Article:

GUPTA, JAIRAJ (2025) From Monetary Policy to Capital Investment: The Role of Executive Compensation. Review of Quantitative Finance and Accounting. ISSN: 0924-865X

https://doi.org/10.1007/s11156-025-01446-w

From Monetary Policy to Capital Investment: The Role of Executive Compensation

Samer Adra
University of Sheffield, United Kingdom
samer.adra@sheffield.ac.uk

Jairaj Gupta
University of York, United Kingdom
jairaj.gupta@york.ac.uk

Elie Menassa
Amity University Dubai, United Arab Emirates
emenassa@amityuniversity.ae

Abstract

By placing corporate governance at the core of analysing the effect of monetary policy on investments, this paper argues that the firm's capital investment response to monetary policy is shaped by how CEO compensation incentivizes risk-taking. We posit that, due to the risks arising from monetary policy decisions, CEO compensation structures that encourage risk-taking lead to a stronger investment response to monetary shocks. Our analysis, based on a comprehensive dataset of 75,352 firm-level observations from 2,302 U.S. firms spanning 1993 to 2018, supports this conjecture: a high CEO compensation sensitivity to stock volatility (Vega) strengthens the firm's investment response to monetary shocks. An increase in Vega from its 25^{th} to 75^{th} percentile in our sample increases (or decreases) the rate of capital investments in response to expansionary (or contractionary) monetary shocks by roughly a third. This effect is accentuated by strong financial flexibility and low economic uncertainty. We also demonstrate that high Vegas partially counterbalance the risk-averse investment response to monetary shocks driven by high Deltas.

1. Introduction

Monetary policy is widely recognized as one of the most significant macroeconomic forces, driving up to half of the variation in macroeconomic output (Barakchian and Crowe, 2013). Since investment plays a major role in the business cycle, the response of firm-level investments to monetary policy attracts considerable attention from both policymakers and academics. Central bankers frequently evaluate this reaction as part of their efforts to achieve the goal of full employment (Powell, 2023; Yellen, 2016). In academic circles, there has been a growing focus on understanding how key firm-specific financial characteristics influence the magnitude and speed of a firm’s investment response (Cloyne et al., 2023; Durante et al., 2022; Ottonello and Winberry, 2020). This literature reveals two important findings. First, investments in physical capital, rather than intangible assets, are highly sensitive to monetary shocks, especially since tangible fixed assets are more likely to serve as credit collateral (Döttling and Ratnovski, 2023). Second, the response of such investments to monetary policy varies widely and is heavily influenced by factors such as the firm’s age and leverage (Cloyne et al., 2023; Durante et al., 2022).

The main argument of this article is that, while firm-specific financial measures are important for explaining the investment response to monetary shocks, a thorough analysis remains incomplete without considering how corporate managers are rewarded and incentivized. Although there is extensive literature on how compensation influences corporate decisions (Coles et al., 2006; Edmans et al., 2017a; Gormley and Matsa, 2016; Liu and Mauer, 2011), these factors are largely absent from studies on monetary policy. Our goal is to address this gap by conducting the first examination of how executive compensation structures shape a firm's investment response to monetary policy.

Our analysis begins with the recognition of the significant risks firms face when adjusting their capital expenditures in response to monetary shocks. While intangibles are generally perceived as riskier than capital expenditures (CAPX) due to their inherent uncertainty (Coles et al., 2006), several factors suggest that the relative riskiness of CAPX increases during periods of strong monetary intervention. Given that the economic effects of monetary shocks, despite their large magnitude, are typically unpredictable and fluctuate over time (Boivin et al., 2010; Jansen and Zervou, 2017), executing significant changes in capital investment in response to monetary shocks comes with significant risks. This is especially relevant given the cyclical and interest-rate sensitivities of tangible capital (Durante et al., 2022; Peersman and Smets, 2005). On the one hand, expanding capital investments, beyond what the evolving economic environment requires, could leave firms with a large stock of durable assets that are highly sensitive to economic fluctuations. On the other hand, underinvesting in CAPX might prevent firms from taking advantage of significant investment opportunities and could limit their ability to use collateral to finance future investments (Döttling and Ratnovski, 2023). Supporting this view, our initial estimations suggest that the relative contribution of capital investments to firm-level stock volatility significantly increases during periods of strong monetary interventions.

