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Decomposing Managerial Incentives: The influence of Delta and Vega on M&A Acquirer Returns

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Abstract

Previous empirical research on mergers and acquisitions (M&A) has examined whether managerial compensation incentives influence acquisition announcement returns. Studies have primarily explored the standalone effects of two equity-based compensation incentives, pay-performance sensitivity, captured by Delta, and pay-risk sensitivity, captured by Vega, which theoretically exert opposite effects on managerial decisions. However, evidence regarding their direct influence on acquisition announcement returns remains nuanced, with mixed results depending on deal and firm characteristics, as well as managerial behavior.

Therefore, this dissertation explores the extent to which CEO equity incentives are associated with acquisition announcement returns and whether CEO overconfidence moderates this relationship. The empirical analysis is based on 1,813 acquisition observations undertaken by 549 publicly listed U.S. acquiring firms between 2009 and 2020. Acquisition announcement returns are measured using cumulative abnormal returns (CARs) around acquisition announcements, CEO incentives are decomposed into Delta and Vega, and CEO overconfidence is estimated using the *Holder67* proxy. To test the hypothesis, Ordinary Least Squares regressions are employed with firm clustering, robust standard errors, year fixed effects, and Fama-French 48 industry fixed effects, complemented by several robustness tests.

The results demonstrate no statistically significant effect of CEO Delta, CEO Vega, or CEO overconfidence on acquisition announcement returns. However, the interaction term between CEO Vega and overconfidence is positive and statistically significant at the 10% level, suggesting that the market reacts more favorably to risk-taking incentives when integrated with managerial overconfidence. Overall, these findings shed light on the importance of integrating agency theory and behavioral finance when assessing executive compensation and acquisition decisions.

Keywords: mergers and acquisitions; executive compensation; CEO incentives; CEO overconfidence; acquirer announcement returns

Resumo

Literatura empírica sobre fusões e aquisições (F&A) tem analisado se os incentivos remuneratórios dos gestores influenciam o desempenho das aquisições. Os estudos focam-se no efeito isolado de dois incentivos baseados em ações: a sensibilidade da remuneração ao desempenho, representada pelo Delta, e a sensibilidade da remuneração ao risco, capturada pelo Vega, que, teoricamente, exercem efeitos opostos sobre as decisões dos gestores. No entanto, a evidência empírica sobre a sua influência direta nos retornos dos anúncios de aquisições permanece ambígua, dependendo das características da transação, da empresa e do comportamento dos gestores.

Esta dissertação analisa a influência dos incentivos remuneratórios dos CEOs nos retornos dos anúncios de aquisições e investiga se a superconfiança modera essa relação. A análise empírica baseia-se numa amostra de 1813 aquisições realizadas por 549 empresas adquirentes cotadas nos EUA entre 2009 e 2020. O desempenho das aquisições é medido através dos retornos anormais acumulados (CAR), os incentivos remuneratórios são decompostos em Delta e Vega, e a superconfiança é medida pela aproximação *Holder67*. Para testar as hipóteses formuladas, são estimados modelos de regressão por Mínimos Quadrados Ordinários (MQO), com erros-padrão robustos agrupados ao nível da empresa, efeitos fixos anuais e efeitos fixos por indústria segundo a classificação Fama-French de 48 indústrias, complementados por diversos testes de robustez.

Os resultados não evidenciam qualquer efeito estatisticamente significativo do Delta, do Vega ou do excesso de confiança dos CEOs nos retornos dos anúncios. No entanto, o termo de interação entre o Vega e a superconfiança apresenta um coeficiente positivo e estatisticamente significativo ao nível de 10%, indicando que o mercado reage mais favoravelmente aos incentivos ao risco quando acompanhado por excesso de confiança dos gestores. Estes resultados reforçam a importância de integrar a Teoria da Agência e as Finanças Comportamentais na análise da remuneração dos executivos e das decisões de F&A.

Palavras-chave: fusões e aquisições; remuneração dos executivos; incentivos dos CEOs; superconfiança do CEO; retornos dos anúncios de aquisição

Table of Contents

1. Introduction 1

2. Literature Review 4

2.1. Theoretical Foundations – Agency Theory 4

2.2. Executive Compensation 5

2.2.1. Alignment incentive and risk-taking incentive 6

2.3. Mergers and Acquisitions 8

2.3.1. Characteristics and motivations 8

2.3.2. Acquisition performance and Cumulative Abnormal Returns (CARs) 10

2.4. Executive Compensation and M&A Performance 11

3. Research Hypotheses 14

3.1. CEO Equity Incentives and Acquisition Announcement Returns 14

3.2. CEO Overconfidence and Acquisition Announcement Returns 15

3.3. The Moderating Role of CEO Overconfidence 15

4. Methodology 17

4.1. Data Collection and Sample Construction 17

4.1.1. Research Design and Data Source 17

4.1.2. Data Cleaning and processing 19

4.2. Variable Definition and Measurement 20

4.2.1. Dependent Variable 20

4.2.2. Independent Variables 21

4.2.3. Moderating Variable 22

4.2.4. Control Variables 23

4.3. Descriptive Statistics and Correlation Analysis 25

4.3.1. Descriptive Statistics 25

4.3.2. Correlation Analysis 27
4.4. Empirical strategy 28
4.4.1. Baseline Regression Models 29
4.4.2. Moderating Regression Models 29
4.4.3. Econometric Tests and Model Specification 30
4.4.4. Threats to Identification 31
4.5. Robustness checks 32
5. Results and Discussion 34
5.1. Baseline Regressions 34
5.2. The CEO's overconfidence moderating role on managerial incentives 38
5.3. Robustness checks 41
5.3.1. Alternative Event Windows 42
5.3.2. Alternative Asset-Pricing Model: Fama-French Five-Factor Model 44
5.3.3. Alternative Measure for CEO Overconfidence: Holder100 45
5.3.4. Alternative Specification: Excluding Fixed Effects 46
6. Conclusion 47
References 50
Appendix 56

List of Tables

Table 1- Summary Statistics 25
Table 2- Managerial incentives and acquirer announcement returns (H1) 35
Table 3- CEO Overconfidence and Acquirer Announcement Returns (H2).....37
Table 4- CEO Overconfidence as a Moderator of Managerial Incentives and CARs (H3) 39
Table 5- Alternative Event Windows- Robustness Test 1 42
Table 6- Fama-French Five-Factor CARs - Robustness Test 2 44
Table 7- Alternative CEO Overconfidence Proxy - Robustness Test 3.....45
Table A- Variable definition and measurement …..…….... 56
Table C- ExecuComp Variable Identifiers ……...……...… 57
Table F1- Pearson Correlation Matrix ……..…… 64
Table F1- Pearson Correlation Matrix ……..…… 64
Table F2 – Summary of Econometric Diagnostic Tests …..…… 65
Table G1- Full Results for Alternative Event Windows for Managerial Incentives (H1) ... 66
Table G2- Full Results for Alternative Event Windows for CEO overconfidence (H2)… 67
Table G3- Full Results for Alternative Event Windows for Delta Moderation (H3a) …... 68
Table G4- Full Results for Alternative Event Windows for Vega Moderation (H3b) …..... 69
Table H1- Complete Results from the Fama-French Five-Factor CARs ……... 70
Table H2 – Full Results of the Alternative Measure for CEO Overconfidence ……..... 71
Table J1- Baseline Regressions without Fixed Effects ..…… 72
Table J2- Interaction Regressions (H3a, H3b) without Fixed Effects …..……..… 73

List of Figures

Figure B1 – Data collection and Matching workflow ….…….…. 57
Figure B2- Key Variables estimation framework …….. 58

1. Introduction

Mergers and acquisitions (M&A) are among the most important strategic investment decisions undertaken by firms, allowing firms to expand operations, enter new markets, strengthen competitive positions, and generate operational and financial synergies. Given the substantial financial commitments involved, acquisition decisions have profound implications for firm value and shareholder wealth (Andrade et al., 2001; Weston et al., 2004). Despite their strategic relevance, the extent to which mergers and acquisitions systematically generate value for acquiring shareholders remains debated. Empirical evidence consistently suggests that, on average, acquisition announcements generate limited to negative abnormal returns for the acquiring firms while simultaneously creating significant gains for target shareholders (Andrade et al., 2001; Asquith et al., 1982; Fuller et al., 2002; Moeller et al., 2004, 2005).

The explanation regarding this considerable heterogeneity in acquisition outcomes may lie in managerial decision-making. Traditional corporate finance theory suggests that managers and shareholders have distinct interests because executives may pursue acquisitions that maximize their own utility, rather than shareholders' wealth (Jensen, 1986; Jensen & Meckling, 1976). As a result, companies rely heavily on executive compensation as a governance mechanism designed to align managerial incentives with shareholders' interests (Jensen & Murphy, 1990).

Conversely, modern compensation theory proposes that equity-based compensation does not generate a unique incentive. While pay-performance sensitivity, captured by Delta, is intended to align managers' interests with those of shareholders, it can ultimately expose managers to excessive firm-specific risk, increasing managerial conservatism and discouraging them from pursuing uncertain, transformative investments. On the other hand, pay-risk-sensitivity, captured by Vega, may counterbalance such conservatism through convex payoffs that increase the incentives to undertake risk, potentially encouraging them to undertake more innovative and ambitious acquisitions (Croci & Petmezas, 2015; Durongkadej et al., 2021; Goel & Thakor, 2008; Ikram et al., 2020; Lin et al., 2018; Mazur & Salganik-Shoshan, 2019; Pan et al., 2025). These distinct dimensions of compensation may therefore affect acquisition decisions in inherently different ways (Core & Guay, 1999, 2002).

Over the past decades, behavioral corporate finance has challenged the traditional finance perspective that executives act as fully rational agents. In particular, the concept of

CEO overconfidence has emerged as a key behavioral characteristic that influences corporate investment decisions. According to this perspective, overconfident managers systematically overestimate their ability to generate acquisition synergies, underestimating risks, and potentially increasing acquisitiveness and overpayment (Goel & Thakor, 2008; Malmendier & Tate, 2005, 2008; Roll, 1986). More recent studies have highlighted the importance of behavioral traits in understanding merger and acquisition performance, noting that managerial biases may affect not only acquisition decisions but also investors' perceptions of those decisions (Ismail & Mavis, 2022; Nie & Yen, 2024).

Although an extensive body of literature has examined executive compensation and CEO overconfidence, limited evidence exists regarding how behavioral biases affect the effectiveness of specific compensation incentives in mergers and acquisitions. Most empirical research focuses on studying executive compensation as a unique governance mechanism, overlooking the different effects of alignment incentives (Delta) and risk-taking incentives (Vega). Likewise, studies on CEO overconfidence usually explore its direct impact on acquisition behavior, without examining its potential influence on how executives respond to those compensation incentives. This dissertation aims to address this gap by examining the relationship between executive compensation incentives, CEO overconfidence, and acquisition announcement returns. It investigates whether Delta and Vega exert direct effects on shareholder value creation following acquisition announcements and the extent to which these relationships are moderated by CEO overconfidence.

For that purpose, this dissertation uses a sample of completed U.S. M&A undertaken between 2009 and 2020. The final sample comprises 1,813 acquisitions undertaken by 549 publicly listed U.S. acquiring firms between 2009 and 2020. The sample combines deal information obtained from Orbis M&A, financial and accounting data from Refinitiv/LSEG Workspace, and executive compensation data from ExecuComp. Furthermore, CEO compensation incentives are decomposed into Delta and Vega, following Core & Guay (2002), while managerial overconfidence is measured using the *Holder67* option exercise proxy proposed by Malmendier & Tate (2005). The empirical analysis uses Ordinary Least Squares (OLS) regressions estimated with firm clustering and robust standard errors, Fama-French 48 industry fixed effects, and year fixed effects, complemented by several robustness tests.

According to the empirical findings, neither CEO Delta nor CEO Vega exhibit a statistically significant direct association with acquisition announcement returns. Similarly, CEO overconfidence is not significantly associated with acquisition announcement returns after

controlling for firm and deal-specific factors. However, the results provide evidence that CEO overconfidence positively moderates the relationship between Vega and acquisition announcement returns, suggesting that the association between risk-taking incentives and acquisition announcement returns is more positive when the executive shows characteristics of managerial overconfidence. This positive interaction is broadly consistent in sign and in terms of economic relevance across alternative asset-pricing models and the stricter definition of CEO overconfidence, although statistical significance is not consistently maintained for alternative event windows and robustness specifications.

The key contribution of this dissertation is to move beyond treating executive compensation incentives as homogeneous mechanisms by understanding whether their relationship with acquisition announcement returns depends on behavioral characteristics of the CEO receiving them. First, it extends previous studies on executive compensation by separately exploring the effects of alignment incentives (Delta) and risk-taking incentives (Vega) on acquisition announcement returns, rather than relying on aggregate compensation measures. Second, it integrates behavioral considerations into the traditional agency framework by examining CEO overconfidence as a moderating mechanism between executive incentives and shareholder value creation. Finally, employing cumulative abnormal returns around acquisition announcements as a market-based measure of investors' short-run assessment of acquisition value, it provides evidence on investors' perceptions of the interaction between compensation design and managerial behavioral characteristics.

The remainder of this dissertation is organized as follows. Chapter 2 reviews the empirical literature on mergers and acquisitions, executive compensation, and behavioral corporate finance. Then, Chapter 3 identifies the research hypotheses explored in this study, followed by Chapter 4, which describes data, variable construction, descriptive statistics, correlation analysis, econometric specifications, diagnostic tests, and empirical estimation procedures. Chapter 5 presents the main regression results and assesses their robustness using alternative event windows, asset-pricing specifications, and measures of CEO overconfidence. Lastly, Chapter 6 concludes with a discussion of the main findings, practical implications, limitations, and avenues for future research.

2. Literature Review

2.1. Theoretical Foundations – Agency Theory

Modern corporations are characterized by the separation of ownership and control, whereby shareholders delegate decision-making authority to professional managers. This separation creates potential conflicts of interest between principals (shareholders) and agents (managers), building the foundation of Agency Theory (Jensen & Meckling, 1976).

As suggested by Jensen & Meckling (1976), managers and shareholders are assumed to be rational utility maximizers whose objectives do not necessarily coincide. Thus, managers may pursue actions that maximize their own utility rather than shareholder wealth, creating agency costs. These conflicts become particularly significant in large-scale investment decisions such as Mergers and Acquisitions (M&A), where managers possess substantial discretion over the allocation of corporate resources.

One of the most frequently discussed manifestations of agency conflicts is empire-building behavior, whereby managers undertake corporate expansion to increase their compensation, managerial prestige, and power rather than to enhance shareholder value (Jensen & Meckling, 1976). This is further extended by the Free Cash Flow Hypothesis, which states that managers with abundant free cash flow are incentivized to waste these surplus funds on low-return, or even value-destroying acquisitions rather than distribute them to shareholders as dividends (Jensen, 1986). Moreover, these conflicts are exacerbated by information asymmetry between managers and shareholders (Myers & Majluf, 1984). Consequently, shareholders face significant difficulties monitoring managerial decisions, creating moral hazard problems (Holmström, 1979; Jensen & Meckling, 1976).

To mitigate these conflicts, firms rely on corporate governance mechanisms able not only to monitor managerial behavior more efficiently but also to ensure greater alignment between the executives' interests and those of the shareholders, reducing managerial opportunism (Fama & Jensen, 1983; Milgrom & Holmström, 1991; Shleifer & Vishny, 1988). These mechanisms include oversight, ownership concentration, institutional monitoring, shareholder rights, and executive compensation.

On the one hand, external governance mechanisms impose discipline on managerial behavior through market and institutional forces beyond the firm's direct control. Such mechanisms include the market for corporate control, external auditing, legal protection of investors, and regulatory oversight, all of which restrict managerial discretion and reduce the scope for opportunistic behavior (Manne, 1965; Watts & Zimmerman, 1983).

On the other hand, internal governance mechanisms are based upon the firm's organizational structure and are designed to align managers' interests with those of the shareholders. These mechanisms include board independence, ownership concentration, institutional ownership, shareholder monitoring, and executive compensation policies, which collectively seek to improve managerial accountability and decision-making (Fama & Jensen, 1983; Shleifer & Vishny, 1988).

An extensive body of empirical literature demonstrates that stronger governance structures are associated with higher firm value and improved corporate performance. Firms with stronger shareholder rights generally exhibit superior market valuations and higher stock market performance (Gompers et al., 2003), whereas weaker governance structures are related to poorer operating performance and lower firm value (Bebchuk et al., 2009). More broadly, effective governance strengthens managerial accountability, improves investment decisions, and ultimately promotes long-term value creation (Acharya et al., 2011).

Among the various governance mechanisms available to companies, executive compensation occupies a distinctive role. Unlike most governance instruments, which primarily constrain managerial behavior *ex post* through monitoring and oversight, compensation contracts operate *ex ante* by shaping managers' personal wealth to corporate outcomes. Nevertheless, agency theory does not imply that stronger incentives necessarily improve managerial decisions, since increasing the sensitivity of managerial wealth to firm outcomes can simultaneously improve alignment and influence managers' risk-aversion. Consequently, the effectiveness of incentive contracts depends not only on the robustness of incentives but also on the specific dimension of managerial wealth that is affected, leading to a trade-off between value alignment and risk-taking. Such a distinction provides the theoretical framework for decomposing executive incentives into Delta and Vega.

2.2. Executive Compensation

Agency theory suggests that managerial incentives can be aligned with shareholder interests through optimal compensation contracts that reward value creation (Jensen & Murphy, 1990). The underlying argument is that executives are more likely to make decisions that maximize shareholder wealth when their personal wealth is directly connected to firm performance. In practice, to foster this alignment, firms often rely on equity-based compensation, particularly using restricted stock and stock options. Hall & Liebman (1998) and Core & Guay (1999) document that equity compensation accounts for a considerable portion of

the CEO pay in U.S. publicly traded firms, increasing executives' exposure to changes in firm value.

Despite its theoretical appeal, the effectiveness of executive compensation remains subject to substantial debate. While Jensen & Murphy (1990) argue that performance-based compensation increases incentive alignment, Bebchuk & Fried (2003) argue that, despite the potential benefits of incentive alignment, executive compensation can also exacerbate agency problems, since the same compensation instruments may themselves reflect managerial influence over the compensation-setting process. In such a framework, it is plausible to argue that compensation structures may fail to mitigate agency conflicts and rather become manifestations of managerial power.

