060		0.0033		0.0006		0.0003
		(0.0050)		(0.0080)		(0.0038)		(0.0056)		(0.0035)		(0.0007)		(0.0036)
<b><u>Gov. characteristics</u></b>														
Independent directors	0.0463	0.0356*	0.0344	0.0141	-0.0071	-0.0112	0.0648**	0.0296*	-0.0087	-0.0010	-0.0018	0.0003	0.0106	-0.0018
	(0.0287)	(0.0208)	(0.0506)	(0.0283)	(0.0285)	(0.0149)	(0.0329)	(0.0153)	(0.0101)	(0.0080)	(0.0029)	(0.002)	(0.0208)	(0.0141)
CEO Comp committee	0.136*	0.0924**	0.0324	-0.0092	0.0183	0.0012	0.0196	-0.0142	-0.0127	-0.0192***	0.0037*	-0.0001	-0.0093	0.0154
	(0.0701)	(0.0460)	(0.0896)	(0.0744)	(0.0419)	(0.0307)	(0.0551)	(0.0402)	(0.0113)	(0.0063)	(0.0021)	(0.0011)	(0.0242)	(0.0253)
CEO tenure	0.0137	-0.0012	-0.0099	-0.0061	0.0038	0.0016	-0.0213*	-0.0097*	0.0001	0.00442*	0.0029	-0.0001	0.0117*	0.0065
	(0.0096)	(0.0048)	(0.0172)	(0.0079)	(0.0098)	(0.0049)	(0.0116)	(0.0049)	(0.0037)	(0.0026)	(0.0019)	(0.0006)	(0.0060)	(0.0043)
CEO/Chairman	-0.0192	-0.0027	-0.0021	0.0115	0.0346	-0.0021	-0.0097	0.0101	-0.0039	-0.0038	-0.0035	0.0021	-0.0223	-0.0076
	(0.0253)	(0.0077)	(0.0414)	(0.0158)	(0.0216)	(0.0062)	(0.0278)	(0.0125)	(0.0093)	(0.0057)	(0.0058)	(0.0019)	(0.0157)	(0.0052)
<b><u>Section 408 criteria</u></b>														
IC_Weak	0.0034	-0.0136	0.139**	0.0808**	0.0190	-0.0051	-0.0060	-0.0029	-0.0168*	-0.0130***	-0.0002	-0.0013	-0.0001	-0.0090
	(0.0254)	(0.0178)	(0.0578)	(0.0347)	(0.0263)	(0.0152)	(0.0320)	(0.0237)	(0.0097)	(0.0030)	(0.0018)	(0.0008)	(0.0195)	(0.0135)
Restate	-0.0436*	-0.0264*	0.180***	0.199***	0.0247	0.0324*	-0.0008	-0.0017	0.0021	-0.0072	0.0002	-0.0009	-0.0169	0.00186
	(0.0250)	(0.0142)	(0.0480)	(0.0301)	(0.0275)	(0.0178)	(0.0280)	(0.0150)	(0.0127)	(0.0059)	(0.0011)	(0.0007)	(0.0186)	(0.0122)
High Volatility	-0.0305	0.0033	0.0579	0.0281	-0.0212	-0.0164*	0.0049	0.0365***	0.0024	-0.0037	-0.0019	-0.0002	-0.0037	0.0129
	(0.0249)	(0.0170)	(0.0436)	(0.0214)	(0.0193)	(0.0088)	(0.0227)	(0.0128)	(0.0102)	(0.0073)	(0.0024)	(0.0012)	(0.0135)	(0.0103)
Log Market value	-0.0030	-0.0086*	-0.0307	-0.0099	0.0173	-0.0002	0.0005	-0.0024	0.0028	-0.0053	0.0003	0.0004	-0.0075	0.00381
	(0.0189)	(0.0049)	(0.0325)	(0.0068)	(0.0137)	(0.0040)	(0.0191)	(0.0050)	(0.0070)	(0.0035)	(0.0028)	(0.0006)	(0.0141)	(0.00413)
Market to Book	0.0297***	0.0005	-0.0006	-0.0109**	0.0001	0.0025	-0.0027	0.0016	-0.0056	0.0005	-0.0023	-0.0017	-0.0031	-0.00392
	(0.0105)	(0.0048)	(0.0158)	(0.0052)	(0.0094)	(0.0041)	(0.0128)	(0.0046)	(0.0048)	(0.0014)	(0.0016)	(0.0011)	(0.0076)	(0.00281)

**Other company characteristics**

Firm age	-0.0002 (0.0083)	-0.0003 (0.0011)	-0.0187* (0.0103)	-0.0015 (0.0017)	-0.0049 (0.0039)	0.0001 (0.0007)	-0.0100 (0.0063)	-0.0005 (0.0013)	0.0006 (0.0016)	0.0005 (0.0004)	-0.0005 (0.0004)	0.0001 (0.0002)	0.0088** (0.0041)	-0.0001 (0.0006)
Loss	-0.0134 (0.0186)	-0.0328*** (0.0097)	0.0074 (0.0396)	-0.0049 (0.0183)	0.0429** (0.0169)	0.0308** (0.0119)	0.0095 (0.0211)	-0.0068 (0.0119)	-0.0087 (0.0095)	-0.0011 (0.0053)	-0.0016 (0.0029)	-0.0008 (0.0011)	-0.0105 (0.0174)	0.0117 (0.0118)
Low Market to Book	0.0739** (0.0327)	0.0501*** (0.0152)	-0.0569 (0.0573)	0.0325 (0.0286)	0.0622** (0.0262)	0.0226 (0.0147)	0.0579* (0.0316)	0.0396** (0.0168)	0.0492** (0.0216)	0.0249** (0.0119)	0.0088 (0.0062)	0.0078 (0.0046)	0.0125 (0.0181)	0.0063 (0.0126)
Z-score	-0.0075*** (0.0027)	-0.0006 (0.0012)	0.0046 (0.0049)	0.0043** (0.0017)	-0.0020 (0.0018)	0.0010 (0.0013)	-0.0043 (0.0027)	-0.0004 (0.0011)	0.0009 (0.0013)	-0.0006 (0.0007)	0.0003 (0.0004)	0.0008 (0.0001)	0.0041* (0.0023)	0.0024** (0.0011)
Sales Growth	-0.0602*** (0.0219)	-0.0123 (0.0098)	0.0717 (0.0530)	0.0073 (0.0211)	-0.0075 (0.0161)	0.0032 (0.0086)	-0.0033 (0.0196)	-0.0224** (0.0112)	-0.0056 (0.0099)	-0.0057 (0.0050)	0.0260 (0.0273)	0.0149 (0.0151)	-0.0003 (0.0148)	-0.0151 (0.0094)
M&A	-0.00104 (0.0153)	0.0017 (0.0096)	0.0012 (0.0267)	0.0005 (0.0164)	-0.0050 (0.0141)	-0.0024 (0.0085)	0.0107 (0.0160)	0.0096 (0.0111)	-0.0086 (0.0095)	0.0011 (0.0053)	-0.0032 (0.0025)	-0.0016 (0.0015)	-0.0148 (0.0129)	0.0028 (0.0056)
Restructuring	-0.0425** (0.0189)	-0.0123 (0.0090)	0.0102 (0.0297)	0.0130 (0.0125)	-0.0094 (0.0177)	0.0025 (0.0080)	0.0129 (0.0195)	-0.0150* (0.0085)	-0.0180* (0.0095)	-0.0094** (0.0039)	0.0026 (0.0043)	-0.0011 (0.0017)	-0.0130 (0.0130)	-0.0049 (0.0088)
External Financing	0.0850 (0.0833)	-0.0125 (0.0533)	0.0756 (0.143)	-0.0591 (0.100)	0.0411 (0.0653)	0.0185 (0.0500)	-0.134 (0.0866)	-0.0104 (0.0408)	-0.0091 (0.0461)	-0.0172 (0.0169)	-0.0080 (0.0130)	-0.0081 (0.0088)	0.0157 (0.0718)	-0.0356 (0.0375)
Segments	-0.0004 (0.0003)	0.0001 (0.0001)	-0.0004 (0.0006)	0.0004 (0.0001)	-0.0005** (0.0002)	0.0001 (0.0001)	-0.0001 (0.0003)	0.0002 (0.0001)	-0.0004 (0.0007)	0.0002*** (0.0006)	0.0007 (0.0006)	0.0001 (0.0002)	-0.0009 (0.0001)	-0.0001* (0.0009)
Constant	-0.147 (0.247)	-0.0145 (0.0429)	0.733** (0.318)	0.293*** (0.0860)	-0.106 (0.127)	-0.0421 (0.0363)	0.0647 (0.200)	0.0144 (0.0639)	0.0071 (0.0578)	0.0074 (0.015)	-0.002 (0.018)	-0.0058 (0.0049)	-0.0870 (0.141)	-0.0431 (0.0309)
Observations	2 706	2 706	2 706	2 706	2 706	2 706	2 706	2 706	2 706	2 706	2 706	2 706	2 706	2 706
Firm and year FE	Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Industry and year FE		Yes		Yes		Yes		Yes		Yes		Yes		Yes
Adjusted R <sup>2</sup>	0.087	0.042	0.090	0.084	0.041	0.027	0.062	0.036	0.050	0.040	0.056	0.038	0.030	0.019
F-test	2.71***	3.70***	2.42***	16.19***	2.17***	3.47***	1.59***	1.92***	1.10	7.61***	0.35	1.56**	0.89	3.61***

\*, \*\*, \*\*\* Denote significance levels of 10 percent, 5 percent and 1 percent, respectively. Standard errors are included in parentheses.

**Table 12: The number of issue phrases related to informational functions**

This table reports the results of regressing CEO compensation characteristics on the number of issue phrases received related to informational functions. The dependent variables are (1) The log of the total number of issue phrases received by a firm in a given year related to the Methodology employed; (2) Content of tables; (3) Justification of compensation policies and practices; (4) Format and Standardization of tables. The number of available observations is 2 706 firm year observations. All independent variables are lagged by one year. Firm and year fixed effects are included. We use robust standard errors clustered at firm and year levels See Appendix A for variable definitions.

VARIABLES	Informational functions							
	(1) Methodology OLS		(2) Content OLS		(3) Format and Standardization OLS		(4) Justification OLS	
<b><u>External Comp. characteristics</u></b>								
Excess CEO pay gap	-0.0032 (0.0174)		0.0181 (0.0194)		0.0311 (0.0198)		0.0393 (0.0243)	
<b><u>Internal Comp. characteristics</u></b>								
Log CEO pay gap		0.0113 (0.00677)		0.0232** (0.0099)		0.0224** (0.0109)		0.0272* (0.0149)
<b><u>Gov. characteristics</u></b>								
Independent directors	0.0568 (0.0601)	0.0423 (0.0287)	0.0605 (0.0667)	0.0266 (0.0362)	0.104 (0.0688)	0.0526 (0.0415)	0.125 (0.0942)	0.0793 (0.0517)
CEO Comp committee	0.0715 (0.0996)	0.0158 (0.0748)	0.166 (0.123)	0.0950 (0.0884)	0.102 (0.122)	0.0558 (0.0824)	0.195 (0.169)	0.150 (0.124)
CEO tenure	-0.0133 (0.0181)	-0.0073 (0.0110)	-0.0152 (0.0237)	-0.0242* (0.0123)	-0.0185 (0.0241)	-0.0301** (0.0134)	-0.0143 (0.0285)	-0.0373** (0.0153)
CEO/Chairman	-0.0195 (0.0450)	0.0361* (0.0209)	-0.0726 (0.0602)	0.0267 (0.0296)	-0.0802 (0.0623)	0.0378 (0.0312)	-0.0598 (0.0636)	0.0169 (0.0322)
<b><u>Section 408 criteria</u></b>								
IC_Weak	0.121** (0.0602)	0.0612** (0.0280)	0.0489 (0.0615)	0.0161 (0.0537)	0.0029 (0.0576)	-0.0190 (0.0551)	0.0719 (0.0788)	0.0684 (0.0480)
Restate	0.0798* (0.0474)	0.143*** (0.0232)	0.137** (0.0655)	0.109*** (0.0391)	0.0584 (0.0659)	0.0499 (0.0398)	-0.131* (0.0756)	-0.0998* (0.0550)
High Volatility	-0.0037 (0.0477)	0.0084 (0.0238)	-0.0376 (0.0538)	-0.0124 (0.0417)	-0.0585 (0.0528)	-0.0252 (0.0396)	-0.0077 (0.0647)	-0.0298 (0.0405)
Log Market value	-0.0307 (0.0348)	0.0027 (0.0083)	-0.0192 (0.0429)	-0.0091 (0.0110)	-0.0261 (0.0398)	-0.0079 (0.0109)	0.0619 (0.0469)	-0.0201* (0.0117)
Market to Book	-0.0232 (0.0173)	-0.0227*** (0.0081)	0.0055 (0.0276)	-0.0128 (0.0139)	0.0076 (0.0268)	-0.0051 (0.0133)	0.0053 (0.0280)	0.0026 (0.0110)