Building on this empirical insight, and recognizing the pivotal role of the CEO in driving the firm's adaptability (Bernile et al., 2017; Chen et al., 2021; Kong et al., 2020), our central proposition is that making significant CAPX adjustments in response to monetary shocks requires a CEO compensation structure that incentivizes risk-taking. Without such a structure, CEOs are likely to adopt a more risk-averse approach, which limits the extent of their CAPX adjustments. To empirically carry out this investigation, we appeal to the body of literature that leverages option pricing models to quantify the sensitivities of CEO compensation to various stock performance metrics (Coles et al., 2006, 2013; Edmans and Gabaix, 2016; Liu and Mauer, 2011; Mazur and Salganik-Shoshan, 2019). This approach allows for a more precise understanding of the risk-reward dynamics embedded in executive pay and how these incentives align with corporate performance and shareholders' interests.

Our focus is on a key parameter, Vega, which measures the sensitivity of the CEO compensation to stock volatility. Vega has gained increasing recognition in recent studies for its role in incentivizing executives to take additional risks. While linking CEO compensation to firm stock performance—measured by Delta—has long been acknowledged as a critical step in mitigating agency problems within firms (Edmans Gabaix, 2009; Guay, 1999; Jensen and Meckling, 1976), a drawback of higher Deltas is that risk-averse executives may hesitate to pursue capital adjustment opportunities that might temporarily lower their share-based compensations (Coles et al., 2006; Hayes et al., 2012; Knopf et al., 2002). Raising Vega is expected to alleviate these concerns, and empirical evidence supports this view. Firms with high CEO Vegas tend to make riskier investment and financing decisions (Carline et al., 2023), and such high Vegas positively contribute to firm wealth in environments where identifying investment opportunities is challenging, requiring significant leaps of faith by executives (Benson et al., 2019).

Accordingly, our main empirical prediction is that, while a high Delta might deter the CEOs from making immediate CAPX adjustments aligned with the direction of monetary shocks, a high Vega alleviates this problem. Specifically, we hypothesize that firms with high CEO compensation Vegas will experience a greater increase in capital investment in response to expansionary shocks and a larger decrease in this investment in response to contractionary shocks. Our analysis, based on a comprehensive dataset of 75,352 firm-level observations from 2,302 firms spanning 1993 to 2018, provides strong evidence supporting our prediction.

Using the monetary shock measures developed by Jarociński and Karadi (2020) as indicators of exogenous changes in monetary policy, we find that the firm-level capital investment reactions to monetary shocks are significantly amplified by higher CEO compensation Vegas. More specifically, an increase in Vega from the first to the third quartile increases the firm's propensity to increase (or decrease) investments in response to expansionary (or contractionary) monetary shocks by 30%. Higher Delta in turn, pulls the investment response to monetary shocks in an opposite direction, partly offsetting Vega's positive impact. Moreover, further evidence from focusing on the interactive effects of Vega and Delta reinforces the idea that Vega mitigates the risk-aversion tendencies associated with high Deltas: the effectiveness of Vega in amplifying the investment response to monetary shocks is even more pronounced when Delta is higher.

Acknowledging the importance of a firm's financial flexibility in shaping its ability to respond to monetary shocks (Cloyne et al., 2023; Durante et al., 2022; Jeenas, 2019), we expand our analysis to assess how Vega's role in driving investments is influenced by the firm's financial flexibility. Our results strongly support the notion that financial flexibility significantly enhances Vega's role in amplifying the investment response to monetary shocks. Specifically, we find that for young, non-dividend-paying firms—identified by Cloyne et al. (2023) as robust representatives of financially constrained firms—Vega's effect on accentuating the investment response to monetary shocks is considerably weaker. In other words, our findings suggest that limited financial constraints enable executives with high Vegas to make bolder CAPX adjustments following monetary shocks.