More recent research has further highlighted that executive compensation contracts are inherently multidimensional and should be designed in line with the firm's investment opportunities, governance environment, and risk profile. Rather than viewing compensation uniquely as a mechanism to mitigate agency conflicts, contemporary contracting theory argues that optimal compensation packages jointly determine managerial incentives for value creation and risk-taking while accounting for a firm's specific characteristics (Edmans & Gabaix, 2016). This multidimensionality is specifically relevant for acquisition decisions, where managers simultaneously face incentives to maximize firm value and to undertake risky investments. As such, studying aggregate equity compensation may overlook economically distinct incentive mechanisms, highlighting the need for a separate study of Delta and Vega.

2.2.1. Alignment incentive and risk-taking incentive

Acknowledging the multidimensional nature of executive compensation, Core & Guay (1999, 2002) provide a key methodological framework for measuring the underlying incentive effects of executive compensation by decomposing managerial wealth incentives into two distinct components: Delta and Vega.

Delta measures the sensitivity of managerial wealth to changes in the company's stock price, capturing the extent to which executives benefit from increases in shareholder value. A greater Delta implies that executives benefit from increases in shareholder wealth, therefore improving the alignment between managers and shareholders (Core & Guay, 2002; Hall & Liebman, 1998). However, greater Delta also increases the CEO's exposure to firm-specific wealth fluctuations, which may increase managerial risk aversion and discourage investments characterized by uncertainty.

Conversely, Vega measures the extent to which compensation contracts can induce higher risk-taking activities and represents the sensitivity of managerial wealth to changes in stock return volatility. Since stock options have a convex payoff structure, with limited downside risk at the strike price but an unlimited upside, they introduce convexity in the managers' wealth function. As a result, value increases with volatility, suggesting that implementing option-based compensation may lead managers to seek financially risky investments actively, benefiting from greater stock price volatility (Guay, 1999; Rajgopal & Shevlin, 2002). Similarly, higher Vega is not necessarily associated with a positive or negative outcome; while it can encourage value-enhancing risk-taking by overcoming managerial risk aversion, it may also ultimately incentivize excessive risk-taking and value-destroying empire-building.

Empirical literature provides evidence concerning the distinct effects of these incentives. Coles et al. (2006) demonstrate that CEOs with greater Vega engage in significantly riskier corporate policies, including higher leverage ratios, greater research and development expenditures, and more aggressive investment strategies. Brockman et al. (2010) further show that beyond influencing financing and investment decisions, these compensation incentives are especially significant under conditions of increasing uncertainty.

Despite establishing a strong relationship between Vega and corporate risk-taking, these findings do not address whether such risk-taking is intrinsically value-enhancing. In the context of acquisitions, greater risk tolerance may encourage the pursuit of value-creating acquisitions, but it can equally lead to overpayment or excessive acquisition risk; this ambiguity sets the need to study the interaction of Vega and CEO overconfidence rather than assuming a uniformly positive effect.

More recent research emphasizes the importance of balancing incentive alignment and risk-taking when outlining executive compensation contracts (Armstrong et al., 2013; Edmans & Gabaix, 2016). More importantly, compensation structures may simultaneously encourage value-maximizing behavior and excessive risk-taking, depending on the corresponding relevance of Delta and Vega; these findings demonstrate that greater risk-taking is not systematically a signal of greater value creation. Increased risk tolerance may enable managers to pursue positive-NPV investment opportunities that would otherwise be rejected; it can also strengthen excessive or badly disciplined risk-taking. Thus, the expected effect of Vega on acquisition outcomes is theoretically ambiguous, making its interaction with executive characteristics especially relevant.

Although traditional agency models implicitly assume rational managers, recent

behavioral contracting literature suggests that executives may perceive and respond to compensation incentives differently depending on their psychological traits. Particularly, CEO overconfidence may alter the effectiveness of equity-based incentives because overconfident managers systematically overestimate future firm performance and underestimate investment risk (Gervais et al., 2011; Humphery-Jenner et al., 2016). Subsequently, the relationship between Delta, Vega, and corporate investment decisions may depend not only on contract design but also on managerial behavioral characteristics.

Thus, understanding this distinction between alignment and risk-taking incentives is particularly crucial in the context of mergers and acquisitions, where executives must evaluate high-risk investment opportunities that involve significant capital commitments and uncertain future synergies.

2.3. Mergers and Acquisitions

2.3.1. Characteristics and motivations

Mergers and Acquisitions are crucial corporate investment decisions in which firms integrate with or acquire other firms to pursue growth opportunities, increase market power, obtain strategic resources, achieve operational efficiencies, or even diversify their activities (Andrade et al., 2001).

M&A activity is also influenced by broader macroeconomic and financial conditions, frequently occurring in cyclical periods known as *merger waves*, during which acquisition activity becomes concentrated across industries. Shleifer & Vishny (2003) propose a market-driven paradigm of acquisitions, showing that merger waves are primarily driven by stock market misvaluation. More specifically, overvalued firms may exploit their relatively expensive equity by acquiring undervalued targets through stock-financed deals. Accordingly, Harford (2005) argues that merger waves are facilitated by favorable capital market conditions, regulatory changes, and technological shocks, which decrease financing constraints and foster corporate restructuring.

Acquisitions differ in several dimensions, specifically the relationship between the acquiring and target firms and the method of payment. These deals may involve companies operating in the same industry or across unrelated sectors (Berger & Ofek, 1995; Morck et al., 1990) and can be financed with cash, stock, or a combination of both (Fuller et al., 2002; Travlos, 1987). These characteristics are economically relevant because they shape financing incentives, integration complexity, and market perceptions, consequently influencing

acquisition performance (Andrade et al., 2001; Myers & Majluf, 1984).

The underlying motivations for mergers and acquisitions can be mainly divided into value-maximizing and behavioral explanations. Traditional corporate finance theory argues that firms engage in acquisitions to create shareholder value through financial and operational synergies, creating economies of scale, diversification, or even increasing market power (Weston et al., 2004). Under this approach, acquisitions are considered rational investment decisions intended to improve long-term performance.

On the other hand, behavioral finance argues that acquisitions can also stem from managerial biases, rather than being solely driven by value-maximizing objectives. Roll's (1986) hubris hypothesis posits that managers overestimate their ability to generate post-merger synergies, leading them to overpay for acquisition targets and consequently destroy shareholder value. Similarly, Jensen (1986) proposes that acquisitions may arise from agency conflicts, since managers pursue empire-building strategies that increase firm size, managerial power, and compensation, rather than shareholder wealth.

Evidence also shows that managerial overconfidence may intensify over time. CEOs who experience successful acquisitions often become increasingly confident in their acquisition abilities, leading to serial acquisitions that generate progressively weaker shareholder returns (Billett & Qian, 2008). Moreover, overconfidence appears particularly relevant in more complex investment decisions, such as cross-border acquisitions, where information asymmetries and integration challenges are greater (Ferris et al., 2013).

The literature, therefore, suggests that acquisition outcomes cannot be attributed solely to a single underlying mechanism, as market reactions often reflect interactions among behavioral traits, deal characteristics, managerial incentives, market conditions, and strategic objectives. Because these transactions involve significant managerial discretion and substantial capital commitments, they provide an ideal framework for exploring how executive incentives affect investment decisions and acquisition performance. This heterogeneity of conditions provides a fundamental basis for examining whether the characteristics of the acquiring CEO and the incentives embedded in their compensation help explain announcement returns after controlling for observable deal, executive, and firm characteristics.

2.3.2. Acquisition performance and Cumulative Abnormal Returns (CARs)

Whether mergers and acquisitions create or destroy value remains one of the central questions in finance literature. Acquisition performance is mainly assessed using either accounting-based measures, which evaluate post-merger operating results, or market-based measures, specifically Cumulative Abnormal Returns (CARs), that reflect investors' immediate assessment of the expected value implications of acquisition announcements.
Event-study methodology is grounded in the semi-strong form of market efficiency, according to which publicly available information is quickly reflected in stock prices (Fama, 1970; Fama et al., 1969). Furthermore, cumulative abnormal returns around acquisition announcements provide a market-based measure of investors' expectations concerning the value created or destroyed by a transaction (Brown & Warner, 1980, 1985). Compared with post-acquisition accounting-based measures, CARs provide a more immediate evaluation of investors' expectations and are less influenced by subsequent accounting adjustments and integration outcomes.

Yet, CARs capture investors' immediate expectations rather than realized long-term acquisition performance, meaning that a positive announcement reaction does not necessarily imply that an acquisition ultimately creates value. In contrast, a negative market reaction may also reflect uncertainty regarding an otherwise strategically valuable deal. One limitation of this literature is that CARs should, therefore, be interpreted as a measure of the market's short-term perspective, not as a comprehensive measure of post-acquisition performance.

In addition to the event-study methodology itself, several deal-specific characteristics have been shown to condition announcement returns. Travlos (1987) shows that cash-financed acquisitions usually lead to greater market reactions than stock-financed deals, highlighting that the method of payment conveys valuable information about the acquiring firm's valuation and financing conditions. Likewise, target characteristics and deal-structure specifics also contribute to acquisition performance.

Nevertheless, the strategic motivations behind acquisitions are evident in empirical evidence that persistently indicates an asymmetric distribution of value creation. Target shareholders typically experience significant positive abnormal returns following acquisition announcements, whereas acquiring firms tend to earn slightly positive, zero, or even negative abnormal returns (Andrade et al., 2001; Fuller et al., 2002; Moeller et al., 2004), which suggests that acquisitions do not systematically improve shareholder wealth for acquiring firms.

Several explanations have been proposed to account for these results; both Rhodes-Kropf & Viswanathan (2004) and Shleifer & Vishny (2003) point out that temporary stock market overvaluation may encourage firms to undertake acquisitions, especially through stock-financed deals, thereby increasing the potential for overpayment and consequent value destruction.

Beyond market conditions, managerial incentives provide an additional explanation for acquisition performance. Morck et al. (1990) propose that diversifying acquisitions outside of the firm's key business are more likely to result in shareholder value destruction, suggesting that managerial opportunism and empire-building motives frequently overshadow value-maximizing objectives. Following the same line of thought, Moeller et al. (2004) demonstrate that larger acquiring firms exhibit substantially lower announcement returns, stressing the role of agency problems and managerial overconfidence.

Billett & Qian (2008) further demonstrate that CEOs who complete acquisitions become increasingly overconfident due to self-attribution bias, making them more likely to pursue subsequent acquisitions that generate lower shareholder returns. These findings reinforce the argument that managerial behavioral traits play an important role in explaining acquisition performance (Hirshleifer et al., 2012; Malmendier & Tate, 2008). Consistent with these arguments, Doukas & Petmezas (2007) document that acquisitions undertaken by overconfident CEOs generate significantly lower announcement returns, providing direct evidence that managerial overconfidence can adversely affect shareholder value creation in M&A deals.

Thus, literature advocates that acquisition performance reflects the integration of corporate governance mechanisms, deal attributes, firm characteristics, managerial behavior, and market conditions. This complexity, therefore, provides the basis for exploring whether executive compensation incentives also determine acquisition outcomes.

2.4. Executive Compensation and M&A Performance

Given the strategic relevance and uncertainty surrounding mergers and acquisitions, executive incentives play a fundamental role in shaping managerial investment decisions. Since acquisitions involve significant financial commitments and considerable managerial discretion, compensation contracts may influence both the likelihood of undertaking acquisitions and the quality of those investment transactions.

Empirical evidence directly examining CEO equity incentives in mergers and acquisitions

argues that executive stock and option holdings influence both acquisition decisions and market reactions. Cai & Vijh (2007) demonstrate that CEOs' equity-based incentives affect acquisition announcement returns, shaping executives' willingness to undertake value-creating acquisitions and the terms under which transactions are completed.

According to the agency theory framework, executive compensation is designed to align managerial objectives with those of shareholders, thereby reducing agency conflicts that arise from the separation of ownership and control (Jensen & Meckling, 1976; Jensen & Murphy, 1990). However, previous research demonstrates that distinct components of executive compensation generate different managerial incentives, ultimately leading to heterogeneous acquisition outcomes.

Alignment incentives are typically captured by CEO Delta, which accounts for the sensitivity of managerial wealth to changes in the firm's stock price (Core & Guay, 2002). Since increases in firm value directly enhance executives' wealth, CEOs with higher Delta have greater incentives to maximize shareholder wealth when assessing acquisition opportunities. Consequently, they may demonstrate greater discipline in investment decisions, focusing on acquisitions that are expected to generate firm value while limiting unjustified downside risk. Consistent with this perspective, Datta et al. (2001) demonstrate that CEO equity ownership increases the likelihood of value-creating acquisitions, while Masulis et al. (2007) argue that stronger governance structures are typically associated with better acquisition performance.

On the other hand, CEO Vega measures the sensitivity of executive wealth to stock return volatility and thus represents managerial risk-taking incentives (Core & Guay, 1999; Guay, 1999). As stock options exhibit convex payoff structures, their value rises with increasing volatility in stock returns, encouraging managers to pursue riskier corporate investments. Therefore, CEOs with greater Vega may be more willing to undertake acquisitions that entail higher complexity, integration risk, and uncertainty.

Similarly, Coles et al. (2006) show that higher Vega is related to riskier investment policies, such as greater leverage and increased investment intensity. In the context of acquisitions, stronger risk-taking incentives may encourage managers to pursue ambitious acquisitions involving high uncertainty, thus increasing the likelihood of overpayment and integration problems. Moreover, Harford & Li (2007) indicate that CEOs often receive significant compensation following acquisitions regardless of whether the acquisitions generate shareholder value, raising considerable concerns about managerial self-interest and the

effectiveness of compensation contracts.

Such findings are consistent with the behavioral finance literature, specifically Roll's (1986) hubris hypothesis, which posits that overconfident managers systematically overestimate their ability to create post-merger synergies, leading to overpayment of acquisition targets. Similarly, Malmendier & Tate (2005, 2008) demonstrate that overconfident CEOs exhibit greater sensitivity to internal cash flows, greater levels of overinvestment, and a stronger willingness to undertake acquisitions that eventually destroy shareholder value.
Since cumulative abnormal returns capture investors' evaluation of acquisition quality at the announcement date, they constitute an appropriate market-based measure for assessing whether executive managerial compensation incentives influence acquisition performance.

Despite extensive literature examining executive compensation and CEO overconfidence as separate determinants of corporate investment decisions, relatively limited attention has been given to understanding their interaction in the context of M&A. Existing evidence highlights that overconfident CEOs may perceive and respond to equity incentives differently from more rational managers (Humphery-Jenner et al., 2016), implying that the effects of Delta and Vega may be dependent on managerial behavioral traits. Furthermore, studies relying on aggregate measures of executive compensation may overlook potentially opposing mechanisms associated with alignment and risk-taking incentives; hence, whether these distinct incentive dimensions are differentially linked to acquisition announcement returns depending on CEO overconfidence remains an empirical question.

Building on such perspectives, this dissertation addresses this gap by separately exploring CEO Delta and CEO Vega and examining whether their associations with acquisition announcement returns are moderated by CEO overconfidence, by integrating agency theory, which emphasizes incentive alignment and managerial risk-taking, with behavioral corporate finance, which states that managers may respond differently to similar incentives depending on their psychological characteristics. Such interaction is even more relevant in the context of M&A due to the substantial capital commitments, significant managerial discretion, highly complex integration, and uncertain synergies. The following chapter defines the hypotheses derived from these theoretical and empirical arguments, which will later be empirically studied.

3. Research Hypotheses

3.1. CEO Equity Incentives and Acquisition Announcement Returns

As already discussed, Agency Theory posits that executive compensation contracts are designed to align managerial incentives with shareholders' interests, thereby mitigating agency conflicts that arise from the separation of ownership and control (Jensen & Meckling, 1976). In this context, equity-based compensation plays a crucial role because it links managerial wealth to firm performance, increasing the likelihood that executives make decisions that maximize shareholder value (Jensen & Murphy, 1990).

Previous research identifies two distinct dimensions of equity incentives. The first, Delta, captures the sensitivity of managerial wealth to changes in the firm's stock price and measures the level of alignment between managerial and shareholder interests (Core & Guay, 1999, 2002). A higher Delta increases CEOs' exposure to firm value and is consequently expected to encourage more disciplined investment decisions, particularly in extremely high-stakes corporate events such as mergers and acquisitions. Empirical research suggests that higher equity ownership is linked to higher-quality acquisitions and better acquisition outcomes (Datta et al., 2001).

The second dimension, Vega, measures the sensitivity of executive wealth to changes in stock return volatility, because stock options exhibit convex payoff structures. Greater Vega enhances managers' propensity to pursue riskier corporate investments, since increases in firm risk increase the value of executives' option portfolios (Core & Guay, 1999, 2002). Prior studies have shown that higher Vega is linked with greater leverage, greater investment intensity, and increased corporate risk-taking (Coles et al., 2006). In mergers and acquisitions, these incentives may prompt managers to pursue more ambitious and uncertain deals, thereby increasing execution risk.

Based on these contrasting theoretical mechanisms, the literature predicts that while Delta may encourage value-creating discipline, it can simultaneously lead to excessive conservatism; likewise, although Vega is linked to encouraging managers to overcome risk aversion, it may also incentivize value-destroying empire-building behavior. According to these opposing theoretical perspectives, the overall relationship between equity incentives and acquisition announcements remains an open empirical question. Therefore, this dissertation explores the combined role of both alignment incentives (Delta) and risk-taking incentives (Vega) in explaining market reactions to acquisition announcements.

H1: CEO equity incentives, captured by Delta and Vega, are significantly associated with acquisition announcement returns.

3.2. CEO Overconfidence and Acquisition Announcement Returns

In addition to contractual incentives, behavioral corporate finance states that managerial behavioral traits also affect investment decisions; among these, CEO overconfidence has received particular attention. Overconfident managers tend to overestimate their ability to generate value, underestimate acquisition risks, and overvalue expected post-merger synergies (Malmendier & Tate, 2005, 2008; Roll, 1986).

According to Roll (1986), the hubris hypothesis holds that these behavioral biases may lead managers to overpay for target firms, consequently destroying shareholder value. Malmendier & Tate (2008) further argue that overconfident CEOs are more prone to pursue acquisitions, especially when operating in environments with abundant internal resources that allow them to avoid the disciplinary constraints of external financing.

Although behavioral biases are expected to influence acquisition performance, empirical evidence on whether overconfidence by itself systematically reduces acquisition performance once deal and firm characteristics are controlled for remains mixed. Consequently, the direct influence of CEO overconfidence on acquisition announcement returns constitutes an empirical issue.

H2: CEO overconfidence is significantly associated with acquisition announcement returns.

3.3. The Moderating Role of CEO Overconfidence

While agency theory emphasizes contractual incentives, behavioral finance suggests that the effectiveness of these incentives depends on managers' behavioral characteristics. Recent research further suggests that executive compensation contracts may not have uniform effects across managers since behavioral characteristics, particularly CEO overconfidence, influence how executives perceive and respond to compensation incentives (Gervais et al., 2011; Humphery-Jenner et al., 2016).