**Other company characteristics**

Firm age	-0.0013 (0.0121)	-0.0005 (0.0016)	-0.0056 (0.0136)	0.00467* (0.0027)	0.0010 (0.0164)	0.0046** (0.0023)	-0.0760*** (0.0232)	-0.0046* (0.0023)
Loss	0.0371 (0.0453)	-0.0076 (0.0218)	0.0105 (0.0504)	-0.0061 (0.0299)	0.0004 (0.0485)	-0.0284 (0.0275)	0.0404 (0.0621)	-0.0261 (0.0320)
Low Market to Book	-0.0520 (0.0606)	0.0267 (0.0291)	0.119 (0.0750)	0.0858** (0.0391)	0.138** (0.0705)	0.0901** (0.0427)	0.129 (0.0859)	0.0665* (0.0379)
Z-score	0.00643 (0.0047)	0.0029** (0.0013)	0.0027 (0.0060)	0.0011 (0.0030)	0.0001 (0.0064)	-0.0020 (0.0035)	-0.0094 (0.0073)	0.0028 (0.0053)
Sales Growth	0.0471 (0.0576)	-0.0189 (0.0325)	0.0661 (0.0447)	0.0104 (0.0297)	0.0144 (0.0438)	-0.0029 (0.0297)	-0.0190 (0.0562)	-0.0098 (0.0399)
M&A	0.0064 (0.0318)	0.0007 (0.0155)	-0.0094 (0.0370)	0.0126 (0.0211)	-0.0024 (0.0367)	0.0038 (0.0219)	-0.0097 (0.0480)	0.0163 (0.0258)
Restructuring	-0.0031 (0.0333)	0.0074 (0.0191)	-0.0230 (0.0430)	-0.0152 (0.0217)	-0.0268 (0.0430)	-0.0285 (0.0222)	-0.0277 (0.0521)	-0.0727** (0.0300)
External Financing	0.0517 (0.167)	-0.107 (0.0861)	-0.0748 (0.180)	-0.109 (0.111)	0.0050 (0.187)	-0.0384 (0.114)	-0.408* (0.230)	-0.265** (0.104)
Segments	-0.0004 (0.0006)	0.0003 (0.0001)	-0.0020** (0.0008)	0.0004 (0.0002)	-0.0017** (0.0008)	0.0005** (0.0002)	-0.0009 (0.0010)	-0.0001 (0.0003)
Constant	0.538 (0.368)	0.215* (0.120)	0.493 (0.446)	0.205 (0.178)	0.303 (0.472)	0.149 (0.157)	0.630 (0.641)	0.394*** (0.130)
Observations	2 706	2 706	2 706	2 706	2 706	2 706	2 706	2 706
Firm and year FE	Yes		Yes		Yes		Yes	
Industry and year FE		Yes		Yes		Yes		Yes
Adjusted R <sup>2</sup>	0.064	0.065	0.066	0.066	0.063	0.047	0.202	0.157
F-test	0.96	7.06***	1.67**	5.33***	1.23	5.83***	2.02***	5.42***

\*, \*\*, \*\*\* Denote significance levels of 10 percent, 5 percent and 1 percent, respectively. Standard errors are included in parentheses.

**Table 13: Time to resolution of a Conversation Thread**

This table reports the results of regressing CEO compensation characteristics on the time to resolution of a conversation thread. The dependent variable is the logarithm of duration of a Conv Thread per firm year: 1) we take the maximum duration in days when we have more than one Conv Thread per firm year; (2) We take the total number of days when we have more than one Conv Thread. The number of available observations is 2 706 firm-year observations. All independent variables are lagged by one year. Firm, industry and year fixed effects are included. We use robust standard errors clustered at firm and year levels. See Appendix A for variable definitions.

VARIABLES	(1) Total Conv Durations in a firm-year	(2) Maximum Conv duration in a firm-year	(3) Total Conv Durations in a firm-year	(4) Maximum Conv duration in a firm-year	(5) Total Conv Durations in a firm-year	(6) Maximum Conv duration in a firm-year	(7) Total Conv Durations in a firm-year	(8) Maximum Conv duration in a firm-year	(9) Total Conv Durations in a firm-year	(10) Maximum Conv duration in a firm-year	(11) Total Conv Durations in a firm-year	(12) Maximum Conv duration in a firm-year
<b>External Comp. characteristics</b>	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
Excess CEO pay gap	0.0797** (0.0330)	0.0826** (0.0336)										
Excess CEO pay slice			0.688** (0.272)	0.734*** (0.275)								
Excess TMT pay disparity					0.201 (0.122)	0.212* (0.124)						
<b>Internal Comp. characteristics</b>												
Log CEO pay gap							0.0484** (0.0200)	0.0530*** (0.0199)				
CEO pay slice									0.301** (0.147)	0.338** (0.148)		
TMT pay disparity											0.113* (0.0662)	0.128* (0.0717)
<b>Gov. characteristics</b>												
Indep. directors	0.154 (0.119)	0.160 (0.119)	0.153 (0.118)	0.159 (0.119)	0.156 (0.119)	0.162 (0.119)	0.126** (0.0517)	0.129** (0.0535)	0.130** (0.0521)	0.133** (0.0543)	0.132** (0.0522)	0.135** (0.0543)
CEO Comp comm.	0.0747 (0.145)	0.0741 (0.146)	0.0727 (0.144)	0.0717 (0.145)	0.0779 (0.145)	0.0773 (0.146)	0.0551 (0.142)	0.0786 (0.151)	0.0540 (0.142)	0.0773 (0.151)	0.0559 (0.142)	0.0795 (0.151)
CEO tenure	-0.0394 (0.0328)	-0.0330 (0.0335)	-0.0411 (0.0326)	-0.0350 (0.0333)	-0.0348 (0.0326)	-0.0282 (0.0333)	-0.0170 (0.0174)	-0.0105 (0.0179)	-0.0177 (0.0179)	-0.0116 (0.0184)	-0.0136 (0.0177)	-0.0068 (0.0183)
CEO/Chairman	-0.0084 (0.101)	-0.0277 (0.104)	-0.0045 (0.101)	-0.0237 (0.104)	-0.0025 (0.101)	-0.0216 (0.103)	0.0389 (0.0379)	0.0359 (0.0374)	0.0411 (0.0381)	0.0381 (0.0377)	0.0413 (0.0383)	0.0383 (0.0379)
<b>Section 408 criteria</b>												
IC_Weak	0.334*** (0.0917)	0.318*** (0.0909)	0.336*** (0.0918)	0.320*** (0.0910)	0.334*** (0.0929)	0.318*** (0.0921)	0.181** (0.0846)	0.155* (0.0879)	0.182** (0.0844)	0.157* (0.0876)	0.181** (0.0848)	0.155* (0.0881)

Restate	0.238*** (0.0838)	0.215** (0.0854)	0.244*** (0.0839)	0.221*** (0.0854)	0.234*** (0.0832)	0.211** (0.0848)	0.315*** (0.0629)	0.293*** (0.0634)	0.313*** (0.0629)	0.292*** (0.0633)	0.311*** (0.0635)	0.289*** (0.0639)
High Volatility	0.0160 (0.0811)	0.0212 (0.0829)	0.0122 (0.0814)	0.0168 (0.0831)	0.0191 (0.0812)	0.0242 (0.0829)	0.0152 (0.0551)	0.0383 (0.0541)	0.0222 (0.0551)	0.0459 (0.0539)	0.0232 (0.0546)	0.0471 (0.0535)
Log Market value	0.0898 (0.0550)	0.0805 (0.0570)	0.100* (0.0548)	0.0914 (0.0566)	0.0984* (0.0548)	0.0894 (0.0566)	0.0281* (0.0165)	0.0293* (0.0168)	0.0500*** (0.0147)	0.0532*** (0.0152)	0.0489*** (0.0147)	0.0519*** (0.0152)
Market to Book	-0.0709* (0.0362)	-0.0687* (0.0375)	-0.0690* (0.0356)	-0.0667* (0.0371)	-0.0698* (0.0359)	-0.0675* (0.0373)	-0.0276* (0.0146)	-0.0308** (0.0148)	-0.0286* (0.0145)	-0.0319** (0.0147)	-0.0287* (0.0144)	-0.0321** (0.0146)
<b><u>Other company characteristics</u></b>												
Firm age	-0.120*** (0.0278)	-0.111*** (0.0286)	-0.116*** (0.0283)	-0.107*** (0.0291)	-0.115*** (0.0280)	-0.106*** (0.0288)	0.0027 (0.0043)	0.0016 (0.0044)	0.0025 (0.0043)	0.0014 (0.0044)	0.0025 (0.0043)	0.0013 (0.0044)
Loss	-0.0255 (0.0805)	-0.0352 (0.0807)	-0.0224 (0.0807)	-0.0315 (0.0810)	-0.0301 (0.0807)	-0.0398 (0.0809)	0.0397 (0.0582)	0.0411 (0.0592)	0.0446 (0.0579)	0.0466 (0.0588)	0.0414 (0.0573)	0.0430 (0.0582)
Low Market to Book	-0.180 (0.112)	-0.131 (0.113)	-0.172 (0.112)	-0.123 (0.113)	-0.176 (0.112)	-0.127 (0.113)	-0.0254 (0.0768)	0.0079 (0.0722)	-0.0206 (0.0762)	0.0133 (0.0718)	-0.0247 (0.0758)	0.0088 (0.0712)
Z-score	-0.0115 (0.0086)	-0.0142* (0.0086)	-0.0118 (0.0084)	-0.0146* (0.0084)	-0.0118 (0.0084)	-0.0145* (0.0083)	-0.0019 (0.0040)	-0.0036 (0.0040)	-0.0027 (0.0039)	-0.0044 (0.0039)	-0.0027 (0.0039)	-0.0044 (0.0039)
Sales Growth	-0.0604 (0.0754)	-0.118 (0.0765)	-0.0307 (0.0748)	-0.0878 (0.0753)	-0.0361 (0.0750)	-0.0935 (0.0759)	0.0846 (0.0617)	0.0812 (0.0637)	0.0906 (0.0616)	0.0876 (0.0634)	0.0903 (0.0615)	0.0873 (0.0634)
M&A	0.0341 (0.0585)	0.0300 (0.0587)	0.0354 (0.0584)	0.0313 (0.0585)	0.0366 (0.0581)	0.0326 (0.0583)	0.0123 (0.0316)	0.0103 (0.0322)	0.0135 (0.0316)	0.0117 (0.0321)	0.0125 (0.0313)	0.0106 (0.0318)
Restructuring	0.0160 (0.0665)	0.0128 (0.0668)	0.0252 (0.0666)	0.0225 (0.0668)	0.0224 (0.0670)	0.0195 (0.0673)	-0.0061 (0.0426)	-0.0019 (0.0412)	0.0039 (0.0415)	0.0090 (0.0401)	0.0030 (0.0415)	0.0080 (0.0401)
External Financing	0.455 (0.312)	0.459 (0.316)	0.451 (0.308)	0.454 (0.313)	0.468 (0.311)	0.472 (0.315)	0.101 (0.186)	0.0953 (0.198)	0.104 (0.190)	0.0980 (0.203)	0.119 (0.194)	0.114 (0.206)
Segments	-0.0006 (0.0014)	-0.0010 (0.0014)	-0.000661 (0.00140)	-0.0010 (0.0014)	-0.0007 (0.0013)	-0.0012 (0.0014)	-0.0006 (0.0004)	-0.00002 (0.0004)	-0.00004 (0.0003)	-0.00008 (0.0004)	-0.00004 (0.0003)	-0.00005 (0.0004)
Constant	4.880*** (0.759)	4.963*** (0.778)	4.741*** (0.771)	4.817*** (0.790)	4.732*** (0.763)	4.808*** (0.782)	4.031*** (0.394)	4.043*** (0.394)	4.120*** (0.397)	4.138*** (0.396)	4.157*** (0.391)	4.179*** (0.388)
Observations	2 706	2 706	2 706	2 706	2 706	2 706	2 706	2 706	2 706	2 706	2 706	2 706
Firm and year FE	Yes	Yes	Yes	Yes	Yes	Yes						
Industry and year FE							Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R <sup>2</sup>	0.188	0.192	0.188	0.193	0.185	0.190	0.168	0.171	0.167	0.170	0.167	0.169
F-test	4.20***	3.79***	4.13***	3.78***	4.15***	3.75***	8.21***	8.11***	8.10***	8.09***	8.25***	8.23***

\*, \*\*, \*\*\* Denote significance levels of 10 percent, 5 percent and 1 percent, respectively. Standard errors are included in parentheses.



**Table 14: Persistence of compensation issue phrases (IP) over the period**

This table reports the results of regressing CEO compensation characteristics on the persistence of compensation issue phrases received. The dependent variable is (1) The Number of persistent IPs; (2) The proportion of persistent IP; (3) The Number of new IP; (4) The proportion of new IP. The number of available observations is 2 706 firm-year observations. All independent variables are lagged by one year. Firm, industry and year fixed effects are included. See Appendix A for variable definitions.