We also explore the informational conditions that influence executives' investment incentives in response to monetary shocks. Specifically, we appeal to the classical differentiation between risk and uncertainty (Keynes, 1921; Knight, 1921; Lo, 2017), with its implications for the effectiveness of Vega in driving a more robust investment reaction to monetary policy. Our primary conjecture is that the CEOs' prompt and substantial investment response to monetary policy necessitates an informational environment where risks can be identified and, at least partly, quantified. However, this ability is significantly compromised under conditions of high uncertainty (Dixit and Pindyck, 1994; Gulen and Ion, 2016; Lo, 2017), leading executives to postpone crucial investment-related decisions. Consequently, we predict that the substantial role of Vega in driving the investment response to monetary policy is restricted to periods characterized by low and moderate macroeconomic uncertainty. Our findings provide strong support for the stated prediction. Using the 12-month-ahead macroeconomic uncertainty index developed by (Jurado et al., 2015) to measure uncertainty at the time of monetary shocks, we show that increased uncertainty significantly weakens the investment response linked to Vega. Specifically, our results indicate that high economic uncertainty reduces more than three-quarters of Vega's influence on capital investment in response to monetary shocks.

Our findings are robust across several tests. First, they remain consistent when quarterly capital investments are scaled by the firm's assets rather than net property, plant, and equipment. Second, Vega's pronounced effect in amplifying the investment response is significantly stronger for CAPX than for intangibles, reinforcing the idea that executive compensation plays a more critical role in driving variations in CAPX, particularly during periods of monetary interventions. Third, the findings persist even after controlling for a broad range of corporate governance factors, including takeover vulnerability, board size, and CSR spending. Finally, the results are robust when using the differences between Vega and Delta relative to their predicted values based on firm-level characteristics.

In summary, our findings establish a crucial connection between two often separate areas of research: the first focuses on how firms respond to monetary policy (Cloyne et al., 2023; Durante et al., 2022; Ottonello and Winberry, 2020), while the second examines the investment and financing implications of executive compensation (Brockman et al., 2010; Carline et al., 2023; Gormley and Matsa, 2016; Mazur and Salganik-Shoshan, 2019). Our results underscore the central role of managerial incentives in the transmission of monetary policy into corporate investment decisions. By doing so, we deepen our understanding of the firm-level variations that influence how fixed investments respond to monetary policy. One direct implication of our findings is that monetary economists, in their efforts to develop microeconomic models explaining the effects of monetary shocks, must consider the incentives that drive executive behavior. By incorporating managerial incentives into theoretical models, we can achieve a more nuanced understanding of monetary policy, leading to more accurate predictions.

From a corporate governance standpoint, our findings underscore the significance of executive compensation structure, particularly its incentives for risk-taking by the CEO, in shaping the firm's responsiveness to one of the most influential macroeconomic forces: monetary policy. Monetary policy serves as a critical driver of aggregate output, inflation (Barakchian and Crowe, 2013; Boivin et al., 2010; Gertler and Karadi, 2015), stock market valuations (Bernanke and Kuttner, 2005; Galí and Gambetti, 2015; Kurov, 2010; Thorbecke, 1997), and even political outcomes (Adra, 2022). Given that political tensions often constrain the effectiveness of fiscal and macro-prudential measures, monetary policy has assumed a central role in macroeconomic decision-making (El-Erian, 2016; Jacobs and King, 2016). Our findings highlight the interplay between the investment impacts of monetary policy (Adra et al., 2020; Adra and Menassa, 2023; Durante et al., 2022) and the structure of executive compensation within firms. One crucial takeaway is that corporate governance analysis seeking to provide a comprehensive understanding of the firm's decision-making challenges should explicitly consider the influence of monetary policy.

This paper proceeds as follows: Section 2 provides the background and our predictions; Section 3 describes the exogenous monetary shock series; Section 4 describes the dataset covering the firm-level executive compensation structure in addition to various firm- and economy-wide controls; Section 5 presents the results and their related discussions, and Section 6 concludes the study.