Overconfident executives consistently underestimate downside risk and overestimate their capacity to complete acquisitions (Malmendier & Tate, 2005, 2008). Following that line

of thought, the behavioral bias of overconfidence may enhance the effects of equity-based incentives, especially those embedded in stock options. Since Vega promotes greater risk-taking through convex compensation structures, overconfidence may strengthen managers' willingness to pursue ambitious acquisitions, therefore influencing how investors assess these transactions.

Likewise, alignment incentives captured by Delta may also become less effective when CEOs are overconfident. Since overconfident managers systematically overestimate the quality of their own investment decisions, they may perceive acquisitions as value-creating even when objective assessments would suggest otherwise. Therefore, the discipline effect of Delta may be weakened by managerial overconfidence.

Rather than assuming managerial incentives yield homogeneous outcomes across all executives, this dissertation explores whether their effectiveness depends on whether CEOs exhibit behavioral biases. According to the competing theoretical predictions regarding the direction of these effects, the following hypothesis arises:

H3: CEO overconfidence moderates the relationship between CEO equity incentives (Delta and Vega) and acquisition announcement returns.

4. Methodology

4.1. Data Collection and Sample Construction

4.1.1. Research Design and Data Source

Following the hypotheses presented above, this dissertation explores whether managerial equity incentives, measured by Delta and Vega, are associated with the announcement returns of acquisitions undertaken by U.S.-listed firms. To assess this research question, an acquisitions dataset was independently constructed by integrating deal, executive, and firm-level information from distinct financial databases.

Rather than relying solely on a pre-existing dataset, the final sample required extensive data extraction, cleaning, matching, and variable construction. In particular, the key explanatory variables, namely CEO Delta, CEO Vega, and Holder67, and the dependent variable, Cumulative Abnormal Returns (CARs), were manually estimated following previously established methodologies in the managerial compensation and event-study literature.
The empirical analysis presented encompasses acquisition announcements between 2009 and 2020 and considers only publicly listed U.S. acquiring firms. The final regression dataset includes 1,813 acquisition observations from 549 unique acquiring firms after completing data construction, cleaning, and merging.

Accordingly, the dataset gathers information primarily from four sources, each contributing to a distinct dimension of the empirical analysis and enabling the study of substantially important factors. First, Orbis M&A was used to obtain transaction-level information, as it provides specific data on completed acquisitions, including announcement dates, completion status, transaction value, payment method, target nationality, and industry classification.

Secondly, firm-level financial data were retrieved from LSEG Workspace, specifically including accounting variables, cash holdings, and market characteristics, all of which were used to construct the control variables computed throughout the empirical analysis.

Then, executive compensation data were obtained from the ExecuComp database, which provides comprehensive annual information on CEO compensation incentives, stock ownership, and stock option portfolios, which is important for estimating CEO Delta, CEO Vega, and the Holder67 overconfidence proxy.

Moreover, to better estimate the Cumulative Abnormal Returns, daily market factors required for the event study were obtained from Kenneth French's Data Library. In

particular, the Fama-French Three-Factor Model was employed to predict expected returns for calculating CARs, while the Five-Factor Model was subsequently implemented as a robustness check. Finally, the daily U.S. Treasury risk-free rate[1] was extracted from the official U.S. Treasury series and later incorporated into both the event study and Black-Scholes option valuation methodologies.

Following the data extraction process, the initial sample comprised 2,837 completed acquisitions announced by publicly listed U.S. acquiring firms between 2009 and 2020, extracted from Orbis M&A. According to the database's extraction criteria, only transactions with a reported deal value of at least USD 1 million (including estimated values) were retained. From this sample, only completed acquisitions were retained to ensure that the market reaction reflected transactions that were, ultimately, executed. Furthermore, transactions remaining outside the sample period were excluded because they lacked the necessary data to merge executive compensation or even to generate accounting variables.

Also, combining multiple datasets required constructing a bridge table that links firms across different identifiers. On the one hand, LSEG identifies firms using a nine-digit CUSIP; on the other hand, ExecuComp contains both the eight-digit CUSIP and the GVKEY. Therefore, a bridge table was manually created to map ISINs, CUSIPs, and GVKEYs, ensuring the consistency of identifiers across all datasets. After standardization, 834 unique companies were successfully associated across the databases.

The sample was sequentially merged with ExecuComp and LSEG Workspace, successfully matching 2,781 acquisitions (approximately 98%) with managerial compensation data, while the unmatched data corresponded to firm-year information unavailable in the ExecuComp database. Additionally, firm-level financial information from LSEG Workspace was introduced into the merged dataset, producing 2,767 matched observations. Further, two additional observations were removed due to the unavailability of cash holdings required to construct liquidity measures, resulting in 2,765 completed acquisition observations prior to estimating the key variables.

Ultimately, after independently constructing cumulative abnormal returns, CEO incentive measures, and the Holder67 overconfidence proxy, observations with incomplete information used to estimate these core variables were dropped. Although the final merged

[1] Board of Governors of the Federal Reserve System (US), "Market Yield on U.S. Treasury Securities at 7-Year Constant Maturity, Quoted on an Investment Basis [GS7]," FRED, Federal Reserve Bank of St. Louis, retrieved at 24th. June 2026, https://fred.stlouisfed.org/series/GS7.

dataset comprises 1,813 baseline acquisitions, the sample varies across model specifications, particularly due to the integration of the Holder67 proxy with additional historical option executive option data required to estimate the overconfidence. The subsequent regressions (H2 and H3), incorporating CEO behavioral characteristics, have a more restricted sample of 1,515 acquisitions, more details can be found in *Appendix B* and are represented in *Figure B1* and *Figure B2*.

4.1.2. Data Cleaning and processing

Building the final dataset required several intermediate processing stages to enable empirical analysis. Hence, given its relevance to the construction of independent variables, the executive compensation dataset required the most extensive cleaning procedures.

From the starting point, only observations corresponding to the Chief Executive Officers were retained using the CEOANN identifier, reducing the original ExecuComp dataset from 320,605 executive-year observations to about 52,138 CEO-year observations, since the remaining executive-year observations were linked to executives occupying other managerial positions.

Moreover, because of existing duplicate CEO-firm-year observations, rather than implementing an automatic deletion mechanism, these records were individually assessed using a scoring procedure designed to preserve the observation with the higher degree of option-related information. Further, a second rule was applied if two or more observations had equivalent completeness, in which case the record with the lowest permanent EXECID identifier was retained, ensuring that no unnecessary information was eliminated and avoiding duplicate CEO-firm-year observations.

Additionally, consistency checks were performed across the data preparation process, which led to the elimination of two observations (which represented only 0.004% of the dataset) showing negative numbers of exercisable options, since negative option holdings are considered economically impossible, which were subsequently replaced with missing observations rather than fully deleted, overcoming the introduction of measurement error into independent variables.

Regarding the firm-level information obtained from LSEG Workspace, it was equally important to restructure the inputs before merging, as the original wide format was transformed into a long firm-year panel dataset, expanding from 1,757 firms to approximately 21,984 firm-year observations. Following this line of thought, Cash holdings and risk-free

rate data were also prepared using analogous procedures, with minor alterations.

Furthermore, to reduce potential look-ahead bias and common concerns regarding reverse causality between acquisition outcomes and managerial incentives, all explanatory and control variables were measured at fiscal year $t-1$, whereas acquisition announcement returns were measured throughout year t. This mechanism remains consistent within executive compensation and mergers and acquisitions literature.

Finally, to ensure that empirical estimates are not biased by extreme outliers, all continuous firm-level and executive compensation variables were systematically winsorized at the 1st and 99th percentiles, mitigating the outsized effects of extreme tail values while preserving the integrity and size of the dataset.

4.2. Variable Definition and Measurement

Unlike standard accounting measures, the main variables of interest, CEO Delta, CEO Vega, Holder67 overconfidence proxy, and Cumulative Abnormal Returns (CARs), were not directly available from any commercial database. Therefore, to ensure data reliability and methodological accuracy, these variables were estimated independently using established frameworks from the corporate finance literature.

4.2.1. Dependent Variable

The dependent variable estimated to measure acquisition performance is the Cumulative Abnormal Return (CAR) around acquisition announcements. Stemming from the standard event-study methodology proposed by Brown & Warner (1985), expected stock returns were computed over an estimation window of 250 trading days, ending 30 days before the acquisition announcement [-250, -30]. This estimation window assesses normal return behavior while averting contamination from information leakage immediately preceding the announcement.

Expected returns were, therefore, estimated using the Fama & French (1993) Three-Factor Model, which extends the traditional market model by controlling for size and value risk premiums, which are particularly significant when evaluating acquiring firms. The model is specified as:

$$R_{it} - R_{ft} = \alpha_i + \beta_{iM}\left(R_{Mt} - R_{ft}\right) + \beta_{iS}SMB_t + \beta_{iH}HML_t + \varepsilon_{it}, \qquad (1)$$

where R_{it} accounts for the daily return of firm i, R_{ft} is the daily risk-free rate, R_{Mt} represents the market return, SMB_t (also known as Small Minus Big) captures the size premium, and

HML_t (also known as High Minus Low) captures the value premium. The factor loadings β are estimated using Ordinary Least Squares (OLS), and ε_{it} is the idiosyncratic disturbance term.

Furthermore, the daily abnormal return is calculated as the difference between the realized returns and the expected returns established by the Fama-French model:

$$AR_{it} = R_{it} - \mathrm{E}(R_{it}) \tag{2}$$

Cumulative abnormal returns are calculated as the sum of the daily abnormal returns over the selected event window,

$$CAR_i(t_1, t_2) = \sum_{t=t_1}^{t_2} A\,R_{it} \tag{3}$$

Following standard M&A literature (Masulis et al., 2007; Moeller et al., 2004), four alternative event windows are analyzed: CAR [-1, +1]; CAR [-2, +2]; CAR [-3, +3] and CAR [-5, +5]. However, the three-day event window, CAR [-1, +1], serves as the key specification, since it effectively captures both immediate information leakage and the market's initial reaction while mitigating noise from unrelated post-announcement events. In contrast, the remaining windows are employed for robustness checks, the construction of this variable is further explored in *Appendix E*.

4.2.2. Independent Variables

CEO incentive measures were calculated using the approximation methodology developed by Core & Guay (2002), which is widely regarded as the standard approach in the managerial compensation literature. This mechanism enables estimation of executives' equity incentives using current-year option holdings, bypassing the need to reconstruct complete historical option portfolios.

For this purpose, the required estimation variables were extracted from the ExecuComp database, including the number and estimated value of exercisable and unexercisable stock options, the fiscal year-end stock price, and the number of new options granted during the year. Option sensitivities were computed using the dividend-adjusted Black-Scholes option pricing model (Black & Scholes, 1973; Merton, 1973).

Consistent with Core & Guay (2002), these sensitivities were assigned to each CEO's outstanding option portfolio to estimate total portfolio Delta and Vega. Hence, while CEO Delta captures the sensitivity of executive wealth to changes in firm value ($\Delta = \frac{\partial W}{\partial S}$).

Theoretically, a higher Delta substantially exposes the executive to shareholder value outcomes, thereby aligning managerial incentives with shareholder wealth maximization whilst reducing empire-building agency conflicts.

CEO Vega measures the sensitivity of executive wealth to changes in stock return volatility ($\nu = \frac{\partial W}{\partial \sigma}$). Since stock options demonstrate a convex payoff structure, where there is unlimited upside and limited downside risk to the strike price, a greater Vega naturally offsets managerial risk aversion. Ultimately, it induces executives to undertake riskier, highly volatile corporate investments, such as complex acquisitions.

The remaining variables required to follow this methodology, including stock return volatility and dividend yield, were obtained from market information consistent with the Core & Guay (2002) implementation, while the risk-free rate was obtained from U.S. Treasury securities, further details for the construction of the variables are explored and discussed in *Appendix C* and visually presented in *Table C*.

4.2.3. Moderating Variable

Furthermore, managerial overconfidence is estimated using the Holder67 proxy introduced by Malmendier & Tate (2005, 2008). Unlike survey-based measures, Holder67 infers managerial overconfidence directly from a CEO's revealed stock option exercise behavior, making it substantially robust against self-reporting bias.

The implementation of Holder67 relies on the assumption that rational, under-diversified executives should exercise vested options once they become sufficiently deep in the money to reduce their firm-specific risk. Conversely, CEOs who systematically postpone exercising these valuable options reveal excessive optimism regarding future firm performance and are consequently classified as overconfident.

Following Core & Guay (2002), the average exercise price of outstanding options was approximated to compare option moneyness with the fiscal year-end stock price. Thus, CEOs are classified as overconfident if they hold exercisable options that are at least 67% in-the-money, which is consistent with Malmendier & Tate (2005, 2008).

Accordingly,

$$Holder67 = \begin{cases} 1, & if\ option\ moneyness\ \geq 67\ \% \\ 0, & otherwise \end{cases} \quad (4)$$

Since this specific moneyness ratio is not directly available in ExecuComp, it was calculated independently using the option portfolio characteristics derived from the Delta and Vega

estimates, more detailed information regarding the construction of the CEO overconfidence proxy Holder67 can be found in *Appendix E*.

4.2.4. Control Variables

To isolate the influence of managerial incentives on acquisition returns, the empirical models incorporate a comprehensive set of deal, executive, and firm-level control variables, which are widely used in the corporate finance literature.

First, to attain complexity and synergy potential, distinct deal-level controls are integrated, including deal size, payment method, industry-relatedness, and cross-border status. Deal size is calculated as the natural logarithm of the deal value to control for the economic relevance of the target, since larger deals are intrinsically associated with higher integration risks and the acquirer's financial exposure (Asquith et al., 1982).

Moreover, a categorical variable distinguishing cash, stock, mixed, and other financing methods was introduced into the model to account for the payment method. According to information asymmetry theory, stock-financed acquisitions often signal equity overvaluation and typically lead to negative market reactions, whil(Myers & Majluf, 1984; Travlos, 1987)ence (Myers & Majluf, 1984; Travlos, 1987).

Additionally, a dummy variable for industry relatedness is introduced in the models, taking the value of one if both firms operate in the same Fama-French 48 industry[2], since acquisitions within the same industry are overall expected to generate greater returns through operational synergies. At the same time, diversifying transactions often destroys shareholder value (Berger & Ofek, 1995). Cross-border status is also controlled for using a dummy variable, given the added integration complexities associated with cross-border acquisitions stemming from distinct cultural, legal, and regulatory environments (Moeller et al., 2005).

Second, to incorporate demographic and governance characteristics that can impact strategic decision-making, the models contain executive-level controls, namely CEO age, CEO gender, and CEO duality. Given that older executives often exhibit more conservative investment behaviors and are less likely to pursue transformative acquisitions, CEO age is included to account for managerial career horizons and risk aversion (Yim, 2013).

Subsequently, CEO gender controls for behavioral differences in corporate decision-making, as suggested in the existing literature; female executives typically exhibit lower

[2] Kenneth R. French, "Detail for 48 Industry Portfolios," Tuck School of Business at Dartmouth, Retrieve at 24th. August 2026, https://mba.tuck.dartmouth.edu/pages/faculty/ken.french/Data_Library/det_48_ind_port.html.

degrees of overconfidence and higher prudence in acquisition strategies compared to male executives (Huang & Kisgen, 2013). Furthermore, CEO duality is captured by a dummy variable that takes the value 1 if the individual is simultaneously the CEO and Chairman of the Board, and 0 otherwise. Its integration is based on the belief that duality may lead to the concentration of power, compromise the board's independent monitoring capacity, and potentially facilitate opportunistic behavior or value-destroying acquisitions (Masulis et al., 2007).

At the firm level, the regression models account for firm size, Tobin's Q, leverage, cash holdings, and profitability. Firm size is defined as the natural logarithm of total assets, not only because larger acquirers tend to exhibit lower announcement returns, often attributed to managerial hubris, but also because of the greater complexity of integrating large organizations (Moeller et al., 2004). Likewise, since high-Q firms are more likely to rely on overvalued equity to finance acquisitions, potentially triggering market reactions, Tobin's Q is incorporated into the model as a proxy for investment and growth opportunities. Following standard empirical practice, it is calculated as the market value of equity plus the book value of debt, divided by total assets (Servaes, 1991).

Consequently, to account for financial constraints and agency conflicts, leverage (total debt over total assets) and cash holdings (cash and cash equivalents over total assets) are also integrated into the models. Following the free cash flow hypothesis, debt can be seen as a disciplinary factor that constrains the surplus funds available for value-destroying acquisitions and empire-building behavior (Jensen, 1986), whilst cash-abundant companies are more prone to undertaking inefficient acquisitions (Harford, 1999). To control the acquirer's pre-transaction operating efficiency, profitability is measured using the Return on Assets (ROA) indicator (Morck et al., 1990).

Lastly, to mitigate bias from unobserved macroeconomic shocks, such as the COVID-19 pandemic, cyclical merger waves, and time-invariant sector-specific characteristics, industry and year fixed effects are included in all empirical specifications.

4.3. Descriptive Statistics and Correlation Analysis

This section presents the descriptive statistics of the variables used in the empirical analysis, followed by the correlation analysis.

4.3.1. Descriptive Statistics

Table 1 demonstrates the descriptive statistics for the variables explored in the empirical estimations. The initial sample comprises 1,813 completed U.S. acquisitions undertaken by 549 publicly listed acquiring firms between 2009 and 2020. To mitigate the influence of extreme observations and reduce the impact of outliers on the empirical estimates, all continuous variables were winsorized at the 1st and 99th percentiles.

Table 1- Summary Statistics

The table presents summary statistics on acquisitions, including managerial incentives and acquirer announcement returns, as well as CEO, firm, and deal-specific characteristics. The sample comprises 1,813 U.S. acquisition announcements undertaken by 549 acquiring firms from 2009 to 2020. Continuous variables are winsorized at the 1st and the 99th percentiles. Variable definitions can be found in *Table A*.