VARIABLES	(1) Total Number of persistent IP OLS	(2) The proportion of persistent IP OLS	(3) The Number of New IP OLS	(4) The proportion of New IP OLS	(5) Total Number of persistent IP OLS	(6) The proportion of persistent IP OLS	(7) The Number of New IP OLS	(8) The proportion of New IP OLS
<b><u>External Comp. characteristics</u></b>								
Excess CEO pay gap	0.0219 (0.0152)	0.0040 (0.0072)	0.101 (0.104)	-0.0094 (0.017)				
<b><u>Internal Comp. characteristics</u></b>								
Log CEO pay gap					0.0231** (0.0097)	0.0035 (0.0042)	0.103* (0.0612)	-0.0181* (0.0092)
<b><u>Gov. characteristics</u></b>								
Independent directors	0.0178 (0.0579)	0.0288 (0.0318)	0.834** (0.405)	0.148** (0.066)	0.0030 (0.0423)	0.0164 (0.0165)	0.714*** (0.238)	0.0556 (0.0340)
CEO Comp committee	0.0911 (0.0803)	0.0133 (0.0325)	0.758 (0.631)	0.0061 (0.100)	0.0106 (0.0559)	-0.0092 (0.0124)	0.504 (0.497)	0.0571 (0.0686)
CEO tenure	-0.0144 (0.0252)	0.00325 (0.0110)	-0.0189 (0.127)	-0.0042 (0.0189)	-0.0136 (0.0098)	-0.0018 (0.0045)	-0.122** (0.0509)	0.0069 (0.0087)
CEO/Chairman	0.0205 (0.0561)	0.0163 (0.0281)	-0.286 (0.264)	0.0527 (0.0479)	0.0035 (0.0222)	-0.0009 (0.0102)	0.0007 (0.0973)	0.0068 (0.0210)
<b><u>Section 408 criteria</u></b>								
IC_Weak	0.0038 (0.0545)	-0.0024 (0.0237)	-0.122 (0.287)	-0.0810 (0.0555)	-0.0423 (0.0300)	-0.0145 (0.0155)	0.0174 (0.192)	0.0098 (0.0299)
Restate	0.0692* (0.0363)	0.0151 (0.0212)	-0.510* (0.307)	-0.0839* (0.0464)	0.0213 (0.0316)	0.0012 (0.0124)	-0.301 (0.278)	-0.0390 (0.0261)
High Volatility	0.0077 (0.0479)	-0.0048 (0.0244)	-0.282 (0.239)	-0.0479 (0.0475)	0.0039 (0.0349)	-0.0049 (0.0132)	-0.0308 (0.118)	0.0025 (0.0300)
Log Market value	-0.0227 (0.0444)	-0.0009 (0.0181)	-0.0664 (0.208)	-0.0763** (0.0346)	-0.0021 (0.0090)	0.0047 (0.0036)	-0.117** (0.0577)	-0.0547*** (0.0089)
Market to Book	-0.0063 (0.0228)	0.0018 (0.0115)	0.0089 (0.115)	0.0206 (0.0224)	-0.0101 (0.0065)	-0.0034 (0.0049)	-0.0228 (0.0579)	0.0235** (0.0092)

**Other company characteristics**

Firm age	0.0625*** (0.0075)	0.0622*** (0.0037)	0.0303 (0.0836)	-0.0445*** (0.0129)	-0.0067** (0.0026)	-0.0025* (0.0013)	0.0133 (0.0088)	0.0061*** (0.0019)
Loss	0.0732 (0.0531)	0.0106 (0.0245)	-0.307 (0.240)	-0.0773* (0.0444)	-0.0099 (0.0296)	0.0006 (0.0120)	-0.303*** (0.106)	-0.0188 (0.0233)
Low Market to Book	-0.0269 (0.0533)	0.0098 (0.0309)	0.684** (0.348)	-0.0088 (0.0647)	-0.0044 (0.0351)	0.0013 (0.0181)	0.318 (0.193)	-0.0414 (0.0374)
Z-score	-0.0044 (0.0065)	-0.0032 (0.0027)	-0.0088 (0.0346)	-0.0005 (0.005)	-0.0021 (0.0015)	-0.0002 (0.0009)	0.0059 (0.0212)	-0.0009 (0.0017)
Sales Growth	-0.0101 (0.0391)	-0.0016 (0.0233)	-0.163 (0.242)	0.0074 (0.0589)	0.0053 (0.0201)	-0.0006 (0.0105)	-0.145 (0.109)	0.0115 (0.0199)
M&A	0.0199 (0.0357)	0.0019 (0.0172)	0.133 (0.186)	0.0386 (0.0352)	-0.0242 (0.0172)	-0.0109 (0.0089)	-0.0034 (0.0927)	0.0082 (0.0168)
Restructuring	-0.0810* (0.0442)	-0.0067 (0.0171)	-0.426** (0.206)	-0.0414 (0.0360)	-0.0173 (0.0199)	-0.0017 (0.0096)	-0.233** (0.113)	-0.0118 (0.0200)
External Financing	-0.0214 (0.192)	0.0050 (0.0793)	-1.107 (1.046)	-0.441** (0.184)	-0.0573 (0.0995)	0.0004 (0.0565)	-0.454 (0.340)	-0.204** (0.0875)
Segments	0.0006 (0.0007)	0.0006* (0.0003)	-0.0124*** (0.0042)	-0.0010 (0.0007)	0.0002 (0.0002)	0.0001 (0.0001)	-0.0003 (0.0010)	-0.0005*** (0.0001)
Constant	-0.412 (0.330)	-0.655*** (0.140)	1.901 (2.535)	2.094*** (0.390)	-0.0160 (0.0887)	-0.0285 (0.0379)	1.126* (0.567)	1.396*** (0.0870)
Observations	2 706	2 706	2 706	2 706	2 706	2 706	2 706	2 706
Firm and year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R <sup>2</sup>	0.151	0.178	0.255	0.211	0.061	0.077	0.22	0.115
F-test	23.09***	151.14***	1.73**	2.40***	3.67***	2.15***	4.31***	14.29***

**Table 15: The change in excess CEO pay gap and in CEO pay gap**

This table examines the association between the number of compensation-related issues identified by the SEC in a firm and the change in excess CEO pay gap in the full sample. We only take into account firms for which the CEO remained in her position during the studied period. The dependent variable is the change in excess CEO pay gap from year t to t+1. The number of available observations is 19 061 firm-year observations. All independent variables are lagged by one year. Firm and year fixed effects are included. We use robust standard errors clustered at firm and year levels. See Appendix A for variable definitions.

VARIABLES	(1)Δ Excess CEO pay gap <sub>t,t+1</sub>					(1)Δ CEO pay gap <sub>t,t+1</sub>				
<u>CL characteristics</u>	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS	OLS
Compensation CL(t)	-0.0524*** (0.0171)					-0.0568*** (0.0183)				
Log Comp issue phrases(t)		-0.0489*** (0.0132)					-0.0527*** (0.0137)			
Log SEC Reg issue phrases(t)			-0.0558*** (0.0152)		-0.0541*** (0.0162)			-0.0562*** (0.0152)		-0.0514*** (0.0162)
Log Accounting issue phrases (t)				-0.0419* (0.0239)	-0.0112 (0.0256)				-0.0581** (0.0282)	-0.0292 (0.0294)
<u>External Comp characteristics</u>										
Excess CEO pay gap(t)	-0.898*** (0.0139)	-0.898*** (0.0139)	-0.899*** (0.0139)	-0.898*** (0.0139)	-0.899*** (0.0139)					
<u>Internal Comp characteristics</u>										
Log CEO pay gap(t)						-0.552*** (0.0163)	-0.552*** (0.0162)	-0.552*** (0.0162)	-0.552*** (0.0164)	-0.552*** (0.0163)
<u>Governance characteristics</u>										
Indep. directors(t)	-0.0840 (0.0546)	-0.0851 (0.0546)	-0.0858 (0.0546)	-0.0843 (0.0545)	-0.0857 (0.0546)	-0.341*** (0.0514)	-0.342*** (0.0515)	-0.342*** (0.0516)	-0.341*** (0.0513)	-0.342*** (0.0515)
CEO Comp committee	0.0392 (0.0501)	0.0389 (0.0501)	0.0393 (0.0501)	0.0383 (0.0502)	0.0391 (0.0501)	0.0093 (0.0361)	0.0089 (0.0361)	0.0089 (0.0359)	0.0082 (0.0362)	0.0087 (0.0361)
CEO tenure(t)	-0.0666*** (0.0095)	-0.0666*** (0.0095)	-0.0666*** (0.0095)	-0.0663*** (0.0095)	-0.0666*** (0.0095)	-0.0515*** (0.0136)	-0.0516*** (0.0136)	-0.0516*** (0.0135)	-0.0516*** (0.0136)	-0.0516*** (0.0136)
CEO/Chairman(t)	-0.0328 (0.0271)	-0.0331 (0.0271)	-0.0331 (0.0271)	-0.0331 (0.0271)	-0.0331 (0.0271)	-0.0125 (0.0111)	-0.0123 (0.0111)	-0.0124 (0.0111)	-0.0124 (0.0112)	-0.0123 (0.0111)
<u>Section 408 criteria</u>										
IC_Weak(t)	-0.0285 (0.0407)	-0.0272 (0.0407)	-0.0294 (0.0407)	-0.0357 (0.0406)	-0.0285 (0.0407)	-0.0419 (0.0419)	-0.0410 (0.0415)	-0.0441 (0.0415)	-0.0482 (0.0418)	-0.0420 (0.0413)
Restate(t)	0.0184 (0.0371)	0.0188 (0.0369)	0.0141 (0.0369)	0.0155 (0.0370)	0.0154 (0.0370)	0.0218 (0.0426)	0.0219 (0.0422)	0.0168 (0.0419)	0.0203 (0.0432)	0.0202 (0.0430)

High Volatility(t)	0.0098 (0.0248)	0.0104 (0.0248)	0.0105 (0.0248)	0.0091 (0.0248)	0.0105 (0.0248)	-0.0614*** (0.0208)	-0.0608*** (0.0207)	-0.0607*** (0.0207)	-0.0619*** (0.0207)	-0.0608*** (0.0206)
Log Market value(t)	-0.0761*** (0.0167)	-0.0756*** (0.0167)	-0.0755*** (0.0167)	-0.0765*** (0.0167)	-0.0755*** (0.0167)	-0.261*** (0.0114)	-0.261*** (0.0113)	-0.261*** (0.0114)	-0.261*** (0.0114)	-0.261*** (0.0114)
Market to Book(t)	0.0028 (0.0107)	0.0028 (0.0107)	0.0027 (0.0107)	0.0029 (0.0107)	0.0027 (0.0107)	0.0373*** (0.00887)	0.0372*** (0.0088)	0.0373*** (0.0088)	0.0372*** (0.0088)	0.0372*** (0.0088)
<b><u>Other company characteristics</u></b>										
Firm age(t)	0.0035 (0.0345)	0.0035 (0.0345)	0.0035 (0.0345)	0.0033 (0.0345)	0.0035 (0.0345)	-0.0001 (0.0016)	-0.0001 (0.001)	-0.0001 (0.0016)	-0.0001 (0.00169)	-0.0001 (0.0016)
Loss(t)	-0.0171 (0.0214)	-0.0171 (0.0214)	-0.0171 (0.0214)	-0.0176 (0.0214)	-0.0171 (0.0214)	-0.130*** (0.0230)	-0.130*** (0.0229)	-0.130*** (0.0230)	-0.130*** (0.0228)	-0.130*** (0.0229)
Low Market to Book(t)	-0.0397 (0.0300)	-0.0391 (0.0300)	-0.0392 (0.0300)	-0.0394 (0.0300)	-0.0391 (0.0300)	-0.101*** (0.0301)	-0.101*** (0.0302)	-0.101*** (0.0302)	-0.100*** (0.0303)	-0.100*** (0.0302)
Z-score(t)	-0.0019 (0.0025)	-0.0019 (0.0026)	-0.0019 (0.0026)	-0.0019 (0.0025)	-0.0019 (0.0026)	0.0072** (0.0028)	0.0072** (0.0028)	0.0072** (0.0028)	0.0072** (0.0028)	0.0072** (0.0028)
Sales Growth(t)	-0.0248 (0.0271)	-0.0251 (0.0271)	-0.0253 (0.0271)	-0.0248 (0.0271)	-0.0253 (0.0271)	0.155** (0.0617)	0.155** (0.0617)	0.155** (0.0617)	0.155** (0.0617)	0.155** (0.0617)
M&A(t)	-0.0317** (0.0147)	-0.0320** (0.0147)	-0.0319** (0.0147)	-0.0320** (0.0147)	-0.0319** (0.0147)	-0.0355*** (0.0104)	-0.0357*** (0.0104)	-0.0356*** (0.0104)	-0.0358*** (0.0104)	-0.0356*** (0.0104)
Restructuring(t)	0.0659*** (0.0169)	0.0663*** (0.0169)	0.0662*** (0.0169)	0.0658*** (0.0169)	0.0662*** (0.0169)	-0.0552*** (0.0154)	-0.0552*** (0.0154)	-0.0555*** (0.0153)	-0.0554*** (0.0154)	-0.0553*** (0.0154)
External Financing(t)	0.0513 (0.0795)	0.0504 (0.0792)	0.0495 (0.0792)	0.0519 (0.0796)	0.0498 (0.0792)	0.139* (0.0731)	0.138* (0.0732)	0.137* (0.0733)	0.141* (0.0728)	0.138* (0.0732)
Segments(t)	0.0001 (0.0003)	0.0001 (0.0003)	0.0001 (0.0003)	0.0001 (0.0003)	0.0001 (0.0003)	-0.0002 (0.0001)	-0.0001 (0.0001)	-0.0002 (0.0001)	-0.0002 (0.0001)	-0.0002 (0.0001)
Constant	0.712* (0.392)	0.709* (0.392)	0.709* (0.392)	0.716* (0.392)	0.709* (0.392)	-1.725*** (0.0729)	-1.727*** (0.0728)	-1.725*** (0.0728)	-1.722*** (0.0734)	-1.727*** (0.0730)
Observations	19 061	19 061	19 061	19 061	19 061	19 061	19 061	19 061	19 061	19 061
Firm and year FE	Yes	Yes	Yes	Yes	Yes					
Industry and year FE						Yes	Yes	Yes	Yes	Yes
Adjusted R <sup>2</sup>	0.422	0.422	0.422	0.422	0.422	0.275	0.275	0.275	0.275	0.275
F-test	208.40***	208.21***	208.18***	208.31***	199.08***	296.80***	302.27***	310.39***	293.99***	312.22***

\*, \*\*, \*\*\* Denote significance levels of 10 percent, 5 percent and 1 percent, respectively. Standard errors are included in parentheses.