2. Research Motivation and Predictions

2.1. Vegas, Deltas, and firms' investment response to monetary policy

Linking executive compensation to stock performance is often lauded as an effective mechanism for addressing agency problems within a firm (Jensen and Meckling, 1976). However, simply tying managerial compensation to stock performance isn't enough to guarantee that managers will make decisions that maximize value for shareholders. This is especially true for highly risk-averse managers, as they may shy away from potentially lucrative yet risky opportunities (Smith and Stulz, 1985). Consequently, incentivizing managers to take on additional risks in pursuit of value-maximizing changes to the firm's investment strategies, has been proposed as a viable solution. This underscores the importance of executive wealth responsiveness to stock volatility (Vega) as a key factor influencing managerial risk-taking behaviour (Carline et al., 2023; Coles et al., 2006).[1]

The analysis of the distinct effect of Delta and Vega has been a subject of fruitful discussion in the theoretical and empirical literature. This literature highlights the distinct impacts of Delta and Vega on critical corporate decisions, such as debt maturity decisions (Brockman et al., 2010) and the decision to engage in spin-offs (Mazur and Salganik-Shoshan, 2019), among others.[2] In the context of investments, Coles et al. (2006) provide compelling evidence that higher Vegas incentivize investments in risky intangibles, thus counterbalancing the managerial conservatism that may arise from Deltas.

Liu and Mauer (2011) investigate how CEO compensation incentives impact corporate cash holdings and the value of cash. They find a significant positive association between the Vega of a CEO's compensation and cash holdings, suggesting that bondholders recognize the risk-taking incentives that come with high Vegas. Benson et al. (2019), in turn, establish that the influence of Delta and Vega on firm value is contingent upon the firm's context. Their findings indicate that Delta is more advantageous for firms possessing abundant investment opportunities and elevated risk tolerance. In turn, Vega

[1] Ross (2004) argues that the dominant presumption that a convex fee structure diminishes an agent's risk aversion, whereas a concave one intensifies it, represents, at best, a reductionist perspective. He shows analytically that higher delta may increase managerial risk aversion.

[2] Using lagged Delta and Vega and controlling for various firm and CEO characteristics, Kubick et al. (2017) provide evidence that equity grant horizons are closely associated with risk incentives, and that extended compensation durations can soften excessive risk-taking.

proves beneficial for firms with limited investment opportunities and increased risk aversion, suggesting that Vega is used to embolden managers to embark on challenging investment ventures.

In the context of our analysis, a key avenue for assessing the influence of executive compensation on risk-taking involves examining how CEOs react to exogenous macroeconomic shocks that affect firms' tangible investments. This analysis holds significant economic and financial relevance, particularly since tangible investments are typically irreversible without incurring substantial losses. Moreover, macroeconomic shocks present relatively brief opportunities for managers to take action. Insights derived from this analysis pertain to both investment and disinvestment decisions: while new investments often represent the primary response to changes in a firm's macroeconomic environment, firms may also divest inefficient operating assets that no longer align with evolving economic realities. Our study focuses on this aspect by investigating managerial responses to investment and disinvestment following exogenous monetary shocks. Specifically, we concentrate on variations in firms' fixed investments, where a significant portion of the risk stems from firms' heavy reliance on monetary policy (Döttling and Ratnovski, 2023).

Moreover, the cyclical nature of such investments renders their financing and profit opportunities increasingly reliant on both current and future monetary policy decisions (Döttling and Ratnovski, 2023). This adds complexity to the decision-making process within firms, particularly as executives must navigate the dynamic effects of monetary policy on asset prices, funding (Jansen and Zervou, 2017; Pascal, 2019), and investment prospects (Adra and Menassa, 2023). As monetary policy assumes a central role in influencing macroeconomic outcomes (El-Erian, 2016; Jacobs and King, 2016), and consequently firms' cost of capital, pivotal decisions regarding changes in tangible investments become more economically significant and, from a risk-taking standpoint, more challenging.

The initial stance of an empiricist might be to argue that Vega's role in driving the investment response to monetary policy is not particularly significant. This is primarily because Vega mainly influences investments in intangibles, which, unlike CAPX, are not as sensitive to monetary policy due to their ineffectiveness as collateral. Indeed, in their analysis of Vega's influence on corporate investments, Coles et al. (2006) demonstrate that Vega's impact is more pronounced in shaping investments in intangibles, such as R&D, rather than in CAPX. They attribute this finding to the fact that investing in intangibles contributes more strongly to firm-level risk. Their results show that while R&D investment increases firm-level risk, CAPX tends to reduce it.