Variable	Mean	Std Dev	Min	Median	Max
Panel A: Acquirer Announcement Returns and CEO Incentives					
CAR [-1,+1]	0.0031	0.0383	-0.1450	0.0020	0.1576
CEO Delta	1.7041	6.7847	0.0040	0.4107	63.6930
CEO Vega	0.2536	0.4101	0.0000	0.0895	2.2859
CEO Overconfidence (Holder67 Dummy)	0.0607	0.2389	0.0000	0.0000	1.0000
Panel B: CEO Attributes					
Female CEO (Dummy)	0.0331	0.1789	0.0000	0.0000	1.0000
CEO Age	56.7452	6.4137	40.0000	57.0000	77.0000
CEO Duality (Dummy)	0.4788	0.4997	0.0000	0.0000	1.0000
Panel C: Firm Characteristics					
Firm Size (ln Assets)	22.9609	1.6363	18.7632	22.8123	27.3716
Tobin's Q	1.4602	0.9431	0.1511	1.2766	4.9667
ROA	0.0729	0.0509	-0.0250	0.0680	0.2320
Cash-to-Assets Ratio	0.0843	0.0837	0.0014	0.0587	0.4607
Leverage	0.2663	0.1721	0.0000	0.2422	0.9149
Panel D: Deal Specificities					
Relative Deal Value	0.1092	0.2079	0.0002	0.0323	1.3090
Cross-Border (Dummy)	0.3050	0.4605	0.0000	0.0000	1.0000
Same Industry (Dummy)	0.5108	0.5000	0.0000	1.0000	1.0000
Cash Payment (Dummy)	0.5455	0.4981	0.0000	1.0000	1.0000
Stock Payment (Dummy)	0.0535	0.2251	0.0000	0.0000	1.0000
Mixed Payment (Dummy)	0.1307	0.3372	0.0000	0.0000	1.0000
Other Payment (Dummy)	0.2703	0.4422	0.0000	0.0000	1.0000

For the dependent variable, CAR [-1, +1] has an average value of 0.31%, with a median of 0.20%, indicating that acquisition announcements generate, on average, a slightly positive market reaction. Nevertheless, announcement returns exhibit a significant variation, from -14.50% to 15.76%, with a standard deviation of 3.830%, indicating substantial heterogeneity in shareholder value creation across acquisitions. This dispersion supports the empirical question of whether managerial incentives and behavioral characteristics can explain differences in acquisition performance.

Regarding the executive compensation variables, their distributions align with previous literature on equity-based incentives (Core & Guay, 2002). To ensure the economic interpretability of the regression coefficients, the raw values of CEO Delta and Vega were divided by 1,000, therefore expressing them in millions. CEO Delta shows a mean of 1.7041, indicating that, on average, a 1.00% increase in the firm's stock price increases the value of the CEO's equity portfolio by approximately USD 1.70 million. However, the median value is considerably lower at 0.4107, while the maximum reaches 63.6930, indicating a highly right-skewed distribution driven by a relatively small number of CEOs with exceptionally large equity holdings.

Similarly, CEO Vega has a mean of 0.2536, though its median is a considerably lower value, 0.0895. Ranging from 0.0000 to 2.2859, this distribution is also strongly right-skewed, indicating substantial variation regarding the effects of managerial risk-taking incentives across companies.

With respect to managerial characteristics, around 6.07% of CEOs appear to be classified as overconfident using the baseline Holder67 proxy. Consistent with previous behavioral finance studies, this confirms a considerably low proportion of overconfident CEOs, given that managerial overconfidence manifests as the persistent non-exercise of vested in-the-money stock options. Moreover, according to the sample, the average CEO is 56.7 years old, with female CEOs representing only 3.31%, which may reflect a continued underrepresentation of women in senior corporate leadership roles. Furthermore, 47.88% of CEOs simultaneously hold the positions of Chief Executive Officer and Chair of the Board, indicating that CEO duality remains relatively common among U.S. acquiring firms.

Regarding firm characteristics, the average acquiring firm reports a Return on Assets (ROA) of 7.29%, a Cash-to-Assets ratio of 8.43%, and an average Leverage ratio of 26.63%, suggesting that acquisitions are generally undertaken by profitable firms with moderate internal liquidity and moderate debt levels. The mean value of Tobin's Q is 1.4602, indicating

that, in the sample studied, acquiring firms generally have greater growth and investment opportunities before the acquisition announcement. With respect to acquisition characteristics, in the sample, 51.08% of transactions occurred within the same industry, with targets operating within the same Fama-French 48 industry classification as the acquiring firm, while 30.50% are cross-border acquisitions.

Regarding the method of payment, 54.55% of acquisitions are financed exclusively with cash, 5.35% exclusively with stock, 13.07% through mixed consideration, and the remaining 27.03% involve alternative payment structures, indicating that cash-financed transactions remain the dominant acquisition structure within the sample. Overall, the descriptive statistics reveal substantial cross-sectional variation in executive incentives, acquisition characteristics, and shareholder reactions, providing an appropriate setting to examine whether CEO compensation incentives and managerial overconfidence can explain differences in acquisition announcement returns.

4.3.2. Correlation Analysis

Correlation Analysis reports the pairwise Pearson correlation coefficients for the variables that compose the baseline regression models. Overall, the correlation matrix does not indicate substantial multicollinearity among the explanatory variables.

The pairwise correlations are generally moderate, with no economically concerning correlations between the main explanatory variables. This conclusion is consistent with the previous multicollinearity test, in which the VIF analysis, reported in *Appendix F- Table F2*, shows that all VIF values remain comfortably below the commonly accepted thresholds.

As predicted, CEO Delta and CEO Vega are positively correlated, $r = 0.3660, p < 0.01$, highlighting the idea that both incentives are derived from the CEO's equity-based compensation portfolio. However, the degree of correlation is relatively reasonable, providing evidence that the measures still address distinct components of executive compensation and can therefore be included simultaneously in the multivariate analyses.

Among the firm characteristics, firm size is positively correlated with both CEO Delta ($r = 0.1742, p < 0.01$) and CEO Vega ($r = 0.3558, p < 0.01$), indicating that larger firms tend to grant executives stronger equity-based incentives. Likewise, ROA is positively associated with both incentive measures, while Leverage exhibits a weak negative correlation with Delta, $r = -0.0555, p < 0.05$.

Regarding the dependent variables, CAR [-1, +1] displays only weak pairwise correlations with explanatory variables. CEO Vega is negatively correlated with acquisition announcement returns ($r = -0.0514, p < 0.05$), while firm size ($r = -0.1241, p < 0.01$) and Tobin's Q ($r = -0.0306, p > 0.10$) also present modest negative associations with acquisition announcement returns. However, these unconditional relationships do not control the simultaneous influence of CEO characteristics, firm fundamentals, and deal-specific attributes. Consequently, multivariate analysis is required to isolate the independent effects of CEO equity incentives and CEO overconfidence on acquisition announcement returns.

Overall, the correlation analysis suggests that multicollinearity is unlikely to affect the regression estimates and provides preliminary evidence that a multivariate regression analysis is required to isolate the independent effects of CEO equity incentives and CEO overconfidence on acquisition announcement returns.

4.4. Empirical strategy

To assess the impact of managerial incentives and CEO overconfidence on acquirer announcement returns, this dissertation employs multivariate Ordinary Least Squares (OLS) regression models with industry and year fixed effects to test the proposed research hypotheses. Furthermore, this approach uses an acquisition-level dataset with repeated observations for acquiring firms and controls for unobserved time-invariant industry characteristics and periodic macroeconomic shocks. Firm fixed effects are not adopted as the preferred specification because the research hypotheses focus on cross-sectional differences in CEO incentives and behavioral characteristics. Firm fixed effects would absorb much of the between-firm variation of main interest, which would limit the Holder67 measure and executive incentive variables that may exhibit significant consistency within firms.

As a result, industry and year fixed effects are included to control for time-invariant differences across industries and common year-specific shocks. To further account for potential residual correlation when acquiring firms undertake multiple deals, standard errors are consistently clustered at the firm level (Petersen, 2009). This econometric framework relies on baseline models that estimate the direct influence of managerial incentives and CEO overconfidence on acquirer announcement returns, followed by moderating models that include interaction terms to address whether CEO overconfidence moderates the relationship between managerial incentives and acquisition outcomes.

4.4.1. Baseline Regression Models

The baseline empirical models explore the direct effects of managerial incentives (Hypothesis 1) and CEO overconfidence (Hypothesis 2) on acquisition announcement returns. In particular, the analysis comprises the joint effects of alignment incentives (Delta) and risk-taking incentives (Vega) on acquisition performance.

Thus, these baseline regressions assess whether incentive compensation and CEO overconfidence independently influence shareholder value creation in mergers and acquisitions, while controlling for deal, firm, governance, and macroeconomic characteristics. The following OLS regression models are estimated:

Hypothesis 1

$$CAR_{i,t} = \beta_0 + \beta_1 Delta_{i,t-1} + \beta_2 Vega_{i,t-1} + \sum_{k=1}^{n} \gamma_k \, Controls_{i,t-1} + \delta_j + \theta_t + \epsilon_{i,t} \quad (5)$$

For the test of Hypothesis 2, which argues that CEO overconfidence directly impacts acquisition performance through the distortion of managerial risk perception, the baseline model is specified solely using the Holder67 proxy:

Hypothesis 2

$$CAR_{i,t} = \beta_0 + \beta_3 Holder67_{i,t-1} + \sum_{k=1}^{n} \gamma_k \, Controls_{i,t-1} + \delta_j + \theta_t + \epsilon_{i,t} \quad (6)$$

Across all the baseline specifications, $CAR_{i,t}$ represents the cumulative abnormal returns of the acquiring firm i around the acquisition announcement year t, primarily estimated over the three-day event window [-1, +1]. The Vector $Controls_{i,t-1}$ consists of deal, executive, firm, and macroeconomic level control variables, defined previously. To control for unobserved heterogeneity, δ_j represents industry fixed effects based on the Fama-French 48-industry classification, and θ_t denotes year fixed effects. Finally, $\epsilon_{i,t}$ represents the idiosyncratic error term.

4.4.2. Moderating Regression Models

To test Hypothesis 3, which advocates that CEO overconfidence moderates the influence of managerial incentives on acquirer announcement returns, the models are extended to the Holder67 proxy and explicit interaction terms. Hence, these interaction effects are separately tested for Delta and Vega to isolate the moderating role of overconfidence on each incentive component:

Hypothesis 3

$$CAR_{i,t} = \beta_0 + \beta_1 Delta_{i,t-1} + \beta_2 Vega_{i,t-1} + \beta_3 Holder67_{i,t-1} + \beta_4 \left(Delta_{i,t-1} \times Holder67_{i,t-1}\right) + \sum_{k=1}^{n} \gamma_k \, Controls_{i,t-1} + \delta_j + \theta_t + \epsilon_{i,t} \quad (7a)$$

$$CAR_{i,t} = \beta_0 + \beta_1 Delta_{i,t-1} + \beta_2 Vega_{i,t-1} + \beta_3 Holder67_{i,t-1} + \beta_5 \left(Vega_{i,t-1} \times Holder67_{i,t-1}\right) + \sum_{k=1}^{n} \gamma_k \, Controls_{i,t-1} + \delta_j + \theta_t + \epsilon_{i,t} \quad (7b)$$

Within these specifications, the coefficients of main interest are β_4 and β_5 , which captures the moderating effect of the CEO overconfidence proxy on the relationship between managerial incentives and acquirer announcement returns. Therefore, their statistical significance may provide evidence on whether CEO overconfidence alters the relationship between equity incentives and acquisition announcement returns.

4.4.3. Econometric Tests and Model Specification

Prior to estimating the multivariate regression models, several diagnostic tests were conducted to assess the validity of the econometric specification and to determine whether the assumptions underlying the Ordinary Least Squares (OLS) estimation were satisfied, whose results are reported in *Table F2*.

First, multicollinearity was tested using Variance Inflation Factors (VIF). The analysis shows a mean VIF of 1.85, with the highest individual VIF of 2.420 for Tobin's Q. Therefore, since all variables remain below the threshold of 5.0, multicollinearity is not considered a concern, suggesting that the explanatory variables capture different factors of CEO, deal, and firm characteristics.

Second, the Breusch-Pagan test is conducted to assess heteroskedasticity. The test firmly rejects the null hypothesis of homoskedasticity, with $\chi(1)^2 = 4.73$ and $p < 0.0296$, suggesting evidence of heteroskedasticity in the regression residuals (Breusch & Pagan, 1979). Thus, all specifications are estimated using Ordinary Least Squares with standard errors clustered at the acquiring-firm level. Following Petersen (2009), firm-level clustering allows for the standard errors to remain robust to heteroskedasticity and arbitrary within-firm correlation across observations.

Third, the Ramsey RESET test was conducted to address potential model

misspecification due to omitted variables or a neglected non-linear functional form. For the baseline specification with industry and year fixed effects, the test provides evidence of potential functional-form misspecification at the 5% significance level $(F = 4.80, p = 0.0025)$. While the inclusion of industry and year fixed effects may account for substantial unobserved heterogeneity across industries and over time, the RESET result indicates that some residual specification uncertainty cannot be entirely overlooked. This limitation is particularly relevant when acquisition announcement returns may reflect complex, multidimensional market expectations that are difficult to capture with a linear specification. Nevertheless, an alternative specification estimated without fixed effects yields similar main coefficients $(F = 2.15, p = 0.0920)$, providing evidence that the primary findings are not highly sensitive to the inclusion of fixed effects, although some specification uncertainty may remain.

4.4.4. Threats to Identification

Due to the observational characteristic of the dataset, the empirical strategy faces several identification challenges common in executive compensation and empirical corporate finance literature (Roberts & Whited, 2013). Primarily, the models are vulnerable to omitted variable bias, despite the integration of a wide set of observable control variables that account for deal, firm, and managerial factors; acquisition announcement returns can be influenced by other unobservable factors, such as board monitoring quality (Hermalin & Weisbach, 2003), CEO ability, managerial potential and target-specific synergy potential, which can simultaneously influence executive compensation structures (Graham et al., 2012). Therefore, the estimated coefficients may, partially, capture the effect of these unobserved heterogeneous characteristics rather than the isolated effect of managerial incentives or overconfidence.

Reverse causality is also a concern, despite using lagged explanatory variables from the preceding fiscal year, which mitigates the risk that the underlying information in the acquisition announcement determines compensation measures. Corporate boards may still adjust CEO compensation structures in anticipation of future strategic decisions, such as mergers and acquisitions (Berger et al., 1997). Boards planning more aggressive acquisition strategies may deliberately adjust CEO Delta and Vega to optimize risk-taking prior to the deal (Coles et al., 2006); accordingly, while lagging the explanatory variables may reduce this

endogeneity concern, it does not eliminate the possibility of reverse causality.

Furthermore, selection bias represents a potential limitation of empirical design. As is standard in M&A literature, the samples focus solely on completed acquisitions; transactions that fail to close or are later withdrawn are excluded from the analysis (Bhagwat et al., 2016). If transaction completion is systematically related to anticipated market reactions, executive characteristics, expected synergies, and underlying compensation structures, the resulting sample may not be fully representative of the broader population of all announced acquisitions.

As such, the estimated coefficients obtained should be interpreted as conditional associations, not definitive causal effects. The empirical models in this study assess whether managerial incentive structures and CEO overconfidence are associated with variations in acquisition announcement returns, conditional on observable managerial, deal, and firm characteristics. Accordingly, the estimated coefficients should be perceived as conditional associations rather than causal effects.

4.5. Robustness checks

To assess whether the empirical results are not driven solely by the chosen event window, all baseline and moderation regressions were re-estimated using alternative event windows: CAR [-2,+2], CAR [-3,+3], and CAR [-5,+5]. Hence, consistent results across these alternative event windows would indicate that the findings are robust to distinct assumptions about information leakage and market adjustments following acquisition announcements (Mackinlay, 1997).

Beyond these alternative event windows, the empirical strategy also integrates two other robustness checks to validate the main findings under asset-pricing conditions and behavioral measurement sensitivities.

Therefore, to ensure that the estimated cumulative abnormal returns are not attributable to omitted risk factors linked to corporate investment and profitability, the Fama & French (1993)Three-Factor baseline is stress-tested against the Fama & French (2015) Five-Factor Model. The latter is employed as an additional specification because it incorporates profitability and investment factors that the Three-Factor Model does not explicitly capture. Re-estimating expected returns using this framework enables the analysis to assess whether the measured abnormal returns and subsequent regression results are sensitive to the asset-pricing model employed.

Moreover, to ensure that the moderating effect of managerial overconfidence is driven by hubris bias rather than by the baseline proxy's mathematical threshold, a secondary behavioral measure is introduced. The Holder100 proxy consists of a stricter alternative to the Holder67 measure, classifying CEOs as overconfident only when they hold vested options that are at least 100% in-the-money (Malmendier & Tate, 2005). By requiring a higher option-moneyness threshold, the Holder100 proxy identifies CEOs who exhibit more extreme option non-exercise, systematically signaling executives who might delay exercise due to portfolio rebalancing constraints, greater risk tolerance, or even temporary liquidity limitations, thereby isolating managers who display more extreme and persistent optimism.

Lastly, the models were re-estimated without industry and year fixed effects to ensure that the main findings are not materially sensitive to their inclusion. Having established empirical models, estimation procedures, econometric tests, and robustness checks, the following chapter presents the empirical findings, beginning with a description of the sample characteristics and the relationships among the key variables before discussing the regression results.

5. Results and Discussion

This chapter presents the empirical results of this study, first discussing the findings and their implications, and later presenting and assessing the credibility through robustness checks.

5.1. Baseline Regressions

5.1.1. Relationship between managerial incentives and acquirer announcement returns

Table 2 reports the results of the baseline Ordinary Least Squares (OLS) regressions that explore the relationship between CEO equity incentives and acquisition performance, and test H1. Along with the diagnostic tests shown in the previous section, all specifications are estimated with firm-clustered robust standard errors to address heteroskedasticity and within-firm dependence. Moreover, Fama-French 48 industry and year fixed effects are included to control for time-invariant industry factors and macroeconomic effects that can, simultaneously, affect executive compensation and acquisition announcement returns.

The baseline model shows an Adjusted R^2 of 0.0622; although the explanatory power may seem modest relative to conventional corporate finance studies, it is not necessarily unexpected under the context of short-window M&A event-studies, where cumulative abnormal returns are systematically noisy and constrained by a substantial range of market and deal-specific factors (Masulis et al., 2007; Moeller et al., 2005). The model, however, explains around 6% of the cross-sectional variation in acquisition announcement returns using observable deal, executive, and firm characteristics. According to the nature of the dependent variable, the relatively modest Adjusted R^2 should not be strictly considered evidence of model deficiency; instead, the relevance of the specification should be assessed based on the combination of its coefficient stability across alternative specifications, econometric diagnostics, and theoretical motivation.

As represented below, Model (1) estimates the combined influence of CEO Delta and CEO Vega on the three-day cumulative abnormal returns (CAR [-1, +1]), showing that neither incentive measure is statistically significant, since CEO Delta presents a coefficient essentially close to zero, with a coefficient of 0.0001($p = 0.555$); similarly, CEO Vega also fails to show statistical influence on acquirer announcement returns, with a coefficient of -0.0002 ($p = 0.928$). Thus, these findings do not indicate that conventional equity-based compensation incentives directly affect shareholder wealth around the announcement date.