**Table 16: CEO is the chair vs not the chair**

This table examines the association between the number of compensation-related issues identified by the SEC in a firm and the change in excess CEO compensation in the full sample. We only take into account firms for which the CEO remained in her position during the studied period. The dependent variable is the change in excess CEO compensation from year  $t$  to  $t+1$ . The number of available observations is 19,061 firm-year observations. All independent variables are lagged by one year. Firm and year fixed effects are included. We use robust standard errors clustered at firm and year levels. See Appendix A for variable definitions.

VARIABLES	(1) $\Delta$ Excess CEO Pay gap $_{t,t+1}$			(1) $\Delta$ CEO pay gap $_{t,t+1}$		
	Full Sample	CEO is Chair	CEO is Not Chair	Full Sample	CEO is Chair	CEO is Not Chair
<b><u>CL characteristics</u></b>						
Compensation CL(t)	-0.0447** (0.0174)	-0.0219 (0.0207)	-0.0680** (0.0293)	-0.0550*** (0.0172)	-0.0363* (0.0205)	-0.0717** (0.0291)
<b><u>External compensation characteristics</u></b>						
Excess CEO pay gap (t)	-0.864*** (0.0135)	-0.899*** (0.0180)	-0.951*** (0.0202)			
<b><u>Internal compensation characteristics</u></b>						
Log CEO pay gap (t)				-0.881*** (0.0141)	-0.915*** (0.0191)	-0.965*** (0.0208)
<b><u>Governance characteristics</u></b>						
Independent directors(t)	-0.0927* (0.0542)	-0.172** (0.0733)	0.0218 (0.0845)	-0.0849 (0.0550)	-0.149** (0.0736)	0.0171 (0.0865)
CEO Comp committee	0.0416 (0.0505)	0.0547 (0.0645)	-0.0057 (0.0862)	0.0210 (0.0505)	0.0507 (0.0661)	-0.0575 (0.0826)
CEO tenure(t)	-0.0779*** (0.0114)	-0.115*** (0.0171)	-0.0369** (0.0166)	-0.0825*** (0.0115)	-0.120*** (0.0173)	-0.0670*** (0.0168)
<b><u>Section 408 criteria</u></b>						
IC_Weak(t)	-0.0463 (0.0420)	0.0422 (0.0551)	-0.138** (0.0663)	-0.0247 (0.0406)	0.0590 (0.0558)	-0.120* (0.0625)
Restate(t)	0.0223 (0.0378)	-0.0303 (0.0456)	0.0847 (0.0633)	0.0120 (0.0375)	-0.0678 (0.0452)	0.103* (0.0621)
High Volatility(t)	-0.0289 (0.0252)	0.0002 (0.0340)	-0.0541 (0.0366)	0.0364 (0.0254)	0.0559 (0.0347)	0.0095 (0.0371)
Log Market value(t)	-0.244*** (0.0178)	-0.287*** (0.0266)	-0.252*** (0.0262)	-0.0578*** (0.0167)	-0.0986*** (0.0253)	-0.0527* (0.0281)
Market to Book(t)	0.0242** (0.0112)	0.0384** (0.0153)	0.0202 (0.0166)	0.0154 (0.0105)	0.0214 (0.0159)	0.0180 (0.0152)
<b><u>Other company characteristics</u></b>						
Firm age(t)	-0.0193 (0.0342)	-0.0845 (0.0602)	-0.0345 (0.0466)	-0.0066 (0.0344)	-0.0634 (0.0618)	-0.0260 (0.0472)

Loss(t)	0.0145 (0.0218)	0.0209 (0.0301)	0.0111 (0.0312)	-0.0412* (0.0213)	-0.0356 (0.0298)	-0.0438 (0.0311)
Low Market to Book(t)	-0.0541* (0.0290)	-0.0908** (0.0405)	-0.0514 (0.0421)	-0.0965*** (0.0304)	-0.122*** (0.0438)	-0.0885** (0.0430)
Z-score(t)	-0.0003 (0.0024)	-0.0002 (0.0019)	-0.0010 (0.0067)	-0.0024 (0.0026)	-0.0016 (0.0028)	-0.0027 (0.0058)
Sales Growth(t)	0.0513* (0.0272)	0.0770** (0.0387)	0.0377 (0.0318)	0.0389 (0.0240)	0.0365 (0.0364)	0.0388 (0.0281)
M&A(t)	-0.0159 (0.0148)	-0.0146 (0.0186)	-0.0243 (0.0236)	-0.0435*** (0.0148)	-0.0358* (0.0183)	-0.0537** (0.0243)
Restructuring(t)	0.0540*** (0.0172)	0.0537** (0.0215)	0.0792*** (0.0281)	0.0692*** (0.0168)	0.0751*** (0.0208)	0.0859*** (0.0278)
External Financing(t)	0.128 (0.0803)	0.151 (0.114)	0.0882 (0.127)	0.0748 (0.0783)	0.0105 (0.109)	0.0522 (0.119)
Segments(t)	0.0001 (0.0003)	0.0002 (0.0004)	-0.0009 (0.0005)	0.0002 (0.0003)	0.0001 (0.0004)	-0.0005 (0.0005)
Constant	-4.262*** (0.393)	-3.398*** (0.713)	-4.724*** (0.520)	0.827** (0.392)	1.894*** (0.717)	0.874 (0.537)
Observations	19 061	10 297	8 764	19 061	10 297	8 764
Firm and year FE	Yes	Yes	Yes			
Industry and year FE				Yes	Yes	Yes
Adjusted R <sup>2</sup>	0.415	0.431	0.455	0.422	0.437	0.458
F-test	121.02***	81.85***	71.89***	126.44***	83.74***	123.76***

\*, \*\*, \*\*\* Denote significance levels of 10 percent, 5 percent and 1 percent, respectively. Standard errors are included in parentheses.

**Table 17: The impact of receiving a CL on the probability of CEO turnover**

This table reports the results of estimating the probability of CEO turnover after the receipt of a CL using a proportional hazard model (Gietzmann et al, 2016). The dependent variable is a dummy variable that takes a value of 1 if a NEW CEO is appointed. The number of available observations is 19 824 firm year observations. All independent variables are lagged by one year. See Appendix A for variable definitions.

VARIABLES	(1) Dependent variable =1 if CEO turnover =1 <i>Proportional hazard model</i>		
<b><u>CL characteristics</u></b>	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>
Compensation CL	1.384*** (0.116)	1.229** (0.111)	1.258** (0.114)
<b><u>Governance Characteristics</u></b>			
CEO/Chairman duality	1.219*** (0.0006)	1.267*** (0.072)	1.265*** (0.072)
Excess compensation	0.765*** (0.030)		
Log CEO pay gap		0.691*** (0.018)	
Excess CEO pay gap			0.801*** (0.024)
<b><u>Firm Characteristics</u></b>			
Loss	1.367*** (0.098)	1.206** (0.095)	1.243*** (0.098)
ROA	1.745* (0.505)	1.274 (0.371)	1.481 (0.417)
Firm Size	0.966* (0.018)	1.150*** (0.026)	0.975 (0.019)
Leverage	0.584*** (0.076)	0.771* (0.103)	0.699*** (0.094)
Firm Age	0.945*** (0.003)	0.945*** (0.003)	0.945*** (0.003)
IC Weak	1.142 (0.223)	1.088 (0.226)	1.103 (0.232)
Restatement	1.308* (0.211)	1.180 (0.209)	1.163 (0.211)
M&A	0.884** (0.047)	0.872** (0.049)	0.858*** (0.048)
Sales Growth	0.848* (0.083)	0.780** (0.088)	0.683*** (0.086)
Z-score	0.986*** (0.004)	0.988** (0.004)	0.987*** (0.004)
Annual Return	0.820*** (0.043)	0.963 (0.051)	0.903* (0.050)
Number of Segments	1.002*** (0.0006)	1.002*** (0.0007)	1.002*** (0.0007)
Observations	19 824	19 824	19 824

## Appendix A: Variables Definitions

Variables	Definition
<b><u>Comment letters</u></b>	
CCL	Takes the value of 1 if a compensation comment letter was received in a given year, 0 otherwise.
CL	Takes the value of 1 if a firm received a comment letter in a given year, 0 otherwise.
<b><u>Control variables</u></b>	
<b><u>Section 408 criteria</u></b>	
High volatility	An indicator variable set equal to 1 if the volatility of abnormal monthly stock returns (equal to the monthly return [RET] minus the value weighted return [VWRD]) is in the highest quartile in a given fiscal year, and 0 otherwise. We obtain this data from CRSP ( <i>Cassel et al. 2013</i> ).
IC Weak	An indicator variable set equal to 1 if the internal control audit opinion (under SOX Section 404) or the management certification (under SOX Section 302) as reported in Audit Analytics is qualified for a material weakness in year t ( <i>Cassel et al. 2013</i> ).
Log Market cap	The natural log of market capitalization, calculated as shares outstanding at fiscal year-end (CSHO) times the share price at fiscal year-end (PRCC_F), as reported in Compustat ( <i>Cassel et al. 2013</i> ).
Restate	An indicator variable set equal to 1 if the company filed a 10-K restatement in year t, as reported in Audit Analytics ( <i>Cassel et al. 2013</i> ).
<b><u>Compensation variables</u></b>	
Total compensation	(ExecuComp data item TDC1). It includes salary, bonus, total value of restricted stock granted, total value of stock options granted (using Black-Scholes), and long-term incentive payouts in the fiscal year t-1 ( <i>Croci and Petmezas 2015</i> ).
CEO pay slice	The proportion of the top-five TMT members' compensation captured by the CEO ( <i>Bebchuk et al. 2011</i> ).
CEO pay gap	The difference between CEO compensation and the mean compensation of the next four best paid executives ( <i>Henderson and Fredrickson 2001</i> ).
TMT pay disparity	It is defined as the standard deviation of total pay of TMT members divided by the average of their total pay ( <i>Fredrickson et al., 2010; Siegel and Hambrick, 2005; Lim 2019</i> ).
Excess compensation	The excess compensation for the CEO, estimated using the residuals from a regression of log-transformed total CEO compensation (in thousands) on the economic determinants following <i>Core et al. (2008)</i> .
Excess CEO pay gap	Estimated using the residuals from a regression of log-transformed CEO pay gap on the economic determinants following <i>Core et al. (2008)</i> .
Excess CEO pay slice	Estimated using the residuals from a regression of CEO pay slice on the economic determinants following <i>Core et al. (2008)</i> .
Excess TMT pay disparity	Estimated using the residuals from a regression of TMT pay disparity on the economic determinants following <i>Core et al. (2008)</i> .