However, it is important to note that, in relative terms, CAPX risk can increase substantially compared to intangibles during periods of strong monetary intervention. This is because the risks associated with intangibles, driven by long-term fundamentals, are relatively independent of the business cycle. In contrast, CAPX is highly sensitive to the business cycle, and monetary policy interventions, which influence this cycle, can heighten CAPX's relative risk. As noted in Section 1, the economic effects of monetary shocks vary over time (Durante et al., 2022; Gambacorta et al., 2014; Pascal, 2019), making it difficult for firms to adjust CAPX effectively to the new economic environment. Overcommitting to CAPX can result in firms holding highly risky, interest-sensitive cyclical assets (Peersman and Smets, 2005). Conversely, reducing CAPX too much may limit a firm's collateral, affecting future borrowing capacity.

In Appendix B, we present strong evidence supporting the view that CAPX risk increases relative to intangibles during periods of strong monetary intervention. Our sample, covering 10,911 firms and 93,307 firm-year observations, shows that, under stronger monetary interventions—measured by the absolute value of the Jarociński and Karadi (2020) monetary shocks—CAPX investments became riskier than intangibles, as reflected in firm-level realized volatility estimates.

Considering that adjusting capital investments in response to expansionary (contractionary) monetary shocks involves added risk, we contend that executive compensation structures incentivizing risk-taking are essential for encouraging firms to pursue value-maximizing adjustments in their investment strategies. We propose that Vega's capacity to counteract the hesitancy induced by Deltas extends seamlessly to the domain of fixed investment reactions to monetary shocks. This leads us to formulate the following prediction:

Empirical Prediction 1: *High CEO compensation Vegas increase firms' capital investment response to monetary shocks.*

It is important to emphasize that the strong influence of Vega in driving a firm's response to monetary shocks, as described in Empirical Prediction 1, cannot be examined in isolation from the firm's broader financial context. As discussed in Section 1, there is growing recognition of the heterogeneous nature of firms' investment reactions to monetary policy, shaped significantly by their financial positions. Studies such as Durante et al. (2022) and Cloyne et al. (2023) show that financially constrained firms tend to exhibit a heightened sensitivity to monetary policy decisions. The rationale behind this perspective is that monetary policy plays a key role in shaping credit costs (Bernanke and Gertler, 1995; Iacoviello and Minetti, 2008; Jiménez et al., 2012), and firms that rely heavily on external credit are more likely to make significant adjustments to their capital investments following monetary shocks.

An alternative perspective, however, is offered by Ottonello and Winberry (2020) who argue that financially flexible firms are more likely to adjust their capital investments in response to monetary policy changes. The reasoning here suggests that financially flexible firms—due to their relatively flatter marginal cost curves—are better positioned to respond to fluctuations in borrowing costs induced by monetary policy shocks. For credit to translate into meaningful changes in capital investment, a firm must face low financing risk, ensuring it can adjust its investments in a timely and flexible manner.

Applied to our analysis, this reasoning implies that the marginal effect of Vega in amplifying capital investments in response to monetary shocks will likely be more pronounced for financially flexible firms. These firms, characterized by lower risk and flatter marginal cost curves, provide greater leeway for risk-taking managers to make substantial adjustments to capital investments. Without sufficient financial flexibility, even risk-oriented managers may find themselves limited in their ability to seize opportunities created by favorable monetary conditions. This insight leads to our second empirical prediction.

Empirical Prediction 2: *Financial flexibility accentuates Vega's ability in shaping the capital investment response to monetary shocks*

2.2. The effectiveness of Vegas and economic uncertainty

An underlying assumption in our emphasis on the effectiveness of Vegas in strengthening the investment response to monetary shocks is that executives accurately identify the risks influencing a firm's financing and business decisions. However, such accuracy can be significantly compromised in an information environment characterized by high uncertainty. The challenges faced by decision-makers in assessing risky outcomes under uncertainty have long been recognized in the early works of Keynes (1921) and Knight (1921). What is common among these classical contributions is the treatment of uncertainty as a situation where emerging unknowns limit both the ability to assign probabilities to outcomes and the overall effectiveness of probabilistic risk identification tools. Shackle (1961, 1992) went even further by advocating for parsimonious decision-making tools that focus exclusively on extreme possibilities rather than probability distributions.