Table 2- Managerial incentives and acquirer announcement returns (H1)

This table reports the baseline OLS regression estimates examining the relationship between managerial incentives and acquirer announcement returns (H1). The dependent variable is the cumulative abnormal return (CAR) measured over the three-day event window [-1,+1]. Standard errors clustered at the firm level are reported in parentheses. Industry and year fixed effects are included in all specifications. Cash payment is the omitted reference payment category. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Variables	**CAR [-1,+1]**
CEO Delta	0.0001
	(0.0001)
CEO Vega	-0.0002
	(0.0027)
Firm Size (ln Assets)	-0.0035***
	(0.0007)
ROA	0.0452
	(0.0300)
Leverage	0.0227***
	(0.0061)
Tobin's Q	-0.0050***
	(0.0016)
Cash-to-Assets Ratio	-0.0112
	(0.0140)
Relative Deal Value	-0.0119
	(0.0084)
Cross-Border	-0.0036*
	(0.0020)
Same Industry	0.0041*
	(0.0022)
Female CEO	-0.0096**
	(0.0039)
CEO Age	0.0001
	(0.0002)
CEO Duality	-0.0012
	(0.0021)
Stock Payment	-0.0122**
	(0.0055)
Mixed Payment	-0.0022
	(0.0040)
Other Payment	-0.0015
	(0.0020)
Constant	0.0893***
	(0.0193)
Industry FE	Yes
Year FE	Yes
Observations	1,813
Adjusted R^2	0.0622

Therefore, Hypothesis 1 is not supported. Rather than confirming an independent effect on acquisition performance, the empirical findings show that managerial incentives alone are insufficient to account for the cross-sectional variation in acquirer announcement returns. These findings may be consistent with the behavioral corporate finance literature; executive compensation may influence corporate decisions when interacting with behavioral characteristics, such as CEO overconfidence. In that sense, the lack of a direct impact enhances the need to examine whether CEO overconfidence moderates the relationship between compensation incentives and acquisition performance, as suggested in Hypothesis 3.

Meanwhile, the key variables of interest are statistically insignificant. Conversely, the control variables demonstrate economically and statistically meaningful results ($p < 0.01$), thereby ensuring the validity of the empirical specification. Firm size (ln_assets) findings exhibit statistically significant and consistently negative returns ($-0.0035, p < 0.01$), aligning with the well-documented "size effect" in the mergers and acquisitions context, which holds that larger firms tend to generate lower abnormal returns than smaller firms (Moeller et al., 2004). Accordingly, Tobin's Q shows a statistically significant negative coefficient ($-0.0041, p < 0.10$), leading to less favorable announcement market reactions, since investors may perceive these transactions as overinvestment or as an exercise of growth expectations. Moreover, acquisitions within the same Fama-French industry classification seem to generate higher abnormal returns ($0.0041, p < 0.10$), consistent with the argument that related acquisitions are more prone to provide operational synergies and lower post-merger integration costs (Berger & Ofek, 1995; Servaes, 1991).

The payment method also displays relevant information. In contrast, mixed-payment transactions do not differ substantially from cash deals, and stock-financed deals associated with announcement returns that are approximately 1.22% lower than comparable cash-financed deals ($-0.0122, p < 0.05$), supporting the asymmetric information theory of Myers & Majluf (1984), which argues that equity-financed acquisitions signal acquiring firms' overvaluation. Hence, the baseline analysis suggests that acquisition announcement returns are mainly fostered by deal and firm characteristics rather than by managerial incentives, CEO Delta, and CEO Vega. The following section analyses whether the effectiveness of managerial incentives is dependent on CEO overconfidence.

5.1.2. The effect of CEO Overconfidence on acquirer announcement returns

Table 3 reports the estimation results of Hypothesis 2, which explores the influence of CEO overconfidence on shareholder wealth around acquisition announcements. For this purpose, CEO overconfidence is captured using the Holder67 proxy proposed by Malmendier & Tate (2005, 2008). This specification includes the control variables from the first regression, industry and year fixed effects, and robust standard errors clustered at the firm level, and contains a consistent Adjusted R^2 of 0.0641

Table 3- CEO Overconfidence and Acquirer Announcement Returns (H2)

This table reports the OLS regression estimates examining the relationship between CEO overconfidence and acquirer announcement returns (H2). The dependent variable is the cumulative abnormal return (CAR) measured over the three-day event window [-1,+1]. Standard errors clustered at the firm level are reported in parentheses. Industry and year fixed effects are included in all specifications. Cash payment is the omitted reference payment category. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Variables	**CAR [-1,+1]**
CEO Overconfidence	-0.0000
	(0.0043)
Firm Size (ln Assets)	-0.0030***
	(0.0007)
ROA	0.0501
	(0.0328)
Leverage	0.0215***
	(0.0063)
Tobin's Q	-0.0062***
	(0.0017)
Cash-to-Assets Ratio	-0.0044
	(0.0153)
Relative Deal Value	-0.0134
	(0.0094)
Cross-Border	-0.0026
	(0.0022)
Same Industry	0.0051**
	(0.0023)
Female CEO	-0.0103**
	(0.0041)
CEO Age	0.0000
	(0.0002)
CEO Duality	-0.0010
	(0.0022)
Stock Payment	-0.0096
	(0.0065)
Mixed Payment	-0.0027
	(0.0044)
Other Payment	-0.0022
	(0.0022)
Constant	0.0787***
	(0.0204)
Industry FE	Yes
Year FE	Yes
Observations	1,515
Adjusted R^2	0.0641

Based on the results, the coefficient on Holder67 is negative, although economically small and statistically insignificant, with a coefficient of -0.0000 $(p = 0.991)$, indicating that acquisitions undertaken by overconfident CEOs do not, on average, create substantially distinct announcement returns from those by non-overconfident managers. Therefore, Hypothesis 2 is not supported. Despite seeming inconsistent with Roll's (1986) hubris hypothesis, these results align with Malmendier and Tate (2005, 2008), who argue that CEO overconfidence does not necessarily decrease acquisition performance in all circumstances. In fact, these effects are constrained by the firm's financial context and the discretion available to executives. In particular, overconfident executives are more likely to pursue value-destroying acquisitions when substantial internal resources or limited external monitoring enable them to pursue excessively optimistic investment opportunities.

Regarding the control variables, these display patterns consistent with the baseline specification. Firm size continues to exhibit a negative effect on announcement returns (-0.0030, $p < 0.01$. Similarly, Tobin's Q remains statistically significant, with a negative coefficient $(-0.0062,\ p < 0.01$, reinforcing the idea that markets react negatively to large firms' acquisition announcements. Finally, industry-related target acquisitions also seem to generate higher abnormal returns. As a result, these findings support the validity of the empirical specification. Although the RESET test indicates residual specification uncertainty, the stability of the key coefficients across alternative specifications provides additional evidence that the baseline functional form does not solely drive the main findings.

The absence of a statistically significant direct impact indicates that CEO overconfidence, by itself, does not elicit a market reaction to acquisition announcements. However, behavioral biases may still influence shareholder value when interacting with other companies or managerial specificities. Therefore, supporting the relevance of exploring whether the effectiveness of executive compensation incentives depends on the existence of CEO overconfidence, which is described in the subsequent analysis.

5.2. The CEO's overconfidence moderating role on managerial incentives

Table 4 presents the regression results for Hypothesis 3, which explores whether CEO overconfidence moderates the relationship between equity-based managerial incentives and acquirer announcement returns. Thus, two distinct interaction models are estimated separately, allowing CEO overconfidence to interact with Delta and Vega, respectively.

Table 4- CEO Overconfidence as a Moderator of Managerial Incentives and CARs (H3)

This table reports the OLS regression estimates examining whether CEO overconfidence moderates the relationship between managerial incentives (Delta and Vega) and acquirer announcement returns (H3). The dependent variable is the cumulative abnormal return (CAR) measured over the three-day event window [-1, +1]. Standard errors clustered at the firm level are reported in parentheses. Industry and year fixed effects are included in all specifications. Cash payment is the omitted reference payment category. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively

Variables	**Delta Model**	**Vega Model**
CEO Delta	-0.0001	-0.0001
	(0.0002)	(0.0002)
CEO Vega	0.0014	0.0009
	(0.0031)	(0.0032)
CEO Overconfidence	-0.0008	-0.0039
	(0.0042)	(0.0049)
CEO Delta × Overconfidence	0.0003	
	(0.0005)	
CEO Vega × Overconfidence		0.0125*
		(0.0069)
Firm Size (ln Assets)	-0.0032***	-0.0032***
	(0.0008)	(0.0008)
ROA	0.0503	0.0509
	(0.0331)	(0.0329)
Leverage	0.0217***	0.0218***
	(0.0064)	(0.0064)
Tobin's Q	-0.0062***	-0.0062***
	(0.0017)	(0.0017)
Cash-to-Assets Ratio	-0.0042	-0.0039
	(0.0153)	(0.0153)
Relative Deal Value	-0.0134	-0.0133
	(0.0094)	(0.0094)
Cross-Border	-0.0026	-0.0026
	(0.0022)	(0.0022)
Same Industry	0.0052**	0.0052**
	(0.0023)	(0.0023)
Female CEO	-0.0106***	-0.0105***
	(0.0040)	(0.0040)
CEO Age	0.0000	0.0000
	(0.0002)	(0.0002)
CEO Duality	-0.0011	-0.0012
	(0.0022)	(0.0022)
Stock Payment	-0.0095	-0.0095
	(0.0065)	(0.0065)
Mixed Payment	-0.0028	-0.0028
	(0.0045)	(0.0045)
Other Payment	-0.0023	-0.0023
	(0.0022)	(0.0022)
Constant	0.0804***	0.0810***
	(0.0223)	(0.0222)
Industry FE	Yes	Yes
Year FE	Yes	Yes
Observations	1,515	1,515
Adjusted R^2	0.0624	0.0630

Regarding the first specification, it examines whether CEO overconfidence can influence the effect of executive pay-performance sensitivity (CEO Delta) on acquisition performance. This interaction term between CEO Delta and the Holder67 proxy (delta_holder) exhibits statistical insignificance with a coefficient of 0.0003 ($p = 0.500$), meaning that the effectiveness of CEO Delta is not likely to depend on the CEO's behavioral traits. Thus, there is no evidence supporting the argument that overconfidence strengthens or mitigates the alignment effect created by performance-sensitive compensation. Unlike traditional agency conflicts, overconfident executives do not deliberately pursue self-interest at shareholders' expense; rather, they sincerely believe their investment decisions maximize firm value (Malmendier & Tate, 2005). Thereby, increasing pay-performance sensitivity incentives through Delta may have a limited impact on their acquisition decisions, since they already perceive their actions as aligned with shareholder value maximization.

The second specification investigates whether CEO overconfidence moderates the relationship between risk-taking incentives embedded in executive compensation and acquisition announcement returns. Unlike the previous model, the interaction between CEO Vega and Holder67 has a positive coefficient of 0.0125 and is statistically significant at the 10% level ($p = 0.070$). However, this evidence should be interpreted with caution, given the observational design and the sensitivity of statistical significance to alternative windows. As such, it is necessary to evaluate the marginal association between risk-taking incentives and acquisition announcement returns conditional on CEO behavioral characteristics.

For non-overconfident CEOs, the marginal association between CEO Vega and CARs is merely given by the baseline coefficient on Vega. In contrast, for overconfident CEOs, this marginal relationship corresponds to the sum of the baseline coefficient on Vega and the interaction coefficient. Hence, the positive interaction coefficient indicates that the association between Vega and acquisition announcement returns is 0.0125 higher than for overconfident CEOs compared to non-overconfident CEOs, conditional on the remaining variables. More particularly, for non-overconfident CEOs the estimated marginal association between Vega and CAR is 0.0009, compared to 0.0134 for overconfident CEOs, obtained by summing the coefficient on Vega and the interaction coefficient. Despite the interaction term indicating that the marginal effect on Vega is substantially more positive for overconfident CEOs, a subsequent linear combination test reveals that the total marginal association for this subsection is not statistically distinguishable from zero ($p = 0.251$) in absolute terms.

Therefore, while CEO overconfidence alters the market's reception of risk-taking incentives, the combined effect does not guarantee positive absolute returns.

Such findings broadly align with theoretical arguments, proposing that managerial risk-taking incentives and behavioral traits may complement one another. While Goel & Thakor (2008) suggest that convex compensation contracts encourage managers to pursue risky opportunities that diversified shareholders would prefer, Gervais et al. (2011) propose that moderate overconfidence may decrease excessive managerial conservatism. In fact, under the acquisitions framework, the results suggest that the combination of higher Vega and CEO overconfidence may somewhat offset managerial underinvestment in risky but value-enhancing deals.

Still, this evidence should be interpreted with caution, since the interaction remains significant at the 10% level, providing only suggestive, not conclusive, support for the moderating role of CEO overconfidence. Additionally, the baseline regressions are described in Section 5.1.1. and 5.1.2. show that neither managerial incentives nor overconfidence can explain acquisition announcement returns independently. Instead, the findings reveal that behavioral characteristics become economically significant only when considered alongside the structure of executive compensation. Thus, the results provide partial support for Hypothesis 3. At the same time, CEO overconfidence does not moderate the effect of CEO Delta; there is slight evidence that it positively moderates the relationship between CEO Vega and acquisition announcement returns, indicating that behavioral biases may influence how managerial incentive contracts affect acquisition performance.

5.3. Robustness checks

Despite having estimated and discussed the baseline and moderation regressions, there is a need to understand if these findings are sensitive to alternative empirical measures. Thus, several robustness tests were conducted by replicating the models using alternative event windows, estimating abnormal returns using the Fama-French Five-Factor Model, and including a more restrictive measure of CEO overconfidence (Holder100). Additionally, the models were re-estimated without industry and year fixed effects to understand the sensitivity of the results to the preferred regression specification. Overall, these tests assess whether the primary conclusions remain steady across different modeling choices and provide additional confidence in the validity of the empirical results.

5.3.1. Alternative Event Windows

Though the baseline analysis estimates acquisition performance relying on the three-day event window (CAR [-1, +1]), often used in the M&A literature since it captures the immediate market reaction, reducing contamination from unrelated events, to confirm whether this specification of the event window does not determine the results, Table 5 includes the baseline regressions re-estimated using increasingly wider windows: CAR [-2, +2], CAR [-3, +3], and CAR [-5, +5]; full results are presented in *Appendix G*.

Table 5- Alternative Event Windows- Robustness Test 1

This table reports the robustness tests for the baseline models using alternative event windows to calculate cumulative abnormal returns (CAR). The dependent variable is the cumulative abnormal return (CAR) measured over the event windows [-2,+2], [-3, +3], and [-5, +5]. Standard errors clustered at the firm level are reported in parentheses. Industry and year fixed effects are included in all specifications.

Variables	CAR [-2,+2]	CAR [-3,+3]	CAR [-5,+5]
Managerial Incentives (H1)			
CEO Delta	0.0001	0.0000	0.0001
	(0.0001)	(0.0001)	(0.0002)
CEO Vega	-0.0007	-0.0002	-0.0026
	(0.0029)	(0.0028)	(0.0032)
Controls	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	1,813	1,813	1,813
Adjusted R^2	0.0493	0.0398	0.0229
CEO Overconfidence (H2)			
CEO Overconfidence	0.0020	0.0010	-0.0001
	(0.0051)	(0.0057)	(0.0063)
Controls	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	1,515	1,515	1,515
Adjusted R^2	0.0484	0.0341	0.0172
Delta Moderation (H3a)			
CEO Delta	-0.0001	-0.0002	-0.0000
	(0.0002)	(0.0002)	(0.0002)
CEO Vega	0.0014	0.0008	-0.0023
	(0.0034)	(0.0036)	(0.0040)
CEO Overconfidence	0.0017	0.0002	0.0012
	(0.0051)	(0.0057)	(0.0063)
CEO Delta × Overconfidence	0.0001	0.0004	-0.0005
	(0.0005)	(0.0006)	(0.0005)
Controls	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	1,515	1,515	1,515
Adjusted R^2	0.0466	0.0334	0.0155
Vega Moderation (H3b)			
CEO Delta	-0.0001	-0.0002	-0.0000
	(0.0002)	(0.0002)	(0.0002)
CEO Vega	0.0010	0.0001	-0.0023
	(0.0035)	(0.0036)	(0.0040)
CEO Overconfidence	-0.0016	-0.0052	-0.0009
	(0.0062)	(0.0068)	(0.0078)
CEO Vega × Overconfidence	0.0114	0.0202*	0.0033
	(0.0093)	(0.0115)	(0.0146)
Controls	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	1,515	1,515	1,515
Adjusted R^2	0.0470	0.0335	0.0154

Across all estimation windows, the estimated coefficients for both CEO Delta and CEO Vega remain statistically insignificant. For instance, within the widest specification CAR [-5, +5], neither CEO Delta ($0.0001, p = 0.498$) or CEO Vega ($-0.0026, p = 0.423$) show a significant relationship with acquirer announcement returns. Thus, the stability of these results suggests that the lack of a direct relationship between managerial equity incentives and shareholder wealth creation is not driven by the selected event window. Accordingly, the empirical results continue to support the argument that traditional compensation incentives alone do not explain cross-sectional differences in acquisition performance.

For the moderation regression, the interaction term between CEO Delta and CEO overconfidence remains statistically insignificant for all the alternative event windows, with a distinct economic effect for the widest specification, CAR [-5, +5], with a negative coefficient ($-0.0005, p = 0.852$). Despite the marginal change in the coefficient, the results remain consistent with the baseline finding and indicate that the absence of a statistically significant Delta moderation effect is not dependent on the preferred event window.

The results for the CEO Vega interaction, however, show a distinct difference compared to the main specification, although the coefficient holds positive across all alternative windows, ranging from 0.0033 and 0.0202, the statistical significance seems to be sensitive to the different alternative windows. Whereas it is marginally significant at the 10% significance level for CAR [-3, +3], ($0.0202, p = 0.080$) , it loses statistical significance for both CAR [-2, +2] and CAR [-5, +5]. This pattern suggests that the positive association between CEO Vega and acquisition announcement returns conditioned by CEO overconfidence holds steady when the event window is changed, despite its statistical significance being sensitive to the length of the event window.

Such behavior might be explained due to the fact that wider event windows capture a larger information set and wider market movements surrounding the acquisition announcement, meaning that as the event window expands, abnormal returns may increasingly retain information unrelated to the acquisition announcement, likely introducing additional noise to the dependent variable.