Vega	The change in the dollar value of the CEO wealth for a one percentage change in the annualized standard deviation of stock returns at the end of the fiscal year ( <i>Coles et al. 2006</i> ).
Delta	The change in the dollar value of the CEO wealth for a one percentage point change in stock price at the end of the fiscal year ( <i>Coles et al. 2006</i> ).
Excess Vega	Estimated using the residuals from a regression of Vega on the economic determinants following <i>Core et al. (2008)</i> .
Excess Delta	Estimated using the residuals from a regression of Delta on the economic determinants following <i>Core et al. (2008)</i> .
<b><u>Firm characteristics variables</u></b>	
Sales Growth	$(\text{Sales (n)} - \text{Sales (n-1)}) / \text{Sales (n-1)}$ <i>LILIENFELD-TOTAL and RUENZI (2014)</i> .
Firm Age	The age of a firm in years computed as the current year minus the year of the first appearance of the firm in the Compustat database ( <i>Heese et al. 2017</i> ).
Book-to-Market	Firm book value of equity divided by market value of equity at the fiscal year-end from COMPUSTAT ( <i>Croci and Petmezas 2015</i> ).
Market to Book	Firm's market value scaled by firm's book value, i.e., (Compustat item: CSHO * Compustat item: PRCC) / Compustat item: CEQ ( <i>Heese et al. 2017</i> ).
Low Market to Book Ratio	1 if a firm's market-to-book ratio is below 1, zero otherwise ( <i>Heese et al. 2017</i> ).
Leverage	Firm's total financial debt (Long-term debt plus debt in current liabilities) divided by the book value of total assets at the fiscal year-end from COMPUSTAT ( <i>Croci and Petmezas 2015</i> ).
Ext Financing	The sum of equity financing and debt financing scaled by total assets, measured in t+1, following Ettredge et al., (2011). Equity financing equals the sales of common and preferred stock (SSTK) minus the purchases of common and preferred stock (PRSTKC) minus dividends (DV). Debt financing equals long-term debt issued (DLTIS) minus long-term debt reduction (DLTR) minus the change in current debt (DLCCH). We obtain this data from Compustat ( <i>Heese et al. (2017), Cassel et al. (2013)</i> ).
Loss	An indicator variable set equal to 1 if earnings before extraordinary items (IB) as reported in Compustat are negative in year t and 0 otherwise ( <i>Heese et al. (2017), Cassel et al. (2013)</i> ).
M&A	An indicator variable set equal to 1 for non-zero acquisitions or mergers as reported on a pre-tax basis (AQP) in Compustat in year t and 0 otherwise ( <i>Heese et al. (2017), Cassel et al. (2013)</i> ).
Restructuring	An indicator variable set equal to 1 for non-zero restructuring costs as reported in Compustat on a pre-tax basis (RCP) in year t and 0 otherwise ( <i>Heese et al. (2017), Cassel et al. (2013)</i> ).
Z-score	Altman's Z-score is measured following Altman (1968) and is equal to $1.2 * [\text{net working capital (ACT-LCT)/total assets (AT)}] + 1.4 * [\text{retained earnings (RE)/total assets}] + 3.3 * [\text{earnings before interest and taxes (PI+XINT)/total assets}] + 0.6 * [\text{market value of equity (CSHO * PRCC\_F)/book value of liabilities (LT)}] + 1.0 * [\text{sales (SALE)/total assets}]$ . We obtain this data from Compustat ( <i>Heese et al. (2017), Cassel et al. (2013)</i> ).
Segments	The number of business segments reported in the Compustat Segments database. (C) ( <i>Cassel et al. 2013</i> )

ROA EBIT (Earnings before interest and tax) divided by total assets. (*Zhou et al. 2019*)

### **Comment Letters**

Total Length of CL Thread	The number of days between the start and the end of the conversation between the SEC and the firm.
Max Length of CL	If a firm has more than one conversation thread per year, we consider the highest duration of a conv in number of days.
Total issue phrases	The total number of unique issue phrases inside a given firm-year-thread.
Total compensation issue phrases	The total number of unique compensation issue phrases in each firm-year-thread.
Total other issue phrases	The total number of unique non-compensation issue phrases in each firm-year-thread.
Total issue phrases comp Reg	The total number of unique compensation issue phrases related to SEC regulations in each firm-year-thread.
Total issue phrases comp Acc	The total number of unique compensation issue phrases related to accounting standards in each firm-year-thread.
Max Number of letters	If a firm has more than one Conv thread per year, we consider the maximum number of letters per firm year.
Total Number of letters	The total number of letters per firm year.
Received Comp CL	Takes the value of 1 if a compensation comment letter was received in a given year, 0 otherwise.
Received Comment Letter	Takes the value of 1 if a firm received a CL in a given year, 0 otherwise.

### **Informational functions**

Methodology	The total number of issue phrases per year related to the methodology or model adopted, the measurement or estimation of fair value, the recognition of compensation cost, the Black-Scholes model and valuation techniques.
Format and Standardization	The total number of issue phrases per year related to the manner of presentation. More specifically, the omission or addition of tables, columns or lines.
Justification	The total number of issue phrases per year related to the justification of compensation policies and/or decisions made related to executive compensation.
Content	The total number of issue phrases per year related to the content of information in the tables. More specifically, information regarding compensation, employee information, financial statements, pension benefits, termination benefits and definitions.

### **Murphy categories**

All Compensation	The total number of issue phrases per year related to the whole compensation package.
Stock Awards and Stock Options	The total number of issue phrases per year related to stock awards and stock options.

Deferred Compensation The total number of issue phrases per year related to Deferred compensation.

Tax The total number of issue phrases per year related to Tax.

Pension Benefits The total number of issue phrases per year related to Pension benefits.

Termination The total number of issue phrases per year related to Termination benefits.

### **Required SEC tables**

Summary Compensation Table The total number of issue phrases per year related to summary compensation table.

Options Exercises The total number of issue phrases per year related to Options Exercises.

Grants of Plan Based Awards The total number of issue phrases per year related to the grants of plan-based awards.

Outstanding Equity Awards The total number of issue phrases per year related to outstanding equity awards.

Golden Parachute The total number of issue phrases per year related to golden parachute.

### **Accounting reports**

Share Based payments The total number of issue phrases per year related to share-based payments.

Stock Options The total number of issue phrases per year related to stock options.

### **Governance Variables**

Independent directors Percentage of independent directors. It is the ratio between the number of independent directors and the board size from RiskMetrics. This variable is set equal to 0 if the data are missing and an indicator variable for GovMissing is set equal to 1 (*Cassel et al. 2013*).

Independent directors on the comp committee Percentage of independent directors on the compensation committee.

CEO/Chairman Binary variable that takes the value of 1 if the roles of CEO and Chairman of the board are not split, 0 otherwise. The variable is created using RiskMetrics (*Cassel et al. 2013*).

CEO member of the comp committee Binary variable that takes the value of 1 if the CEO is a member of the compensation committee.

Board Size Number of directors composing board of directors from RiskMetrics (*Croci and Petmezas 2015*).

CEO tenure The number of years the CEO has served in his/her current role (*Cassel et al. 2013*).

CEO turnover Takes the value of 1 if the CEO changes in a given year (*Cheng et al. 2014*).

**CEO**  
**characteristics:**

Female Binary variable that takes the value of 1 if the CEO is female, 0 otherwise. The variable is created from the field “Gender” in ExecuComp.

CEO age Age of the CEO from ExecuComp.

## Appendix B: Issue phrases in our sample

This table reports the different issue phrases included in the sample.

Issue type	Issue Phrases	Definition	Frequency	% Total compensation issue phrases
REGUL SK	Item 402(a) and 402(m)	General	2 080	6%
	Item 402(b)(1)(i)	The objectives of the registrant's compensation programs	9	0%
	Item 402(b)(1)(ii)	What the compensation program is designed to reward	12	0%
	Item 402(b)(1)(iii)	Each element of compensation	820	3%
	Item 402(b)(1)(iv)	Why the registrant chooses to pay each element	39	0%
	Item 402(b)(1)(v)	How the registrant determines the amount (and, where applicable, the formula) for each element to pay	539	2%
	Item 402(b)(1)(vi)	How each compensation element and the registrant's decisions regarding that element fit into the registrant's overall compensation objectives and affect decisions regarding other elements	156	0%
	Item 402(b)(1)(vii)	Whether and, if so, how the registrant has considered the results of the most recent shareholder advisory vote on executive compensation required by section 14A of the Exchange Act (15 U.S.C. 78n-1) or § 240.14a-20 of this chapter in determining compensation policies and decisions and, if so, how that consideration has affected the registrant's executive compensation decisions and policies	27	0%
	Item 402(b)(2)(i)	The policies for allocating between long-term and currently paid out compensation	66	0%
	Item 402(b)(2)(ii)	The policies for allocating between cash and non-cash compensation, and among different forms of non-cash compensation	31	0%
	Item 402(b)(2)(iii)	For long-term compensation, the basis for allocating compensation to each different form of award (such as relationship of the award to the achievement of the registrant's long-term goals, management's exposure to downside equity performance risk, correlation between cost to registrant and expected benefits to the registrant)	56	0%
	Item 402(b)(2)(iv)	How the determination is made as to when awards are granted, including awards of equity-based compensation such as options	37	0%
	Item 402(b)(2)(ix)	The factors considered in decisions to increase or decrease compensation materially;	85	0%
	Item 402(b)(2)(v)	What specific items of corporate performance are considered in setting compensation policies and making compensation decisions.	1 482	5%
Item 402(b)(2)(vi)	How specific forms of compensation are structured and implemented to reflect these items of the registrant's performance, including whether discretion can be or has been exercised	2 181	7%	

		(either to award compensation absent attainment of the relevant performance goal(s) or to reduce or increase the size of any award or payout), identifying any particular exercise of discretion, and stating whether it applied to one or more specified named executive officers or to all compensation subject to the relevant performance goal(s)		
	Item 402(b)(2)(vii)	How specific forms of compensation are structured and implemented to reflect the named executive officer's individual performance and/or individual contribution to these items of the registrant's performance, describing the elements of individual performance and/or contribution that are taken into account	1 181	4%
	Item 402(b)(2)(viii)	Registrant policies and decisions regarding the adjustment or recovery of awards or payments if the relevant registrant performance measures upon which they are based are restated or otherwise adjusted in a manner that would reduce the size of an award or payment	22	0%
	Item 402(b)(2)(x)	How compensation or amounts realizable from prior compensation are considered in setting other elements of compensation (e.g., how gains from prior option or stock awards are considered in setting retirement benefits)	25	0%
<b>REGUL SK</b>	Item 402(b)(2)(xi)	With respect to any contract, agreement, plan or arrangement, whether written or unwritten, that provides for payment(s) at, following, or in connection with any termination or change-in-control, the basis for selecting particular events as triggering payment (e.g., the rationale for providing a single trigger for payment in the event of a change-in-control)	32	0%
	Item 402(b)(2)(xii)	The impact of the accounting and tax treatments of the particular form of compensation	6	0%
	Item 402(b)(2)(xiii)	The registrant's equity or other security ownership requirements or guidelines (specifying applicable amounts and forms of ownership), and any registrant policies regarding hedging the economic risk of such ownership	2	0%
	Item 402(b)(2)(xiv)	Whether the registrant engaged in any benchmarking of total compensation, or any material element of compensation, identifying the benchmark and, if applicable, its components (including component companies)	1 707	5%
	Item 402(b)(2)(xv)	The role of executive officers in determining executive compensation	1 331	4%
	Item 402(b), Instruction 1	The purpose of the Compensation Discussion and Analysis is to provide to investors material information that is necessary to an understanding of the registrant's compensation policies and	9	0%

		decisions regarding the named executive officers		
	Item 402(b), Instruction 2	The Compensation Discussion and Analysis should be of the information contained in the tables and otherwise disclosed pursuant to this Item. The Compensation Discussion and Analysis should also cover actions regarding executive compensation that were taken after the registrant's last fiscal year's end	83	0%
	Item 402(b), Instruction 3	The Compensation Discussion and Analysis should focus on the material principles underlying the registrant's executive compensation policies and decisions and the most important factors relevant to analysis of those policies and decisions	14	0%
	Item 402(b), Instruction 4	Registrants are not required to disclose target levels with respect to specific quantitative or qualitative performance-related factors considered by the compensation committee or the board of directors, or any other factors or criteria involving confidential trade secrets or confidential commercial or financial information, the disclosure of which would result in competitive harm for the registrant	1820	6%
	Item 402(c) and 402(n)	Summary compensation table	1 774	5%
	Item 402(d)	Grants of plan-based awards table	1 385	4%
	Item 402(e) and 402(o)	Narrative disclosure to summary compensation table and grants of plan-based awards table.	1 406	4%
	Item 402(f) and 402(p)	Outstanding equity awards at fiscal year-end table	487	2%
	Item 402(g)	Option exercises and stock vested table	1 475	5%
	Item 402(h)	Pension Benefits	453	1%
	Item 402(i)	Nonqualified defined contribution and other nonqualified deferred compensation plans	325	1%
	Item 402(j)	Potential payments upon termination or change-in-control	859	3%
	Item 402(l)	Smaller reporting companies and emerging growth companies	4	0%
	Item 402(q)	Smaller reporting companies - Additional narrative disclosure	24	0%
	Item 402(s)	Narrative disclosure of the registrant's compensation policies and practices as they relate to the registrant's risk management	912	3%
	Item 402(t)	Golden parachute compensation	57	0%
	Item 403(b)	Security ownership of management	98	0%
	Item 702	Indemnification of directors and officers	46	0%
<b>TOTAL</b>			<b>23 157</b>	<b>71%</b>
<b>SFAS GAAP</b>	SFAS 123(R), paragraph 28-38	Awards Classified as Liabilities	39	0%
<b>SFAS GAAP</b>	SFAS 123(R), paragraph 43-45	Amount of Compensation Cost to Be Recognized over the Requisite Service Period	7	0%
	SFAS 123(R), paragraph 47-49	Recognition and Measurement of Compensation Cost	12	0%
	SFAS 123(R), paragraph 58-63	Accounting for Tax Effects of Share-Based Compensation Awards	3	0%