5.3.2. Alternative Asset-Pricing Model: Fama-French Five-Factor Model

Secondly, Table 6 demonstrates the results for a robustness analysis conducted to assess whether the findings depend on the expected-return model used in the event study. While the baseline cumulative abnormal returns are estimated using the Fama-French three-factor model, the regressions were replicated using abnormal returns computed via the Fama & French (2015) five-factor mechanism, which additionally accounts for profitability (RMW) and investment (CMA); full results can be seen in *Appendix H – Table H1.*

Table 6- Fama-French Five-Factor CARs - Robustness Test 2

This table reports the robustness tests using cumulative abnormal returns estimated from the Fama-French five-factor model. The dependent variable is the cumulative abnormal return (CAR) measured over the three-day event window [-1,+1]. Standard errors clustered at the firm level are reported in parentheses. Industry and year fixed effects are included in all specifications. Cash payment is the omitted reference payment category. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Variables	Managerial Incentives (H1)	CEO Overconfidence (H2)	Delta Moderation (H3a)	Vega Moderation (H3b)
CEO Delta	0.0001		-0.0001	-0.0000
	(0.0001)		(0.0002)	(0.0002)
CEO Vega	-0.0005		0.0011	0.0007
	(0.0027)		(0.0032)	(0.0032)
CEO Overconfidence (Holder67)		0.0001	-0.0006	-0.0032
		(0.0043)	(0.0041)	(0.0048)
CEO Delta × Overconfidence			0.0003	
			(0.0005)	
CEO Vega × Overconfidence				0.0106
				(0.0067)
Controls	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	1,813	1,515	1,515	1,515
Adjusted R^2	0.0567	0.0592	0.0574	0.0578

The findings seem qualitatively aligned with the baseline results, with the direct effects of CEO Delta, CEO Vega, and CEO overconfidence remaining statistically insignificant. Likewise, the interaction between CEO Vega and CEO overconfidence still shows a positive coefficient close to that detected in the baseline specification with a coefficient of 0.0106. However, the interaction is not statistically significant at the 10% level under the five-factor estimation ($p = 0.114$).

According to the Fama-French five-factor model, the construction of abnormal returns introduces two additional dimensions by accounting for profitability and investment factors; therefore, a part of the return variation is attributed to these additional systematic risk dimensions. As such, this may lead to the observed decrease of statistical significance

for the interaction term, indicating that the statistical robustness of the model is somewhat sensitive to the asset-pricing benchmark.

Generally, these results provide supportive evidence that the estimated moderating relationship may be marginally driven by the choice of asset-pricing model used to compute abnormal returns. Nevertheless, the sustained robustness of the coefficient's magnitude, the absence of statistical significance, even if marginal, suggests that the underlying economic relationship is not fully consistent across alternative event-study methodologies.

5.3.3. Alternative Measure for CEO Overconfidence: Holder100

The third robustness check reported in Table 7 concerns the CEO overconfidence Holder67 proxy, and replaces it with a more restrictive measure, Holder100. Under this specification, CEOs are classified as overconfident only if they systematically retain stock options that are at least 100% in-the-money before exercise. This proxy identifies a significantly reduced subset of executives, thus capturing a more persistent and excessive form of managerial overconfidence; the full results are discussed in *Appendix H* and presented in *Table H2*.

Table 7- Alternative CEO Overconfidence Proxy - Robustness Test 3

This table reports robustness checks using the Holder100 proxy for CEO overconfidence instead of Holder67. The dependent variable is the cumulative abnormal return (CAR) measured over the three-day event window [-1, +1]. Standard errors clustered at the firm level are reported in parentheses. Industry and year fixed effects are included in all specifications. Cash payment is the omitted reference category for payment. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Variables	CEO Overconfidence (H2)	Delta Moderation (H3a)	Vega Moderation (H3b)
CEO Overconfidence (Holder100)	-0.0002	-0.0002	-0.0042
	(0.0041)	(0.0042)	(0.0049)
CEO Delta		-0.0001	-0.0001
		(0.0002)	(0.0002)
CEO Vega		0.0013	0.0009
		(0.0031)	(0.0032)
CEO Delta × Overconfidence		-0.0000	
		(0.0002)	
CEO Vega × Overconfidence			0.0118*
			(0.0068)
Controls	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Observations	1,515	1,515	1,515
Adjusted R^2	0.0641	0.0622	0.0629

Consistent with the baseline results, the Holder100 measure does not show a statistically significant direct effect on acquirer announcement returns. Moreover, the interaction between CEO Vega and Holder100 remains positive and statistically significant at the 10%

significance level, with a coefficient of 0.0118. This is a particularly strong result given that the stricter classification of the proxy, which significantly reduces the number of CEOs considered overconfident, ultimately reduces the statistical power of the test. Nevertheless, the interaction coefficient remains economically positive and comparable in magnitude to the baseline estimates. This similarity provides supportive evidence that the specific mathematical threshold of the behavioral proxy does not drive the moderating relationship between convex-compensation executive incentives and CEO overconfidence.

5.3.4. Alternative Specification: Excluding Fixed Effects

Given the possible model misspecification noted in the methodology chapter, the baseline and moderation models were re-estimated without industry and year fixed effects. The subsequent coefficients of the main explanatory variables presented in *Appendix G* remain highly consistent with those obtained under the primary specification, indicating that the main results are not unique, a consequence of model misspecification caused by high-dimensional dummy variables. However, the fixed-effects model is retained as the preferred and primary model throughout this research, given its theoretical relevance for controlling unobserved industry-specific heterogeneity and common time-varying macroeconomic shocks.

Lastly, the results are broadly consistent across the distinct alternative specifications, with the positive economic relationship between Vega and CEO overconfidence remaining stable, although statistical significance is not preserved for all event windows. The direct effects of CEO Delta and CEO Vega on acquisition announcement returns are robust across alternative event windows and asset-pricing models. With respect to the moderating models, the economic magnitude and positive sign of the interaction between CEO Vega and overconfidence are highly stable across methodologies. However, the interaction remains positive across alternative windows; its statistical significance is not consistently maintained in the wider intervals. Conversely, the positive interaction continues statistically significant when abnormal returns are estimated using the Fama-French five-factor model and when the stricter Holder100 proxy is employed.

Therefore, these empirical results, further presented in *Appendix J*, provide evidence that the main conclusions are not driven by a particular methodological choice, reinforcing the credibility of the findings and the perspective that behavioral traits moderate the effectiveness of risk-taking incentives.

6. Conclusion

This dissertation explores the relationship between CEO compensation incentives, managerial overconfidence, and shareholder value creation in mergers and acquisitions. Building on the growing behavioral corporate finance literature, this research aimed to determine whether traditional incentive mechanisms remain sufficient to justify acquisition performance or whether their effectiveness relies on managerial psychological traits. Using a baseline sample of 1,813 U.S. acquisition announcements completed between 2009 and 2020, this study estimates cumulative abnormal returns using an event-study methodology. Further, it employs pooled Ordinary Least Squares (OLS) regressions with firm clustering and robust standard errors, alongside industry and year fixed effects, to evaluate the suggested hypotheses.

According to empirical evidence, there is no support for a direct relationship between executive equity incentives and acquisition announcement returns. Neither CEO Delta, which represents pay-for-performance sensitivity, nor CEO Vega, which captures risk-taking incentives, exhibits a statistically significant direct influence on cumulative abnormal returns. Similarly, CEO overconfidence, estimated using the Holder67 option-based proxy, does not independently explain market reactions to acquisition announcements. Thus, these results indicate that incentive alignment, risk-taking incentives, and managerial overconfidence alone are insufficient to drive the significant heterogeneity observed in short-term acquisition outcomes.

Therefore, the main empirical contribution of this dissertation arises from the interaction between managerial incentives and behavioral characteristics. While the interaction between CEO Delta and overconfidence remains statistically insignificant, the interaction between CEO Vega and overconfidence is positive and statistically significant at the 10% level in the baseline specification. Furthermore, this interaction remains consistent, preserving its economic magnitude with the coefficient remaining strongly consistent across alternative asset-pricing models and stricter behavioral proxies (Holder100). This observed outcome suggests that the association between convex compensation incentives and acquisition announcement returns varies with the behavioral traits of the executive receiving them, reinforcing the argument that compensation contracts and managerial behavior should be jointly assessed rather than independently. Accordingly, the results go beyond expectations in traditional agency theory by providing evidence that behavioral biases may condition how executives respond

to risk-taking incentive structures.

On the one hand, these empirical findings add to existing literature by integrating insights from agency theory and behavioral corporate finance. While classical agency models argue that compensation contracts invariably affect the decisions of fully rational managers, the current evidence indicates that executives' intrinsic behavioral characteristics actively moderate the effectiveness of those incentives. Specifically, the results show that the interaction between compensation design and CEO overconfidence provides a more nuanced understanding of acquisition outcomes than either factor alone. This supports the growing body of literature indicating that a comprehensive understanding of corporate acquisition decisions requires integrating economic incentives with managerial psychological traits.

On the other hand, from a practical perspective, these findings yield significant implications for several corporate stakeholders. For corporate boards and remuneration committees, the results suggest that optimal executive compensation design should not be based solely on universal financial targets; it must actively account for executives' behavioral profiles. More specifically, remuneration committees should be highly cautious when granting substantially greater convex option-based compensation to CEOs who exhibit systematic signs of overconfidence, as this behavioral trait seems to amplify the intended effects of incentive contracts. Similarly, investors may benefit from aggregating managerial behavioral characteristics into their assessment of acquisition announcements alongside traditional governance factors. Overall, the findings contribute to the ongoing debate on executive compensation and governance structures by suggesting that identical incentive structures may yield distinct corporate outcomes depending on the CEOs' behavioral profile.

Despite these contributions, several limitations must be acknowledged. First, CEO overconfidence is fundamentally unobservable. Thus, it must be approximated using behavioral proxies based upon option exercise behavior, which may not perfectly capture the complexity of managerial optimism.

Second, cumulative abnormal returns measure investors' immediate perception of acquisition announcements rather than the actual long-term success of completed transactions. Consequently, rather than being perceived as post-merger performance, the results should reflect the expected value creation at the announcement date. Moreover, the empirical analysis is constrained by data availability, covering only the period from 2009 to 2020, which prevents the inclusion of more recent transactions and the assessment of whether these relationships remain persistent under the current economic and corporate governance

framework.

Lastly, the sample comprises publicly listed U.S. firms that undertake relatively large acquisitions. As a result, the findings may not generalize to smaller firms, private companies, or even acquisitions of lower economic significance, where managerial incentives and behavioral traits may influence decision-making in distinctive ways.

Further research could expand this analysis by including alternative measures of CEO overconfidence, such as media-based indicators, earnings forecast behavior, machine-learning approaches, or textual analysis of executive communications, providing a more comprehensive assessment of this behavioral factor. Second, extending the analysis over a longer timeframe would allow researchers to evaluate whether the documented relationship remains consistent in the post-2020 corporate environment. Finally, future studies could focus on smaller firms or acquisitions, explore the same effects across different geographical and cultural contexts, and examine the long-term consequences of executive incentives and managerial overconfidence by analyzing post-merger operating performance, synergy realization, or long-term stock performance, completing the empirical findings examined in this dissertation.

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Appendix

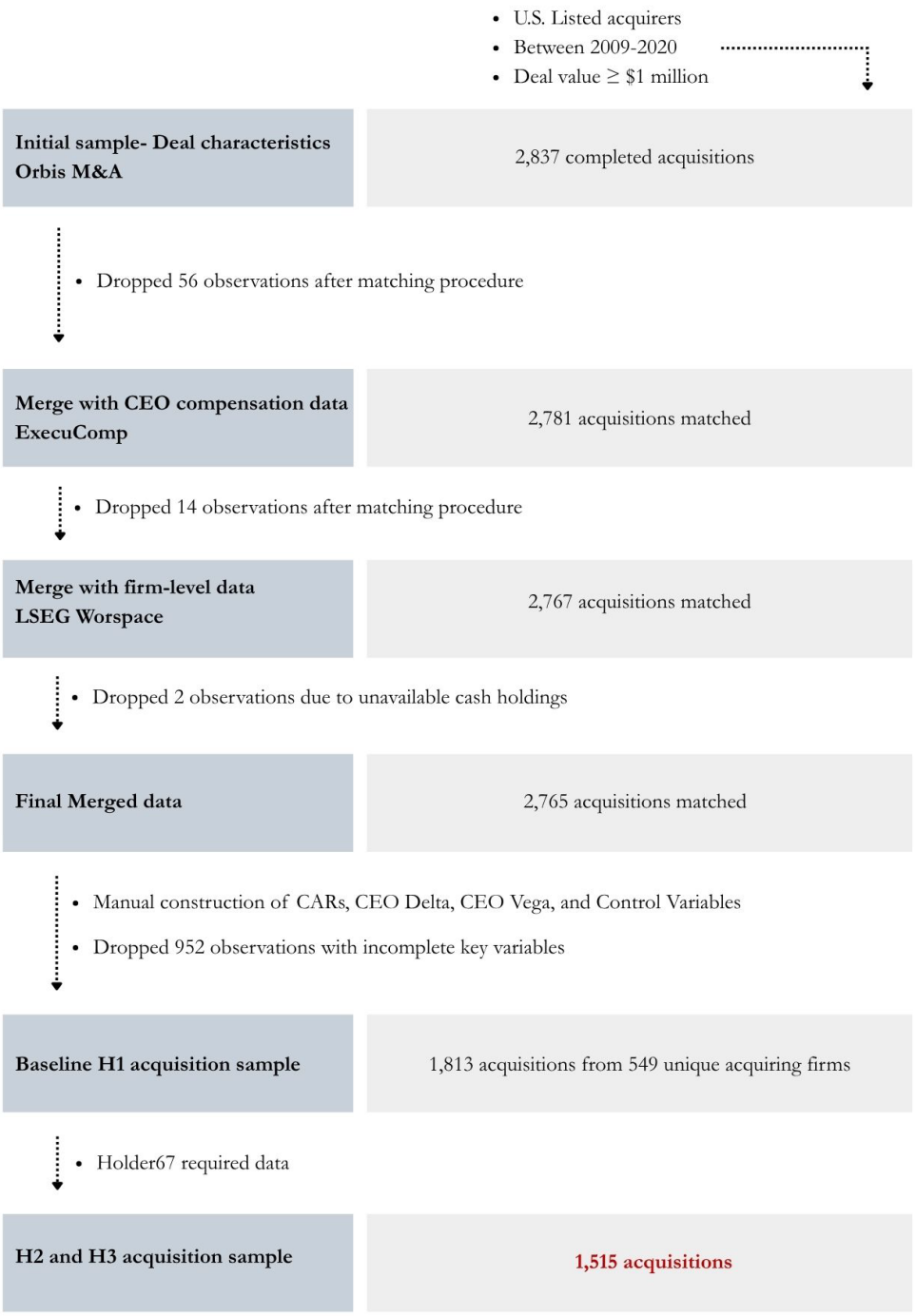
Appendix A – Variables Description

Table A- Variable definition and measurement

Variable	Description	Construction	Data provider
Dependent Variables			
CAR [-1,+1]	3-day cumulative abnormal return	Sum of daily abnormal returns over the window [-1, +1].	Own calculation
CAR [-2,+2]	5-day cumulative abnormal return	Sum of daily abnormal returns over the window [-2, +2].	Own calculation
CAR [-3,+3]	7-day cumulative abnormal return	Sum of daily abnormal returns over the window [-3, +3].	Own calculation
CAR [-5,+5]	11-day cumulative abnormal return	Sum of daily abnormal returns over the window [-5, +5].	Own calculation
Independent and Moderating Variables			
CEO Delta	Sensitivity of CEO wealth to stock price	Change in the dollar value of the CEO's equity portfolio for a 1% change in stock price.	Core & Guay (2002) & ExecuComp
CEO Vega	Sensitivity of CEO wealth to return volatility	Change in the dollar value of the CEO's equity portfolio for a 1% change in annualized stock return volatility.	Core & Guay (2002) & ExecuComp
Holder67	CEO overconfidence dummy	Takes the value of 1 if the CEO holds exercisable options at least 67% in-the-money, and 0 otherwise.	Malmendier & Tate (2005) & ExecuComp
Holder100	Alternative overconfidence measure	Takes the value of 1 if the CEO holds exercisable options at least 100% in-the-money, and 0 otherwise.	Malmendier & Tate (2005) & ExecuComp
Firm Characteristics			
Firm Size (ln Assets)	Natural logarithm of firm size	ln(Total Assets)	LSEG Workspace
ROA	Return on Assets	Net income divided by total assets.	LSEG Workspace
Leverage	Firm indebtedness	Total debt divided by total assets.	LSEG Workspace
Cash-to-Assets Ratio	Cash holdings ratio	Cash and short-term investments divided by total assets.	LSEG Workspace
Tobin's Q	Proxy for growth opportunities	(Market value of equity + book value of debt) / total assets.	LSEG Workspace
Deal Characteristics			
Relative Deal Value	Relative size of the acquisition	Deal Value/Firm Size	Orbis M&A
Cross-border	International transaction dummy	Takes the value of 1 if the target is non-U.S., and 0 otherwise.	Orbis M&A
Same Industry	Industry relatedness dummy	Takes the value of 1 if acquirer and target share the same Fama-French 48 industry, and 0 otherwise.	Orbis M&A & FF48 Industry Classification
Cash Payment	Cash consideration dummy	Takes the value of 1 if the acquisition is financed exclusively with cash, and 0 otherwise.	Orbis M&A
Stock Payment	Equity consideration dummy	Takes the value of 1 if the acquisition is financed exclusively with stock, and 0 otherwise.	Orbis M&A
Mixed Payment	Mixed consideration dummy	Takes the value of 1 if the acquisition is financed with a combination of cash and stock, and 0 otherwise.	Orbis M&A
Other Payment	Alternative consideration dummy	Takes the value of 1 if the transaction is financed with other structures, and 0 otherwise.	Orbis M&A
Executive Characteristics			
Female CEO	CEO gender dummy	Takes the value of 1 if the CEO is female, and 0 if male.	ExecuComp
CEO Age	Age of the CEO	Age of the Chief Executive Officer in years.	ExecuComp
CEO Duality	CEO-chair duality dummy	Takes the value of 1 if the CEO simultaneously holds the title of Chairman of the Board, and 0 otherwise.	ExecuComp

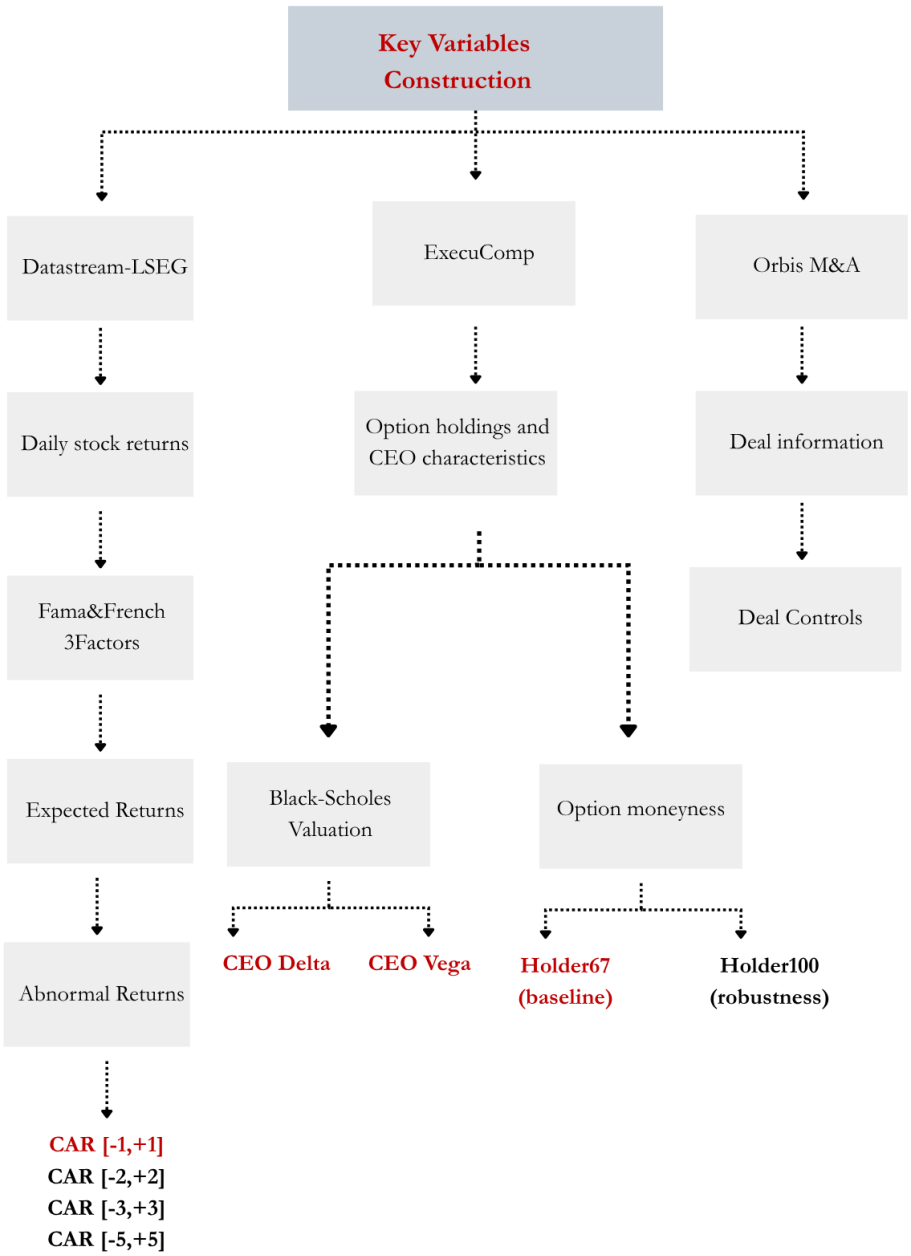
Appendix B- Sample Selection and Data Matching workflow

Figure B1 – Data collection and Matching workflow



This workflow represents the sequential data collection and merging process employed to build the final estimation samples, starting from the initial sample with acquisitions' data from Orbis M&A.

Figure B2- Key Variables estimation framework



The flowchart above concerns the integration of the raw data from Datastream-LSEG, ExecuComp, and Orbis M&A and the following process of estimation until the final constructed variables used in the empirical regression models.

Appendix C- Estimation of CEO Delta and Vega

Instead of relying on the reconstruction of complete historical option portfolios, the measurement of CEO equity incentives is based on the one-year approximation method developed by Core & Guay (2002). The methodology implemented during this study estimates the sensitivities of managers' equity holdings using current-year option data from ExecuComp and the dividend-adjusted Black-Scholes option pricing model.

To calculate option sensitivities, the model integrates the following components for each firm year observation:

- Stock price (S)- The fiscal year-end stock price.
- Exercise price (K)- For newly granted options, the exercise price is directly obtained from ExecuComp, whereas for previously granted options, the exercise price is estimated from the option portfolio's realizable value and number of options, based on the fiscal year-end stock price:

$$K = S - \frac{Realizable\ Value}{Number\ of\ Options}$$

- Time to Maturity (T): Following a simplified implementation of the Core & Guay (2002) methodology, the time to maturity of newly granted options is set to 9 years, for previously granted unexercisable options it is set to 6 years, and for previously granted exercisable options it is set to 3 years.
- Volatility (σ): The annual standard deviation of the firm's daily stock returns over the 60 months preceding the fiscal year-end.
- Dividend Yield (q): The annualized dividend yield, expressed as a decimal.
- Risk-Free Rate (r): U.S. Treasury yield corresponding to the estimated maturity of the respective option portfolio.

Delta captures the sensitivity of an option's value to a 1% change in the underlying stock price, and the Delta of a single option is calculated as:

$$\Delta = e^{-dT}\, N(d_1)\, \frac{S}{100},$$

Where (N) represents the cumulative standard normal distribution and:

$$d_1 = \frac{\ln\left(\frac{S}{K}\right) + \left(r - q + \frac{\sigma^2}{2}\right)T}{\sigma\sqrt{T}}$$

As such, the Delta employed represents the estimated dollar change in the value of a single option associated with a 1% change in the underlying stock price.

On the other hand, Vega measures the sensitivity of an option's value to a 1% change in annualized stock return volatility, and the Vega of a single option is calculated as:

$$v = Se^{-qT}\sqrt{T}N'(d_1),$$

Where $N'(d_1)$ represents the standard normal probability density function.

Therefore, the estimated Vega captures the estimated dollar change in the value of a single option associated with a 1% change in the annualized stock-return volatility.
Since CEO wealth may be dependent on several equity instruments, option-level sensitivities are integrated to obtain portfolio measures of equity sensitivities. Therefore, for each option portfolio j, the aggregate Delta is measured as:

$$\Delta_j^{CEO} = \Delta_j^{option} \times Number\ of\ options_j,$$

and the aggregate Vega is calculated as:

$$v_j^{CEO} = v_j^{option} \times Number\ of\ options_j$$

Furthermore, the total CEO Delta is estimated by adding the sensitivity of the following components:

- Newly granted options during the year;
- Previously granted, currently exercisable options;
- Previously granted, currently unexercisable options;
- The CEOs stock ownership.

As common shares exhibit a Delta of one, the Delta related with the CEOs stock ownership is equal to the number of shares held, consistently expressed with the option-based measure. Hence, the total CEO Delta can be assessed as:

$$\Delta^{CEO} = \Delta^{new} + \Delta^{exercisable} + \Delta^{unexercisable} + Shares$$

Vega, is then calculated by adding the Vega for the following portfolios:

- Newly granted options;
- Previously granted, currently exercisable options;
- Previously granted, currently unexercisable options.

Considering that direct stock holdings have linear payoffs, Vega is therefore Zero, and the total CEO Vega can be calculated as:

$$\nu^{CEO} = \nu^{new} + \nu^{exercisable} + \nu^{unexercisable}$$

Lastly, the resulting CEO Delta and CEO Vega measures are scaled as in the empirical analysis and expressed in USD millions, representing the estimated change in CEO wealth associated with a 1% change in the firm's stock price (Delta), and a 1% change in annualized stock-return volatility (Vega), respectively. To facilitate replication, *Table D1* exhibits the inputs used in the Core & Guay (2002) approximation of the respective identifiers within the ExecuComp database, as below:

Table C- ExecuComp Variable Identifiers

Component	Number of Options and Number of Shares	Realizable Value	Exercise Price
Newly Granted Options	OPTION_AWARDS_NUM	OPTION_AWARDS_RPT_VALUE	EXPRIC
Exercisable Options	OPT_UNEX_EXER_NUM	OPT_UNEX_EXER_EST_VAL	-
Unexercisable Options	OPT_UNEX_UNEXER_NUM	OPT_UNEX_UNEXER_EST_VAL	-
Direct Stock Ownership	SHROWN_EXCL_OPTS	-	-
Fiscal Year-End Stock Price	PRCCF	-	-

Appendix D- Constuction of Holder67 and Holder100

To measure CEO overconfidence, since it does not consist of a standard available directly in the databases used, it must be inferred based on the executive option exercise behavior. Thus, following Malmendier & Tate (2005, 2008), CEO overconfidence is measured by the Holder67 proxy and, later, the Holder100 robustness proxy, through the calculation of the average moneyness of the CEO's exercisable option portfolio.

To understand how deeply in-the-money a CEO's options are, the fiscal year-end is compared with the average exercise price of the CEO's exercisable options, however, since ExecuComp does not report the specific exercise prices of historical option grants, the average exercise price (K_{exer}) is estimated by the reported intrinsic value of the options:

- Stock price (S): The fiscal year-end stock price (PRCCF in ExecuComp).
- Average Exercise price (K_{exer}): calculated by subtracting the average intrinc value per-option from the stock price:

$$K_{exer} = S - \frac{Estimated\ Value\ of\ Exerciable\ Options}{Number\ of\ Exercisable\ Options}$$

Additionally, the average moneyness of the CEO's exercisable option portfolio is calculated as the percentage by which the stock price exceeds the estimated exercise price:

$$Moneyness = \frac{S}{K_{exer}} - 1$$

For which a moneyness of 0.67 indicates that the stock price is 67% above the estimated exercise price. This Holder67 proxy relies on the assumption that executives who retain exercisable options despite being substantially in-the-money demonstrate overconfidence behavior, consequently, the estimated moneyness is expressed by a dummy variable, constructed as:

- Holder67(Baseline): Takes the value of 1 if the CEO's exercisable options are at least 67% in-the-money $(Moneyness \geq 0.67)$, and 0 otherwise.
- Holder100(Robustness): Takes the value of 1 if the CEO's exercisable options are at least 100% in-the-money $(Moneyness \geq 1.00)$, and 0 otherwise.

Thus, Holder67 represents the baseline measure of CEO overconfidence in H2 and H3, whereas Holder100 provides a stricter alternative threshold for robustness analysis.

Appendix E- Event-Study and CAR Construction

For the measurement of the market's perception of acquisition announcements, Cumulative Abnormal Returns (CAR) are estimated using short-window event-study methodology (Brown & Warner, 1985), with expected returns benchmarked against the Fama-French factor models.

- Estimation Window ([-250, -30]): Factor sensitivities (β) and firm-specific intercepts(α) are calculated using daily stock returns during a 250-trading-day period ending 30 trading days prior to the acquisition announcement date ($t = 0$), since it reduces the likelihood of parameter estimates to be affected by pre-announcement information leakage or market anticipation.
- Primary Event Window ([-1, +1]): The baseline regressions' event-window spans across the trading day prior to the announcement until the trading day following the announcement, capturing immediate market reactions while limiting exposure to unrelated events.
- Robustness Event Windows: To address the sensitivity of the findings to alternative event-windows and understand whether the results are sensitive to slower market adjustment surrounding the announcement date, the [-2, +2]; [-3, +3], and 11-day window [-5, +5] are estimated.

Robustness checks are employed to address the sensitivity of the results to the risk-factor benchmark, hence, for these alternative specifications, expected returns are modeled under the Fama & French (2015) five-factor model. For which acquiring firm i, the five-factor model is calculated through Ordinary Least Squares (OLS) over the same [-250, -30] estimation window, as follows:

$$R_{it} - R_{ft} = \alpha_i + \beta_{iM}(R_{Mt} - R_{ft}) + \beta_{iS}SMB_t + \beta_{iH}HML_t + \beta_{iR}RMW_t + \beta_{iC}CMA_t + \varepsilon_{it}$$

Where the standard market, size and value factors remain consistent with the baseline specification, and the two additional factors are defined as:

- RMW_t (Robust Minus Weak): the difference between returns on diversified portfolios of stocks with robust and weak operating profitability.
- CMA_t (Conservative Minus Aggressive): the difference between returns on diversified portfolios of stocks of low/conservative and high/aggressive investment firms.

Abnormal returns and cumulative abnormal returns are constructed analogously to the three-factor estimate and employed in the robustness regressions to ensure that the baseline cumulative abnormal returns are not driven by omitted profitability or investment risk factors.

Appendix F- Pearson Correlation Matrix and Econometric Diagnostic Tests

Table F1 exhibits the Pearson correlation coefficients for all dependent, independent, and control variables used in the baseline (H1) and moderation regression models (H2 and H3). The Matrix addresses the bivariate linear relationships between the variables and consists of a preliminary diagnostic for potential multicollinearity. Significance levels indicated as ***, **, and * denote statistical significance at the 1%, 5% and 10% levels, respectively.

Table F1- Pearson Correlation Matrix

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
CEO Delta (1)	1.0000														
CEO Vega (2)	0.3660***	1.0000													
CEO Overconfidence (Holder67) (3)	0.0157	0.0042	1.0000												
CAR [-1,+1] (4)	-0.0208	-0.0514**	-0.0008	1.0000											
Firm Size (ln Assets) (5)	0.1742***	0.3558***	-0.0717***	-0.1241***	1.0000										
ROA (6)	0.1851***	0.2123***	-0.0030	0.0017	0.0315	1.0000									
Leverage (7)	-0.0555**	-0.0116	0.1220***	0.0549**	0.0426*	-0.0318	1.0000								
Tobin's Q (8)	0.2074***	0.2021***	0.0314	-0.0306	-0.0854***	0.7152***	0.1467***	1.0000							
Cash-to-Assets Ratio (9)	0.0621***	0.0536**	-0.0188	-0.0012	-0.1855***	0.3314***	-0.1315***	0.3271***	1.0000						
Relative Deal Value (10)	-0.0625***	-0.1169***	0.0216	-0.0414*	-0.0659***	-0.2327***	0.0998***	-0.2268***	-0.0680***	1.0000					
Cross-Border (11)	0.0042	0.0361	-0.0383	-0.0216	0.0200	0.1129***	0.0509**	0.1171***	0.0796***	-0.1796***	1.0000				
Same Industry (12)	0.0629***	-0.0643***	-0.0608**	0.0345	-0.0521**	-0.0943***	-0.0439*	-0.0723***	-0.0561**	0.1021***	-0.0706***	1.0000			
Female CEO (13)	-0.0238	0.0581**	-0.0050	-0.0155	0.0054	-0.0168	-0.0025	-0.0369	-0.0401*	0.0248	-0.0489**	0.0392*	1.0000		
CEO Age (14)	0.0665***	0.0454**	0.0144	-0.0192	0.1135***	-0.0468**	0.0512**	-0.0645***	-0.0716***	0.0178	0.0007	-0.0050	-0.0446*	1.0000	
CEO Duality (15)	-0.0010	0.2194***	-0.0165	-0.0240	0.1381***	-0.0426*	0.0203	-0.0322	-0.0554**	-0.0152	-0.0066	-0.0184	-0.0168	0.2943***	1.0000

Furthermore, to ensure the validity of the Ordinary Least Squares (OLS) estimates, several econometric tests were conducted on the baseline regression model. *Table F2* summarizes the results of multicollinearity, heteroskedasticity and model specification tests.

Table F2 – Summary of Econometric Diagnostic Tests

Diagnostic Test	Null Hypothesis (H0)	Statistic	p-value	Conclusion
Variance Inflation Factor (VIF)	No severe multicollinearity	Mean VIF = 1.85	—	H0 not rejected: multicollinearity is within acceptable limits.
Breusch-Pagan Test	Constant variance (Homoskedasticity)	$\chi^2(1) = 4.73$	0.0296	H0 rejected: heteroskedasticity present. Clustered standard errors are applied.
Ramsey RESET Test	Model has no omitted variables (Correct specification)	$F(3, 1738) = 4.80$	0.0025	H0 rejected: firm and year fixed effects included, however some nonlinearities can remain.

Appendix G- Expanded Regression Results Across Alternative windows

The following Tables *Table G1*, *Table G2*, *Table G3* and *Table G4* the expanded regression results across alternative windows are presented, including the findings for each one of the controls, previously suppressed for simpler visualization and interpretation of the main variables in *Table 5*.