SFAS 123(R), paragraph 64-65	Disclosures related to the effect of compensation cost arising from share-based payment arrangements on the income statement, the method of estimating the fair value of the goods	49	0%
SFAS 123(R), paragraph 69-84	As of the required effective date, all public entities and those nonpublic entities that used the fair-value-based method for either recognition or disclosure under Statement 123 shall apply the modified prospective application transition method	96	0%
SFAS 123(R), paragraph A134-A148	Share-Based Equity and Liability Awards Granted by a Nonpublic Entity	3	0%
SFAS 123(R), paragraph A149-A159	Modification of Vested Share Options	2	0%
SFAS 123(R), paragraph A23-A24	Consistent Use of Valuation Techniques and Methods for Selecting Assumptions	2	0%
SFAS 123(R), paragraph A26-A30	Expected Term of Employee Share Options and Similar Instruments	10	0%
SFAS 123(R), paragraph A31-A34	Expected Volatility	16	0%
SFAS 123(R), paragraph A35-A37	Option-pricing models generally call for expected dividend yield as an assumption. However, the models may be modified to use an expected dividend amount rather than a yield. An entity may use either its expected yield or its expected payments. Additionally, an entity's historical pattern of dividend increases (or decreases) should be considered. For example, if an entity has historically increased dividends by approximately 3 percent per year, its estimated share option value should not be based on a fixed dividend amount throughout the share option's expected term.	4	0%
SFAS 123(R), paragraph A43-A48	Illustrative Computations and Other Guidance	6	0%
SFAS 123(R), paragraph A7-A9	Fair Value of Instruments Granted in a Share-Based Payment Transaction Fair value is defined in FASB Concepts Statement No. 7, Using Cash Flow Information and Present Value in Accounting Measurements, as follows: The amount at which that asset (or liability) could be bought (or incurred) or sold (or settled) in a current transaction between willing parties, that is, other than in a forced or liquidation sale. (Concepts Statement 7, Glossary of Terms)	1	0%
SFAS 123(R), paragraph A79-A85	Service Inception Date and Grant Date	2	0%
SFAS 123(R), paragraph A86-A104	Accounting for Share Options with Service Conditions	14	0%
SFAS 123(R), paragraph(s) 16-27	Measurement of Awards Classified as Equity	18	0%
SFAS 123(R), paragraph(s) 39-42	Recognition of Compensation Cost over the Requisite Service Period	14	0%



	SFAS 123(R), paragraph(s) 4-6	Recognition Principle for Share-Based Payment Transactions	4	0%
	SFAS 123(R), paragraph(s) A18-22	Selecting Assumptions for Use in an Option-Pricing Model	26	0%
	SFAS 123, Appendix E	Glossary and Definitions	4	0%
	SFAS 123, Appendix F	Calculating Historical Volatility	3	0%
	SFAS 123, paragraph 6	This Statement applies to all transactions in which an entity acquires goods or services by issuing equity instruments or by incurring liabilities to the supplier in amounts based on the price of the entity's common stock or other equity instruments. Therefore, it applies to all transactions in which an entity grants shares of its common stock, stock options, or other equity instruments to its employees, except for equity instruments held by an employee stock ownership plan	3	0%
SFAS GAAP	SFAS 123, paragraph 7	The accounting for all stock-based compensation arrangements with employees or others shall reflect the inherent rights and obligations, regardless of how those arrangements are described. For example, the rights and obligations embodied in a transfer of stock to an employee for consideration of a nonrecourse note are substantially the same as if the transaction were structured as the grant of a stock option, and the transaction shall be accounted for as such.	5	0%
	SFAS 123, paragraph(s) 11-15	Accounting for Transactions with Employees	3	0%
	SFAS 123, paragraph(s) 135-148	Measurement Method for Compensation Cost	1	0%
	SFAS 123, paragraph(s) 149-173	Conclusions on Measurement Date and Method	1	0%
	SFAS 123, paragraph(s) 16-25	Valuation of Equity Instruments Issued for Employee Services	31	0%
	SFAS 123, paragraph(s) 174-181	An emerging entity whose stock is not yet publicly traded may offer stock options to its employees. In concept, those options also should be measured at fair value at the grant date. However, the Board recognizes that estimating expected volatility for the stock of a newly formed entity that is rarely traded, even privately, is not feasible. The Board therefore decided to permit a nonpublic entity to omit expected volatility in determining a value for its options. The result is that a nonpublic entity may use the minimum value method discussed and illustrated in paragraphs 139-142. Options granted after an entity qualifies as a public entity must be measured using the procedures specified for public entities. Paragraphs 273-287 in Appendix B	1	0%

		provide guidance on how to determine the assumptions required by option-pricing models, including expected volatility for a publicly traded stock that has little, if any, trading history.		
	SFAS 123, paragraph(s) 26-33	Recognition of Compensation Cost	11	0%
	SFAS 123, paragraph(s) 45-48	Disclosures related to the number and weighted-average exercise prices of options	159	0%
	SFAS 123R, A99-A102	Graded Vesting Attribution Method The value of the share options that vest over the three-year period is estimated by separating the total award into three groups (or tranches) according to the year in which they vest (because the expected life for each tranche differs).	1	0%
	SFAS 123R, Appendix A	This appendix is an integral part of this Statement and provides implementation guidance that illustrates the fair-value-based method of accounting for share-based compensation arrangements with employees.	6	0%
	SFAS 123R, Appendix B	Appendix B: Basis for Conclusions	1	0%
	SFAS 123R, Appendix E	Appendix E: Glossary and Definitions	5	0%
	SFAS 123R, Appendix F	Calculating Historical Volatility	1	0%
	SFAS 123R, B93	Guidance on Estimating Fair Value	3	0%
	SFAS 123R, paragraph 11	Share-based payments awarded to an employee of the reporting entity by a related party or other holder of an economic interest in the entity as compensation for services provided to the entity are share-based payment transactions to be accounted for under this Statement unless the transfer is clearly for a purpose other than compensation for services to the reporting entity.	2	0%
	SFAS 123R, paragraph A240a	A description of the share-based payment arrangement(s), including the general terms of awards under the arrangement(s), such as the requisite service period(s) and any other substantive conditions (including those related to vesting), the maximum contractual term of equity (or liability) share options or similar instruments, and the number of shares authorized for awards of equity share options or other equity instruments. An entity shall disclose the method it uses for measuring compensation cost from share-based payment arrangements with employees.	331	1%
<b>SFAS GAAP</b>	SFAS 123R, paragraph A240b	For the most recent year for which an income statement is provided: (1) The number and weighted-average exercise prices (or conversion ratios) for each of the following groups of share options (or share units): (a) those outstanding at the beginning of the	20	0%

		<p>year, (b) those outstanding at the end of the year, (c) those exercisable or convertible at the end of the year, and those (d) granted, (e) exercised or converted, (f) forfeited, or (g) expired during the year.</p> <p>(2) The number and weighted-average grant-date fair value (or calculated value for a nonpublic entity that uses that method or intrinsic value for awards measured pursuant to paragraphs 24 and 25 of this Statement) of equity instruments not specified in paragraph A240(b)(1) (for example, shares of nonvested stock), for each of the following groups of equity instruments: (a) those nonvested at the beginning of the year, (b) those nonvested at the end of the year, and those (c) granted, (d) vested, or (e) forfeited during the year.</p>		
	SFAS 123R, paragraph A240c	<p>For each year for which an income statement is provided:</p> <p>(1) The weighted-average grant-date fair value (or calculated value for a nonpublic entity that uses that method or intrinsic value for awards measured at that value pursuant to paragraphs 24 and 25 of this Statement) of equity options or other equity instruments granted during the year.</p> <p>(2) The total intrinsic value of options exercised (or share units converted), share-based liabilities paid, and the total fair value of shares vested during the year.</p>	433	1%
	SFAS 123R, paragraph A240d	<p>For fully vested share options (or share units) and share options expected to vest at the date of the latest statement of financial position:</p> <p>(1) The number, weighted-average exercise price (or conversion ratio), aggregate intrinsic value, and weighted-average remaining contractual term of options (or share units) outstanding.</p> <p>(2) The number, weighted-average exercise price (or conversion ratio), aggregate intrinsic value (except for nonpublic entities), and weighted-average remaining contractual term of options (or share units) currently exercisable (or convertible).</p>	70	0%
	SFAS 123R, paragraph A240e	<p>For each year for which an income statement is presented:<sup>137</sup></p> <p>(1) A description of the method used during the year to estimate the fair value (or calculated value) of awards under share-based payment arrangements.</p> <p>(2) A description of the significant assumptions used during the year to estimate the fair value (or calculated</p>	3 780	12%

		value) of share-based compensation awards		
	SFAS 123R, paragraph A240f	An entity that grants equity or liability instruments under multiple share-based payment arrangements with employees shall provide the information specified in paragraphs A240(a)–(e) separately for different types of awards to the extent that the differences in the characteristics of the awards make separate disclosure important to an understanding of the entity’s use of share-based compensation. For example, separate disclosure of weighted-average exercise prices (or conversion ratios) at the end of the year for options (or share units) with a fixed exercise price (or conversion ratio) and those with an indexed exercise price (or conversion ratio) could be important. It also could be important to segregate the number of options (or share units) not yet exercisable into those that will become exercisable (or convertible) based solely on fulfilling a service condition and those for which a performance condition must be met for the options (share units) to become exercisable (convertible). It could be equally important to provide separate disclosures for awards that are classified as equity and those classified as liabilities.	8	0%
<b>SFAS GAAP</b>	SFAS 123R, paragraph A240g	For each year for which an income statement is presented: (1) Total compensation cost for share-based payment arrangements (a) recognized in income as well as the total recognized tax benefit related thereto and (b) the total compensation cost capitalized as part of the cost of an asset. (2) A description of significant modifications, including the terms of the modifications, the number of employees affected, and the total incremental compensation cost resulting from the modifications.	1 159	4%
	SFAS 123R, paragraph A240h	As of the latest balance sheet date presented, the total compensation cost related to nonvested awards not yet recognized and the weighted-average period over which it is expected to be recognized.	26	0%
	SFAS 123R, paragraph A240i	If not separately disclosed elsewhere, the amount of cash received from exercise of share options and similar instruments granted under share-based payment arrangements and the tax benefit realized from stock options exercised during the annual period.	2	0%
	SFAS 123R, paragraph A240k	A description of the entity’s policy, if any, for issuing shares upon share option exercise (or share unit conversion), including the source of those shares (that is, new shares or treasury shares). If as a result of its policy, an entity expects to repurchase shares in the following annual period, the entity shall disclose an estimate of	14	0%

		the amount (or a range, if more appropriate) of shares to be repurchased during that period.		
	SFAS 132	Employers' Disclosures about Pensions and Other Postretirement Benefits—an amendment of FASB Statements No. 87, 88, and 106	530	2%
	SFAS 132(R)	Employers' Disclosures about Pensions and Other Postretirement Benefits—an amendment of FASB Statements No. 87, 88, and 106	80	0%
	SFAS 148	Accounting for Stock-Based Compensation—Transition and Disclosure—an amendment of FASB Statement No. 123	92	0%
	SFAS 87	Employers' Accounting for Pensions	634	2%
<b>TOTAL</b>			<b>7 748</b>	<b>24%</b>
<b>SAB GUIDANCE</b>	SAB Topic 14:D	Certain Assumptions Used in Valuation Methods	842	3%
	SAB Topic 14: F	Classification of Compensation Expense Associated with Share-Based Payment Arrangements	145	0%
	SAB 107	the interaction between Statement of Financial Accounting Standards Statement No. 123 (revised 2004), Share-Based Payment and certain Securities and Exchange Commission rules and regulations and provides the staff's views regarding the valuation of share-based payment arrangements for public companies.	113	0%
	SAB 110	This staff accounting bulletin ("SAB") expresses the views of the staff regarding the use of a "simplified" method, as discussed in SAB No. 107 ("SAB 107"), in developing an estimate of expected term of "plain vanilla" share options in accordance with Statement of Financial Accounting Standards No. 123 (revised 2004), Share-Based Payment.	15	0%
	SAB Topic 14: G	Non-GAAP Financial Measures	7	0%
	SAB Topic 14: E	FASB ASC Topic 718, Compensation — Stock Compensation, and Certain Redeemable Financial Instruments	3	0%
	<b>SAB GUIDANCE</b>	SAB Topic 14:C	Valuation Methods	2
SAB Topic 14: A		Guidance for companies as to how they should recognize and disclose the cost of providing "spring-loaded" awards to executives	1	0%
SAB Topic 14: I		Capitalization of Compensation Cost Related to Share-Based Payment Arrangements	1	0%
<b>TOTAL</b>			<b>1 129</b>	<b>3%</b>
<b>ACCOUNTING</b>	APB Opinion No. 25 issues	Accounting for stock issued to employees	131	0%
<b>TOTAL</b>			<b>131</b>	<b>0%</b>
<b>EXCHANGE</b>	Exchange Act Rule 14a-21 issues	Shareholder approval of executive compensation, frequency of votes for approval of executive compensation and shareholder approval of golden parachute compensation	85	0%
<b>TOTAL</b>			<b>85</b>	<b>0%</b>
<b>SEC RELEASES</b>	SEC Release No. 33-7009	Executive Compensation Disclosure; Securityholder List and Mailing Requests	18	0%

	SEC Release No. 33-8765	Option Disclosure Requirements	17	0%
	SEC Release No. 34-32723	Executive Compensation Disclosure; Securityholder List and Mailing Requests.	10	0%
	SEC Release No. 33-9178	Shareholder approval of executive compensation and golden parachute compensation	9	0%
	SEC Release No. 33-8568	Amendment to rule 4-01(a) of regulation S-X regarding the compliance date for statement of financial accounting standards no. 123 (revised 2004) share-based payment	3	0%
	SEC Release No. 34-45189	Disclosure of Equity Compensation Plan Information	2	0%
	SEC Release No. 34-55009	Stock option reporting	1	0%
	SEC Release No. 34-56010	Exemption of Compensatory Employee Stock Options From Registration Under Section 12(g) of the Securities Exchange Act of 1934	1	0%
<b>TOTAL</b>			<b>61</b>	<b>0%</b>
<b>EITF GAAP</b>	EITF 00-23	Issues Related to the Accounting for Stock Compensation under APB Opinion No. 25 and FASB Interpretation No. 44	45	0%
	EITF 04-12	Determining Whether Equity-Based Compensation Awards Are Participating Securities	4	0%
	EITF 84-18	Stock Option pyramiding	1	0%
	EITF 95-16	Accounting for Stock Compensation Arrangements with Employer Loan Features under APB Opinion No. 25	1	0%
<b>TOTAL</b>			<b>51</b>	<b>0%</b>
<b>REGUL MAR</b>	Item 1009	Persons/assets, retained, employed, compensated or used.	18	0%
<b>TOTAL</b>			<b>18</b>	<b>0%</b>
<b>FIN GUIDANCE</b>	FIN 28 issues	Accounting for Stock Appreciation Rights and Other Variable Stock Option or Award Plans	10	0%
	FIN 38 issues	Effective Date: For grants made to employees on or after March14,1984, under stock option, purchase, and award plans involving junior stock	1	0%
<b>TOTAL</b>			<b>11</b>	<b>0%</b>
<b>FASBACCO</b>	ASU No. 2016-09	Improvements to Employee Share-Based Payment Accounting	9	0%
<b>TOTAL</b>			<b>9</b>	<b>0%</b>
<b>FSP GUIDANCE</b>	FSP FAS 123(R)-3 issues	Transition Election Related to Accounting for the Tax Effects of Share based payment Awards	2	0%
	FSP FAS 123(R)-4 issues	Classification of Options and Similar Instruments Issued as Employee Compensation that Allow for Cash Settlement upon the Occurrence of a Contingent Event	2	0%
<b>FSP GUIDANCE</b>	FSP FAS 123(R)-6 issues	Technical Corrections of FASB Statement No. 123(r)	1	0%
<b>TOTAL</b>			<b>5</b>	<b>0%</b>

## Appendix C: Top 10 Accounting standards

Number	Issue phrase	Topic	Frequency	% of Total Accounting (9 078)	% of total Compensation issue phrases (32 399)
1	SFAS 123R, paragraph A240e	For each year for which an income statement is presented:137 (1) A description of the method used during the year to estimate the fair value (or calculated value) of awards under share-based payment arrangements. (2) A description of the significant assumptions used during the year to estimate the fair value (or calculated value) of share-based compensation awards	3 780	41%	12
2	SFAS 123R, paragraph A240g	For each year for which an income statement is presented: (1) Total compensation cost for share-based payment arrangements (a) recognized in income as well as the total recognized tax benefit related thereto and (b) the total compensation cost capitalized as part of the cost of an asset. (2) A description of significant modifications, including the terms of the modifications, the number of employees affected, and the total incremental compensation cost resulting from the modifications.	1 159	13%	4%
3	SAB Topic 14:D	Certain Assumptions Used in Valuation Methods	842	9%	3%
4	SFAS 87	Employers' Accounting for Pensions	634	7%	2%
5	SFAS 132	Employers' Disclosures about Pensions and Other Postretirement Benefits—an amendment of FASB Statements No. 87, 88, and 106	530	6%	2%
6	SFAS 123R, paragraph A240c	For each year for which an income statement is provided: (1) The weighted-average grant-date fair value (or calculated value for a nonpublic entity that uses that method or intrinsic value for awards measured at that value pursuant to paragraphs 24 and 25 of this Statement) of equity options or other equity instruments granted during the year. (2) The total intrinsic value of options exercised (or share units converted), share-based liabilities paid, and the total fair value of shares vested during the year.	433	5%	1%
7	SFAS 123R, paragraph A240a	A description of the share-based payment arrangement(s), including the general terms of awards under the arrangement(s), such as the requisite service period(s) and any other substantive conditions (including those related to vesting), the maximum contractual term of equity (or liability) share options or similar instruments, and the number of shares authorized for awards of equity share options or other equity instruments. An entity shall disclose the method it uses for measuring compensation cost from share-based payment arrangements with employees.	331	4%	1%
8	SFAS 123, paragraph(s) 45-48	Disclosures related to the number and weighted-average exercise prices of options	159	2%	0.5%
9	SAB Topic 14: F	Classification of Compensation Expense Associated with Share-Based Payment Arrangements	145	2%	0.5%
10	APB Opinion No. 25 issues	Accounting for stock issued to employees	131	1%	0.5%

## Top 10 Regulatory issues

Number	Issue phrase	Topic	Frequency	% of Total Regulatory (23 321)	% of total Compensation issue phrases (32 399)
1	Item 402(b)(2)(vi)	How specific forms of compensation are structured and implemented to reflect these items of the registrant's performance, including whether discretion can be or has been exercised (either to award compensation absent attainment of the relevant performance goal(s) or to reduce or increase the size of any award or payout), identifying any particular exercise of discretion, and stating whether it applied to one or more specified named executive officers or to all compensation subject to the relevant performance goal(s)	2 181	9%	7%
2	Item 402(a) and 402(m)	General (All compensation covered)	2 080	9%	6%
3	Item 402(b), Instruction 4	Registrants are not required to disclose target levels with respect to specific quantitative or qualitative performance-related factors considered by the compensation committee or the board of directors, or any other factors or criteria involving confidential trade secrets or confidential commercial or financial information, the disclosure of which would result in competitive harm for the registrant	1 820	8%	6%
4	Item 402(c) and 402(n)	Summary compensation table	1 774	8%	5%
5	Item 402(b)(2)(xiv)	Whether the registrant engaged in any benchmarking of total compensation, or any material element of compensation, identifying the benchmark and, if applicable, its components (including component companies)	1 707	7%	5%
6	Item 402(b)(2)(v)	What specific items of corporate performance are considered in setting compensation policies and making compensation decisions.	1 482	6%	5%
7	Item 402(g)	Option exercises and stock vested table	1 475	6%	5%
8	Item 402(e) and 402(o)	Narrative disclosure to summary compensation table and grants of plan-based awards table.	1 406	6%	4%
9	Item 402(d)	Grants of plan-based awards table	1 385	6%	4%
10	Item 402(b)(2)(xv)	The role of executive officers in determining executive compensation	1 331	6%	4%



### Appendix D1: Regression results for the estimation of excess compensation

This table reports the results of estimating the OLS regression of the logarithms of CEO total compensation against economic determinants of CEO total compensation. The number of available observations is 29 995 firm-year observations for the period 2004-2020. Excess compensation is measured by the residuals from this regression. Robust standard errors are used to obtain unbiased standard errors of coefficients. Industry and year fixed effects are included. See Appendix A for variable definitions.

VARIABLES	Dependent variable=1 if a firm received a compensation comment letter OLS
Log CEO tenure <sub>t-1</sub>	0.037*** (0.011)
S&P 500 <sub>t</sub>	-0.030 (0.026)
Log Sales <sub>t-1</sub>	0.431*** (0.011)
Book to Market <sub>t-1</sub>	-0.143*** (0.025)
Return <sub>t-1</sub>	0.062*** (0.013)
Return <sub>t-1</sub>	0.087*** (0.012)
ROA <sub>t</sub>	0.305* (0.154)
ROA <sub>t-1</sub>	-0.490 (0.150)
Constant	4.953*** (0.109)
Observations	29 995
Industry and year FE	Yes
Adjusted R <sup>2</sup>	0.408
F-test	135.74

\*, \*\*, \*\*\* Denote significance levels of 10 percent, 5 percent and 1 percent, respectively. Standard errors are included in parentheses.

## Appendix D2: Determinants of receipt of a compensation Comment Letter

This table reports the results of estimating the likelihood of receiving a compensation comment letter. The dependent variable is a dummy variable that takes the value of 1 if a firm received a CL related to executive compensation, 0 if the firm did NOT receive a comment letter. The number of available observations is 21 820 firm-year observations. All independent variables are lagged by one year. Firm and year fixed effects are included. We use robust standard errors clustered at firm and year levels. See Appendix A for variable definitions.

VARIABLES	Dependent variable=1 if a firm received a compensation comment letter						
	(1) Logit	(2) Logit	(3) Logit	(4) Logit	(5) Logit	(6) Logit	(7) Logit
<b><u>External Comp characteristics</u></b>							
Excess CEO pay gap	0.120*** (0.0411)						
Excess CEO pay slice		0.674** (0.339)					
Excess TMT pay disparity			0.424*** (0.151)				
Excess compensation				0.240*** (0.0637)			
<b><u>Internal Comp characteristics</u></b>							
Log CEO pay gap					0.103*** (0.0400)		
CEO pay slice						0.616* (0.335)	
TMT pay disparity							0.418*** (0.150)
<b><u>Governance characteristics</u></b>							
Independent directors	0.215 (0.149)	0.215 (0.149)	0.223 (0.149)	0.216 (0.149)	0.211 (0.149)	0.216 (0.149)	0.220 (0.149)
CEO Comp committee	-0.169 (0.246)	-0.167 (0.246)	-0.164 (0.246)	-0.165 (0.246)	-0.166 (0.246)	-0.167 (0.246)	-0.161 (0.245)
CEO tenure	0.0146 (0.0445)	0.0143 (0.0445)	0.0205 (0.0443)	0.0166 (0.0445)	0.0089 (0.0446)	0.0063 (0.0450)	0.0181 (0.0443)
CEO/Chairman	0.0366 (0.124)	0.0345 (0.124)	0.0364 (0.124)	0.0413 (0.124)	0.0357 (0.124)	0.0344 (0.124)	0.0361 (0.124)
<b><u>Section 408 criteria</u></b>							
IC_Weak	20.07 (1,113)	20.08 (1,118)	20.06 (1,111)	20.07 (1,108)	20.08 (1,121)	20.08 (1,118)	20.07 (1,113)
Restate	20.48	20.49	20.48	20.47	20.48	20.49	20.48