Table G1- Full Results for Alternative Event Windows for Managerial Incentives (H1)

This table reports the full robustness checks for the baseline model using alternative event windows to calculate cumulative abnormal returns (CAR). The dependent variables are the CAR measured over the [-2, +2], [-3, +3], and [-5, +5] event windows. Standard errors clustered at the firm level are reported in parentheses, and cash payment consist of the omitted reference payment category. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Variables	CAR [-2,+2]	CAR [-3,+3]	CAR [-5,+5]
Managerial Incentives (H1)			
CEO Delta	0.0001	-0.0000	0.0001
	(0.0001)	(0.0001)	(0.0002)
CEO Vega	-0.0007	-0.0002	-0.0026
	(0.0029)	(0.0028)	(0.0032)
Firm Size (In Assets)	-0.0032***	-0.0032***	-0.0032***
	(0.0008)	(0.0008)	(0.0010)
ROA	0.0321	0.0290	0.0769
	(0.0361)	(0.0403)	(0.0510)
Leverage	0.0245***	0.0223***	0.0303***
	(0.0071)	(0.0073)	(0.0095)
Tobin's Q	-0.0050***	-0.0058***	-0.0090***
	(0.0018)	(0.0020)	(0.0025)
Cash-to-Assets Ratio	0.0076	-0.0021	0.0064
	(0.0173)	(0.0181)	(0.0218)
Relative Deal Value	-0.0154	-0.0126	-0.0086
	(0.0098)	(0.0096)	(0.0114)
Cross-Border	-0.0051**	-0.0039	-0.0047
	(0.0023)	(0.0024)	(0.0031)
Same Industry	0.0025	0.0014	0.0038
	(0.0024)	(0.0026)	(0.0030)
Female CEO	-0.0135***	-0.0206***	-0.0243***
	(0.0046)	(0.0049)	(0.0056)
CEO Age	0.0000	0.0001	-0.0000
	(0.0002)	(0.0002)	(0.0003)
CEO Duality	-0.0017	-0.0008	0.0015
	(0.0023)	(0.0025)	(0.0031)
Stock Payment	-0.0083	-0.0161**	-0.0168**
	(0.0066)	(0.0068)	(0.0078)
Mixed Payment	0.0013	0.0006	0.0000
	(0.0043)	(0.0044)	(0.0056)
Other Payment	-0.0013	-0.0010	-0.0004
	(0.0024)	(0.0027)	(0.0032)
Constant	0.0871***	0.0844***	0.0839***
	(0.0216)	(0.0240)	(0.0297)
Industry & Year FE	Yes	Yes	Yes
Observations	1,813	1,813	1,813
Adjusted R^2	0.0493	0.0398	0.0229

Table G2- Full Results for Alternative Event Windows for CEO overconfidence (H2)

This table reports the extended robustness checks studying the relationship between CEO overconfidence and alternative acquirer announcement returns. Standard errors clustered at the firm level are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Variables	**CAR [-2,+2]**	**CAR [-3,+3]**	**CAR [-5,+5]**
Managerial Incentives (H1)			
CEO Overconfidence (Holder67)	0.0020	0.0010	-0.0001
	(0.0051)	(0.0057)	(0.0063)
Firm Size (In Assets)	-0.0027***	-0.0028***	-0.0025**
	(0.0009)	(0.0009)	(0.0012)
ROA	0.0324	0.0448	0.0793
	(0.0401)	(0.0459)	(0.0582)
Leverage	0.0214***	0.0216***	0.0314***
	(0.0075)	(0.0082)	(0.0109)
Tobin's Q	-0.0058***	-0.0065***	-0.0090***
	(0.0019)	(0.0023)	(0.0028)
Cash-to-Assets Ratio	0.0184	0.0105	0.0320
	(0.0190)	(0.0196)	(0.0233)
Relative Deal Value	-0.0144	-0.0123	-0.0086
	(0.0110)	(0.0107)	(0.0127)
Cross-Border	-0.0025	-0.0010	-0.0025
	(0.0026)	(0.0027)	(0.0035)
Same Industry	0.0042	0.0030	0.0049
	(0.0027)	(0.0029)	(0.0033)
Female CEO	-0.0151***	-0.0211***	-0.0255***
	(0.0049)	(0.0053)	(0.0058)
CEO Age	0.0000	0.0000	-0.0000
	(0.0002)	(0.0002)	(0.0003)
CEO Duality	-0.0020	-0.0005	0.0006
	(0.0025)	(0.0028)	(0.0034)
Stock Payment	-0.0078	-0.0117	-0.0107
	(0.0077)	(0.0083)	(0.0097)
Mixed Payment	-0.0008	-0.0012	-0.0022
	(0.0050)	(0.0052)	(0.0066)
Other Payment	-0.0027	-0.0027	-0.0022
	(0.0027)	(0.0030)	(0.0036)
Constant	0.0756***	0.0734***	0.0634*
	(0.0271)	(0.0288)	(0.0340)
Industry & Year FE	Yes	Yes	Yes
Observations	1,515	1,515	1,515
Adjusted R^2	0.0484	0.0341	0.0172

Table G3- Full Results for Alternative Event Windows for Delta Moderation (H3a)

This table represents the full robustness checks understanding whether CEO overconfidence moderates the relationship between CEO Delta and alternative acquisition announcement windows. Standard errors clustered at the firm level are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Variables	CAR [-2,+2]	CAR [-3,+3]	CAR [-5,+5]
Managerial Incentives (H1)			
CEO Delta	-0.0001	-0.0002	-0.0000
	(0.0002)	(0.0002)	(0.0002)
CEO Vega	0.0014	0.0008	-0.0023
	(0.0034)	(0.0036)	(0.0040)
CEO Overconfidence	0.0017	0.0002	0.0012
	(0.0051)	(0.0057)	(0.0063)
CEO Delta × Overconfidence	0.0001	0.0004	-0.0005
	(0.0005)	(0.0006)	(0.0005)
Firm Size (In Assets)	-0.0028***	-0.0028***	-0.0021
	(0.0010)	(0.0010)	(0.0013)
ROA	0.0313	0.0441	0.0772
	(0.0405)	(0.0469)	(0.0582)
Leverage	0.0214***	0.0215***	0.0305***
	(0.0075)	(0.0083)	(0.0110)
Tobin's Q	-0.0057***	-0.0063***	-0.0086***
	(0.0020)	(0.0024)	(0.0028)
Cash-to-Assets Ratio	0.0186	0.0106	0.0317
	(0.0190)	(0.0196)	(0.0234)
Relative Deal Value	-0.0144	-0.0123	-0.0086
	(0.0110)	(0.0107)	(0.0127)
Cross-Border	-0.0025	-0.0010	-0.0025
	(0.0026)	(0.0028)	(0.0035)
Same Industry	0.0042	0.0030	0.0048
	(0.0027)	(0.0029)	(0.0033)
Female CEO	-0.0154***	-0.0214***	-0.0252***
	(0.0047)	(0.0052)	(0.0059)
CEO Age	0.0000	0.0001	-0.0000
	(0.0002)	(0.0002)	(0.0003)
CEO Duality	-0.0021	-0.0007	0.0009
	(0.0026)	(0.0028)	(0.0034)
Stock Payment	-0.0077	-0.0116	-0.0107
	(0.0077)	(0.0083)	(0.0098)
Mixed Payment	-0.0008	-0.0012	-0.0020
	(0.0050)	(0.0052)	(0.0067)
Other Payment	-0.0028	-0.0028	-0.0021
	(0.0026)	(0.0030)	(0.0036)
Constant	0.0747***	0.0753***	0.0565
	(0.0257)	(0.0256)	(0.0358)
Industry & Year FE	Yes	Yes	Yes
Observations	1,515	1,515	1,515
Adjusted R^2	0.0466	0.0334	0.0155

Table G4- Full Results for Alternative Event Windows for Vega Moderation (H3b)

This table reports the expanded robustness checks exploring whether CEO overconfidence moderates the relationship between CEO Vega and alternative acquisition announcement windows. Standard errors clustered at the firm level are reported in parentheses. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Variables	CAR [-2,+2]	CAR [-3,+3]	CAR [-5,+5]
Managerial Incentives (H1)			
CEO Delta	-0.0001	-0.0002	-0.0000
	(0.0002)	(0.0002)	(0.0002)
CEO Vega	0.0014	0.0008	-0.0023
	(0.0034)	(0.0036)	(0.0040)
CEO Overconfidence	0.0017	0.0002	0.0012
	(0.0051)	(0.0057)	(0.0063)
CEO Delta × Overconfidence	0.0001	0.0004	-0.0005
	(0.0005)	(0.0006)	(0.0005)
Firm Size (In Assets)	-0.0028***	-0.0028***	-0.0021
	(0.0010)	(0.0010)	(0.0013)
ROA	0.0313	0.0441	0.0772
	(0.0405)	(0.0469)	(0.0582)
Leverage	0.0214***	0.0215***	0.0305***
	(0.0075)	(0.0083)	(0.0110)
Tobin's Q	-0.0057***	-0.0063***	-0.0086***
	(0.0020)	(0.0024)	(0.0028)
Cash-to-Assets Ratio	0.0186	0.0106	0.0317
	(0.0190)	(0.0196)	(0.0234)
Relative Deal Value	-0.0144	-0.0123	-0.0086
	(0.0110)	(0.0107)	(0.0127)
Cross-Border	-0.0025	-0.0010	-0.0025
	(0.0026)	(0.0028)	(0.0035)
Same Industry	0.0042	0.0030	0.0048
	(0.0027)	(0.0029)	(0.0033)
Female CEO	-0.0154***	-0.0214***	-0.0252***
	(0.0047)	(0.0052)	(0.0059)
CEO Age	0.0000	0.0001	-0.0000
	(0.0002)	(0.0002)	(0.0003)
CEO Duality	-0.0021	-0.0007	0.0009
	(0.0026)	(0.0028)	(0.0034)
Stock Payment	-0.0077	-0.0116	-0.0107
	(0.0077)	(0.0083)	(0.0098)
Mixed Payment	-0.0008	-0.0012	-0.0020
	(0.0050)	(0.0052)	(0.0067)
Other Payment	-0.0028	-0.0028	-0.0021
	(0.0026)	(0.0030)	(0.0036)
Constant	0.0747***	0.0753***	0.0565
	(0.0257)	(0.0256)	(0.0358)
Industry & Year FE	Yes	Yes	Yes
Observations	1,515	1,515	1,515
Adjusted R^2	0.0466	0.0334	0.0155

Appendix H- Full Alternative Asset-Pricing Model: Fama-French Five-Factor Model

This section presents the full regression output for the robustness checks previously discussed in *Table 6* and *Table 7*. The results for the control variable coefficients were suppressed to preserve the readability of the main text, thus, *Table H1* exhibits the details for the estimation of the complete Fama-French Five-Factor asset-pricing specification, followed by Table *H2* which reports the estimations according to the stricter Holder100 CEO overconfidence proxy.

Table H1- Complete Results from the Fama-French Five-Factor CARs

This table presents the complete robustness tests using cumulative abnormal returns estimated from the Fama-French five-factor model. The dependent variable is the CAR measured over the three-day event window [-1,+1]. Standard errors clustered at the firm level are reported in parentheses. Cash payment is the omitted reference payment category. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Variables	Managerial Incentives (H1)	CEO Overconfidence (H2)	Delta Moderation (H3a)	Vega Moderation (H3b)
CEO Delta	0.0001		-0.0001	-0.0000
	(0.0001)		(0.0002)	(0.0002)
CEO Vega	-0.0005		0.0011	0.0007
	(0.0027)		(0.0032)	(0.0032)
CEO Overconfidence (Holder67)		0.0001	-0.0006	-0.0032
		(0.0043)	(0.0041)	(0.0048)
CEO Delta × Overconfidence			0.0003	
			(0.0005)	
CEO Vega × Overconfidence				0.0106
				(0.0067)
Firm Size (In Assets)	-0.0033***	-0.0028***	-0.0029***	-0.0029***
	(0.0007)	(0.0007)	(0.0009)	(0.0009)
ROA	0.0507	0.0548	0.0553	0.0558
	(0.0312)	(0.0344)	(0.0348)	(0.0346)
Leverage	0.0230***	0.0214***	0.0217***	0.0217***
	(0.0063)	(0.0063)	(0.0063)	(0.0063)
Tobin's Q	-0.0053***	-0.0062***	-0.0063***	-0.0063***
	(0.0016)	(0.0017)	(0.0018)	(0.0018)
Cash-to-Assets Ratio	-0.0093	-0.0043	-0.0042	-0.0039
	(0.0139)	(0.0153)	(0.0153)	(0.0153)
Relative Deal Value	-0.0119	-0.0126	-0.0125	-0.0125
	(0.0084)	(0.0094)	(0.0094)	(0.0094)
Cross-Border	-0.0037*	-0.0030	-0.0030	-0.0030
	(0.0020)	(0.0022)	(0.0022)	(0.0022)
Same Industry	0.0038*	0.0050**	0.0051**	0.0051**
	(0.0022)	(0.0023)	(0.0023)	(0.0023)
Female CEO	-0.0087**	-0.0095**	-0.0097**	-0.0096**
	(0.0039)	(0.0041)	(0.0041)	(0.0041)
CEO Age	0.0001	0.0000	0.0000	0.0000
	(0.0002)	(0.0002)	(0.0002)	(0.0002)
CEO Duality	-0.0012	-0.0011	-0.0013	-0.0013
	(0.0021)	(0.0022)	(0.0022)	(0.0022)
Stock Payment	-0.0133**	-0.0109	-0.0109	-0.0109
	(0.0055)	(0.0067)	(0.0067)	(0.0067)
Mixed Payment	-0.0022	-0.0035	-0.0036	-0.0036
	(0.0040)	(0.0045)	(0.0045)	(0.0045)
Other Payment	-0.0011	-0.0017	-0.0017	-0.0017
	(0.0020)	(0.0021)	(0.0021)	(0.0021)
Constant	0.0823***	0.0713***	0.0731***	0.0737***
	(0.0189)	(0.0204)	(0.0223)	(0.0222)
Industry & Year FE	Yes	Yes	Yes	Yes
Observations	1,813	1,515	1,515	1,515
Adjusted R^2	0.0567	0.0592	0.0574	0.0578

Table H2 – Full Results of the Alternative Measure for CEO Overconfidence

This table reports the expanded robustness checks using the stricter Holder100 proxy for CEO overconfidence instead of Holder67. The dependent variable is the CAR measured over the three-day event window [-1, +1]. Standard errors clustered at the firm level are reported in parentheses. Cash payment is the omitted reference category for payment. ***, ** , and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Variables	**CEO Overconfidence (H2)**	**Delta Moderation (H3a)**	**Vega Moderation (H3b)**
CEO Overconfidence (Holder100)	-0.0002	-0.0002	-0.0042
	(0.0041)	(0.0042)	(0.0049)
CEO Delta		-0.0001	-0.0001
		(0.0002)	(0.0002)
CEO Vega		0.0013	0.0009
		(0.0031)	(0.0032)
CEO Delta × Overconfidence		-0.0000	
		(0.0002)	
CEO Vega × Overconfidence			0.0118*
			(0.0068)
Firm Size (In Assets)	-0.0030***	-0.0032***	-0.0032***
	(0.0007)	(0.0008)	(0.0008)
ROA	0.0500	0.0492	0.0506
	(0.0327)	(0.0330)	(0.0329)
Leverage	0.0215***	0.0216***	0.0219***
	(0.0063)	(0.0064)	(0.0064)
Tobin's Q	-0.0062***	-0.0062***	-0.0062***
	(0.0017)	(0.0017)	(0.0017)
Cash-to-Assets Ratio	-0.0044	-0.0042	-0.0040
	(0.0153)	(0.0154)	(0.0153)
Relative Deal Value	-0.0134	-0.0134	-0.0134
	(0.0094)	(0.0094)	(0.0094)
Cross-Border	-0.0026	-0.0026	-0.0026
	(0.0022)	(0.0022)	(0.0022)
Same Industry	0.0051**	0.0052**	0.0052**
	(0.0023)	(0.0023)	(0.0023)
Female CEO	-0.0103**	-0.0106***	-0.0106***
	(0.0041)	(0.0041)	(0.0041)
CEO Age	0.0000	0.0000	0.0000
	(0.0002)	(0.0002)	(0.0002)
CEO Duality	-0.0010	-0.0011	-0.0012
	(0.0022)	(0.0022)	(0.0022)
Stock Payment	-0.0096	-0.0095	-0.0095
	(0.0065)	(0.0066)	(0.0065)
Mixed Payment	-0.0027	-0.0027	-0.0028
	(0.0045)	(0.0045)	(0.0045)
Other Payment	-0.0022	-0.0022	-0.0023
	(0.0022)	(0.0022)	(0.0022)
Constant	0.0787***	0.0805***	0.0810***
	(0.0203)	(0.0222)	(0.0220)
Industry & Year FE	Yes	Yes	Yes
Observations	1,515	1,515	1,515
Adjusted R^2	0.0641	0.0622	0.0629

Appendix J- Alternative Specifications Excluding Fixed Effects

The following Tables *G1* and *G2* present the estimation results and moderation Ordinary Least Squares (OLS) regression models excluding Fama-French 48 industry fixed effects and year fixed effects, respectively. These specifications are estimated to ensure that the primary findings discussed in Chapter 5 are not uniquely driven by model misspecification arising from highly dimensional dummy variables. All models use Cumulative Abnormal Returns, CAR [-1, +1] as the dependent variable and employ heteroskedasticity-robust standard errors clustered at the acquiring-firm level. Robust standard errors clustered at the firm level are reported in parentheses. ***, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Table J1- Baseline Regressions without Fixed Effects

Variables	H1	H2
CEO Delta	0.0001	
	(0.0001)	
CEO Vega	-0.0005	
	(0.0027)	
CEO Overconfidence		-0.0021
		(0.0044)
Firm Size (ln Assets)	-0.0033***	-0.0029***
	(0.0006)	(0.0007)
ROA	0.0592**	0.0596*
	(0.0294)	(0.0323)
Leverage	0.0176***	0.0168***
	(0.0058)	(0.0060)
Tobin's Q	-0.0056***	-0.0058***
	(0.0014)	(0.0015)
Cash-to-Assets Ratio	-0.0060	-0.0021
	(0.0137)	(0.0151)
Relative Deal Value	-0.0104	-0.0092
	(0.0083)	(0.0093)
Cross-Border	-0.0030	-0.0017
	(0.0019)	(0.0021)
Same Industry	0.0031*	0.0040**
	(0.0019)	(0.0020)
Female CEO	-0.0052	-0.0047
	(0.0046)	(0.0049)
CEO Age	0.0000	0.0000
	(0.0002)	(0.0002)
CEO Duality	-0.0005	-0.0008
	(0.0021)	(0.0022)
Stock Payment	-0.0149***	-0.0137**
	(0.0050)	(0.0059)
Mixed Payment	-0.0026	-0.0041
	(0.0037)	(0.0041)
Other Payment	-0.0005	-0.0012
	(0.0020)	(0.0022)
Constant	0.0831***	0.0716***
	(0.0173)	(0.0183)
Industry FE	No	No
Year FE	No	No
Observations	1,813	1,515
Adjusted R^2	0.0397	0.0352

Table J2- Interaction Regressions (H3a, H3b) without Fixed Effects

Variables	Delta Model	Vega Model
CEO Delta	0.0000	0.0000
	(0.0002)	(0.0002)
CEO Vega	0.0004	0.0000
	(0.0031)	(0.0031)
CEO Overconfidence	-0.0029	-0.0045
	(0.0040)	(0.0052)
CEO Delta × Overconfidence	0.0004	
	(0.0007)	
CEO Vega × Overconfidence		0.0074
		(0.0063)
Firm Size (ln Assets)	-0.0029***	-0.0030***
	(0.0007)	(0.0007)
ROA	0.0603*	0.0601*
	(0.0326)	(0.0326)
Leverage	0.0171***	0.0170***
	(0.0060)	(0.0060)
Tobin's Q	-0.0059***	-0.0059***
	(0.0015)	(0.0015)
Cash-to-Assets Ratio	-0.0022	-0.0020
	(0.0152)	(0.0152)
Relative Deal Value	-0.0092	-0.0092
	(0.0093)	(0.0093)
Cross-Border	-0.0017	-0.0018
	(0.0021)	(0.0021)
Same Industry	0.0040**	0.0041**
	(0.0020)	(0.0020)
Female CEO	-0.0048	-0.0046
	(0.0049)	(0.0049)
CEO Age	0.0000	0.0000
	(0.0002)	(0.0002)
CEO Duality	-0.0009	-0.0009
	(0.0022)	(0.0022)
Stock Payment	-0.0137**	-0.0137**
	(0.0059)	(0.0059)
Mixed Payment	-0.0042	-0.0042
	(0.0042)	(0.0042)
Other Payment	-0.0012	-0.0012
	(0.0022)	(0.0023)
Constant	0.0728***	0.0731***
	(0.0192)	(0.0193)
Industry FE	No	No
Year FE	No	No
Observations	1,515	1,515
Adjusted R^2	0.0355	0.0355

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