	(1,042)	(1,044)	(1,030)	(1,039)	(1,046)	(1,044)	(1,031)
High Volatility	-0.0391 (0.102)	-0.0361 (0.102)	-0.0346 (0.102)	-0.0387 (0.102)	-0.0403 (0.102)	-0.0369 (0.102)	-0.0369 (0.102)
Log Market value	0.0456 (0.0787)	0.0583 (0.0786)	0.0560 (0.0786)	0.0338 (0.0788)	0.0299 (0.0793)	0.0572 (0.0786)	0.0516 (0.0786)
Market to Book	0.0109 (0.0467)	0.0116 (0.0467)	0.0101 (0.0467)	0.0107 (0.0467)	0.0120 (0.0465)	0.0109 (0.0467)	0.0100 (0.0467)
<b><u>Other company characteristics</u></b>							
Firm age	-0.292 (1.348)	-0.287 (1.349)	-0.286 (1.348)	-0.290 (1.347)	-0.294 (1.345)	-0.285 (1.349)	-0.287 (1.347)
Loss	-0.0048 (0.0997)	-0.0061 (0.0997)	-0.0018 (0.0997)	-0.0057 (0.0997)	-0.0022 (0.0997)	-0.0048 (0.0997)	-0.0030 (0.0997)
Low Market to Book	-0.0015 (0.128)	-0.0001 (0.128)	-0.0040 (0.128)	-0.0016 (0.128)	-0.0029 (0.128)	0.0019 (0.128)	-0.0008 (0.128)
Z-score	0.0061 (0.0129)	0.0067 (0.0130)	0.0065 (0.0130)	0.0057 (0.0129)	0.0066 (0.0129)	0.0067 (0.0130)	0.00674 (0.0130)
Sales Growth	0.0501 (0.108)	0.0753 (0.106)	0.0720 (0.107)	0.0321 (0.109)	0.0642 (0.107)	0.0740 (0.106)	0.0732 (0.106)
M&A	0.0177 (0.0734)	0.0211 (0.0734)	0.0204 (0.0734)	0.0131 (0.0734)	0.0209 (0.0734)	0.0219 (0.0734)	0.0208 (0.0734)
Restructuring	0.160** (0.0813)	0.161** (0.0812)	0.163** (0.0812)	0.162** (0.0813)	0.158* (0.0812)	0.161** (0.0812)	0.163** (0.0812)
External Financing	-0.255 (0.358)	-0.248 (0.357)	-0.254 (0.358)	-0.260 (0.358)	-0.250 (0.357)	-0.249 (0.357)	-0.246 (0.358)
Segments	-0.0011 (0.0016)	-0.0012 (0.0016)	-0.0012 (0.0016)	-0.0012 (0.0016)	-0.0012 (0.0016)	-0.0012 (0.0016)	-0.0012 (0.0016)
Observations	16 080	16 080	16 080	16 080	16 080	16 080	16 080
Firm and year FE	Yes	Yes	Yes	Yes			
Industry and year FE					Yes	Yes	Yes
Pseudo-R <sup>2</sup>	0.349	0.349	0.349	0.350	0.349	0.349	0.349
Chi <sup>2</sup>	3137.12***	3132.48***	3136.80***	3142.84***	3 135.26***	3 131.90***	3 136.24***

\*, \*\*, \*\*\* Denote significance levels of 10 percent, 5 percent and 1 percent, respectively. Standard errors are included in parentheses.

### Appendix D3: Determinants of receipt of a compensation Comment Letter using (excess) delta and (excess) vega

This table reports the results of estimating the likelihood of receiving a compensation comment letter. The dependent variable is a dummy variable that takes the value of 1 if a firm received a CL related to executive compensation, 0 if the firm received a comment letter related to another topic. The number of available observations is 21 820 firm-year observations. All independent variables are lagged by one year. Firm, Industry and year fixed effects are included. We use robust standard errors clustered at firm and year levels. See Appendix A for variable definitions.

VARIABLES	Dependent variable=1 if a firm received a compensation comment letter					
<u>CEOs incentives measures</u>	(1) Logit	(2) Logit	(3) Logit	(4) Logit	(5) Logit	(6) Logit
Vega	-1.263 (1.187)		-1.238 (1.207)			
Delta		-0.0327 (0.106)	-0.0122 (0.106)			
<u>CEOs incentives measures</u>						
Excess Vega				-1.523 (1.214)		-1.458 (1.234)
Excess Delta					-0.0593 (0.114)	-0.0350 (0.114)
<u>Governance characteristics</u>						
Independent directors	0.114 (0.129)	0.113 (0.129)	0.114 (0.129)	0.113 (0.129)	0.113 (0.129)	0.113 (0.129)
CEO Comp committee	-0.156 (0.203)	-0.155 (0.203)	-0.156 (0.203)	-0.156 (0.203)	-0.156 (0.203)	-0.156 (0.203)
CEO tenure	0.0465 (0.0391)	0.0407 (0.0388)	0.0468 (0.0392)	0.0410 (0.0385)	0.0333 (0.0403)	0.0373 (0.0403)
CEO/Chairman	0.0243 (0.107)	0.0269 (0.107)	0.0249 (0.107)	0.0243 (0.107)	0.0282 (0.107)	0.0260 (0.107)
<u>Section 408 criteria</u>						
IC_Weak	1.284*** (0.134)	1.283*** (0.134)	1.285*** (0.134)	1.285*** (0.134)	1.283*** (0.134)	1.285*** (0.134)
Restate	1.054*** (0.115)	1.053*** (0.115)	1.054*** (0.115)	1.055*** (0.115)	1.053*** (0.115)	1.054*** (0.115)
High Volatility	0.0427 (0.0905)	0.0463 (0.0905)	0.0429 (0.0906)	0.0427 (0.0905)	0.0466 (0.0905)	0.0432 (0.0905)
Log Market value	0.0416 (0.0680)	0.0377 (0.0679)	0.0416 (0.0680)	0.0406 (0.0679)	0.0373 (0.0679)	0.0403 (0.0679)

Market to Book	0.0016 (0.0432)	0.0047 (0.0433)	0.0021 (0.0434)	0.0020 (0.0431)	0.0053 (0.0433)	0.0032 (0.0433)
<b><u>Other company characteristics</u></b>						
Firm age	-0.459 (1.244)	-0.464 (1.245)	-0.459 (1.244)	-0.459 (1.243)	-0.463 (1.244)	-0.459 (1.243)
Loss	-0.0169 (0.0854)	-0.0188 (0.0854)	-0.0169 (0.0854)	-0.0169 (0.0854)	-0.0179 (0.0854)	-0.0164 (0.0854)
Low Market to Book	-0.0809 (0.111)	-0.0790 (0.111)	-0.0811 (0.111)	-0.0830 (0.111)	-0.0791 (0.111)	-0.0833 (0.111)
Z-score	0.0055 (0.0112)	0.0056 (0.0112)	0.0055 (0.0112)	0.0055 (0.0112)	0.0056 (0.0112)	0.0055 (0.0112)
Sales Growth	-0.0217 (0.0831)	-0.0202 (0.0829)	-0.0218 (0.0831)	-0.0191 (0.0829)	-0.0200 (0.0829)	-0.0193 (0.0830)
M&A	-0.0293 (0.0646)	-0.0281 (0.0646)	-0.0291 (0.0646)	-0.0299 (0.0646)	-0.0280 (0.0646)	-0.0296 (0.0646)
Restructuring	0.0975 (0.0713)	0.0966 (0.0713)	0.0975 (0.0713)	0.0977 (0.0713)	0.0966 (0.0713)	0.0977 (0.0713)
External Financing	-0.128 (0.313)	-0.119 (0.313)	-0.128 (0.313)	-0.129 (0.313)	-0.117 (0.313)	-0.126 (0.313)
Segments	-0.0005 (0.0014)	-0.0005 (0.0014)	-0.0005 (0.0014)	-0.0005 (0.0014)	-0.0005 (0.0014)	-0.0005 (0.0014)
Observations	21 820	21 820	21 820	21 820	21 820	21 820
Firm and year FE	Yes	Yes	Yes			
Industry and year FE				Yes	Yes	Yes
Pseudo-R <sup>2</sup>	0.239	0.239	0.239	0.239	0.239	0.239
Chi <sup>2</sup>	2566***	2565***	2566***	2566***	2565***	2566***

\*, \*\*, \*\*\* Denote significance levels of 10 percent, 5 percent and 1 percent, respectively. Standard errors are included in parentheses.

#### Appendix D4: The impact of external CEO compensation characteristics on the number of letters received

This table reports the results of the impact of external CEO compensation characteristics on the number of letters received. The dependent variable is the number of letters related to executive compensation received by a firm in a given year. The number of available observations is 2 706 firm-year observations. All independent variables are lagged by one year. Firm and year fixed effects are included. We use robust standard errors clustered at firm and year levels. See Appendix A for variable definitions.

VARIABLES	Number of letters received in a year						
	(1) Neg Binomial	(2) Neg Binomial	(3) Neg Binomial	(4) Neg Binomial	(5) Neg Binomial	(6) Neg Binomial	(7) Neg Binomial
<b><u>External Comp characteristics</u></b>							
Excess CEO pay gap	0.0293* (0.0359)						
Excess CEO pay slice		0.167* (0.289)					
Excess TMT pay disparity			0.0736 (0.125)				
Excess compensation				0.0330 (0.0549)			
<b><u>Internal Comp characteristics</u></b>							
Log CEO pay gap					0.0330** (0.0190)		
CEO pay slice						0.211 (0.158)	
TMT pay disparity							0.0704 (0.0685)
<b><u>Governance characteristics</u></b>							
Independent directors	0.0304 (0.129)	0.0300 (0.129)	0.0312 (0.129)	0.0292 (0.129)	0.0305 (0.0715)	0.0329 (0.0716)	0.0340 (0.0716)
CEO Comp committee	-0.158 (0.196)	-0.158 (0.196)	-0.157 (0.196)	-0.157 (0.196)	-0.0148 (0.138)	-0.0151 (0.138)	-0.0136 (0.138)
CEO tenure	-0.0122 (0.0388)	-0.0121 (0.0389)	-0.0110 (0.0388)	-0.0114 (0.0388)	0.0032 (0.0202)	0.0024 (0.0203)	0.0053 (0.0201)
CEO/Chairman	-0.0274 (0.108)	-0.0253 (0.107)	-0.0252 (0.107)	-0.0260 (0.108)	0.0085 (0.0376)	0.0099 (0.0376)	0.0101 (0.0376)
<b><u>Section 408 criteria</u></b>							
IC_Weak	0.204* (0.113)	0.205* (0.113)	0.204* (0.113)	0.204* (0.113)	0.0454 (0.0716)	0.0463 (0.0716)	0.0452 (0.0716)
Restate	-0.0010	-0.0001	-0.0028	-0.0014	0.0560	0.0551	0.0540

	(0.0991)	(0.0991)	(0.0991)	(0.0991)	(0.0652)	(0.0652)	(0.0652)
High Volatility	0.0743 (0.0926)	0.0748 (0.0926)	0.0754 (0.0926)	0.0752 (0.0926)	0.0451 (0.0568)	0.0502 (0.0567)	0.0508 (0.0567)
Log Market value	0.0123 (0.0707)	0.0167 (0.0706)	0.0162 (0.0706)	0.0121 (0.0709)	-0.0075 (0.0169)	0.0073 (0.0143)	0.0067 (0.0144)
Market to Book	-0.0199 (0.0463)	-0.0192 (0.0463)	-0.0195 (0.0463)	-0.0198 (0.0463)	-0.0146 (0.0196)	-0.0154 (0.0197)	-0.0155 (0.0196)
<b><u>Other company characteristics</u></b>							
Firm age	-0.0436 (0.338)	-0.0277 (0.337)	-0.0282 (0.337)	-0.0407 (0.339)	0.0019 (0.0043)	0.0017 (0.0043)	0.0017 (0.0043)
Loss	-0.0122 (0.0920)	-0.0131 (0.0920)	-0.0142 (0.0919)	-0.0143 (0.0919)	-0.0410 (0.0526)	-0.0379 (0.0526)	-0.0398 (0.0526)
Low Market to Book	-0.0572 (0.118)	-0.0542 (0.118)	-0.0548 (0.118)	-0.0564 (0.118)	-0.0142 (0.0656)	-0.0105 (0.0656)	-0.0135 (0.0656)
Z-score	-0.0011 (0.0112)	-0.0013 (0.0112)	-0.0012 (0.0112)	-0.0011 (0.0112)	0.0023 (0.0049)	0.00181 (0.0048)	0.0018 (0.0048)
Sales Growth	0.0005 (0.103)	0.0116 (0.102)	0.0092 (0.102)	0.0033 (0.103)	0.0732 (0.0522)	0.0771 (0.0521)	0.0771 (0.0521)
M&A	-0.0112 (0.0676)	-0.0107 (0.0676)	-0.0102 (0.0676)	-0.0105 (0.0676)	0.0097 (0.0368)	0.0107 (0.0369)	0.0101 (0.0368)
Restructuring	-0.0489 (0.0755)	-0.0467 (0.0755)	-0.0466 (0.0755)	-0.0482 (0.0755)	-0.0410 (0.0398)	-0.0343 (0.0396)	-0.0349 (0.0396)
External Financing	-0.201 (0.334)	-0.199 (0.334)	-0.197 (0.334)	-0.198 (0.334)	-0.197 (0.210)	-0.195 (0.210)	-0.185 (0.210)
Segments	-0.0021 (0.0014)	-0.0021 (0.0014)	-0.0021 (0.0014)	-0.0021 (0.0014)	0.0001 (0.0004)	0.0001 (0.0004)	0.0001 (0.0004)
Constant	-0.374 (1.182)	-0.444 (1.177)	-0.446 (1.177)	-0.388 (1.183)	-0.261 (0.430)	-0.200 (0.426)	-0.173 (0.425)
Observations	2 706	2 706	2 706	2 706	2 706	2 706	2 706
Firm and year FE	Yes	Yes	Yes	Yes			
Industry and year FE					Yes	Yes	Yes

\*, \*\*, \*\*\* Denote significance levels of 10 percent, 5 percent and 1 percent, respectively. Standard errors are included in parentheses.