These initial insights have been further developed and refined across various branches of relevant literature. From a psychological perspective, Kahneman et al. (1982) explicitly acknowledge the role of uncertainty in exacerbating both information processing challenges and the influence of biases on decision-making. Subsequently, the behavioral finance literature has offered numerous examples of economically significant decision-making errors that are heightened during periods of uncertainty (Barberis and Thaler, 2003; Lo, 2017; Rost and Osterloh, 2010).

In the context of our analysis, increasing uncertainty may diminish the effectiveness of Vegas in bolstering the investment response to monetary shocks. This is because the inability to evaluate future risks not only impacts firms' investment outcomes but also influences executives' future compensation. Consequently, we anticipate that, despite the heightened incentives for risk-taking, higher Vegas will be less effective in stimulating investment expansion (contraction) in response to expansionary (contractionary) monetary shocks during periods of elevated economic uncertainty. Hence, our third empirical prediction is formulated as follows:

Empirical Prediction 3: *High economic uncertainty limits the effectiveness of CEO compensation Vegas in strengthening firms' capital investment response to monetary shocks.*

3. Identification of Monetary Shocks

The identification of exogenous monetary shocks remains a significant challenge for empiricists. In particular, the main difficulty lies in estimating shocks that are not predicted by existing macroeconomic data and therefore reflect the dimension of monetary policy treated as exogenous from the perspective of investors. A large body of literature addresses this by relying on the immediate reaction of treasury yields to Federal Open Market Committee (FOMC) announcements. The reasoning suggests that treasury yields will only change within this brief window when the Fed's announcement conveys new information not yet processed by investors. Thus, a rise (decline) in treasury yields within the 30-minute window surrounding the FOMC announcement captures unanticipated monetary contraction (expansion) by the Fed.

This high-frequency identification approach has faced increased scrutiny. A substantial body of literature suggests that monetary contractions paradoxically lead to higher growth and inflation expectations (Campbell et al., 2012; Nakamura and Steinsson, 2018). One interpretation of these findings is that monetary shocks contain an informative component, wherein rising (declining) interest rates reflect the Fed's stronger (weaker) confidence in the economic outlook, prompting investors to update their expectations.

To capture the effects of conventional monetary shocks without conflating them with potential Fed information shocks, we employ a monetary shock series based on the one developed by Jarociński and Karadi (2020), which has been used in various studies (Adra and Menassa, 2023; Döttling and Ratnovski, 2023; Durante et al., 2022; Gai a Tong, 2022). A key feature of the (Jarociński and Karadi, 2020) series is its identification of monetary policy shocks using interest rate surprises that are negatively correlated with stock market returns at the time of the FOMC announcement. The authors argue that conventional monetary contraction (expansion) should be associated with a decrease (increase) in stock market valuation, as the market explicitly prices in the potential improvement (deterioration) in credit availability and investment opportunities. Therefore, instead of treating all changes in treasury yields at the time of FOMC announcements as indicators of monetary shocks, the authors focus on 30-minute changes in interest rates that have opposite signs to the changes in the S&P 500's valuation. The monetary shocks, derived from the VAR model of Jarociński and Karadi (2020) and aggregated at the quarterly level, are illustrated in Figure 1.

The pattern observed in these shocks generally corresponds to the Fed's implementation of a countercyclical monetary policy. From 1994 to 2018, the Fed underwent several significant policy phases. In the mid-1990s, the Fed, under Alan Greenspan, raised interest rates to combat inflation pressures stemming from a robust economy. The dot-com bubble of the late 1990s saw further tightening, followed by sharp rate cuts after the bubble burst in 2000-2001 to stimulate the economy in the wake of the recession and the 9/11 attacks. Indeed, the largest expansionary shock observed in Figure 1 occurs in the aftermath of the dot-com bubble burst.

In 2004, rates began to rise again as the economy strengthened, but the 2008 financial crisis triggered the most aggressive expansionary policy in Fed history. As per Figure 1, the second largest expansionary shock occurred in 2008 and was followed by a series of expansionary shocks, as the Fed embarked on an unprecedented round of quantitative easing (QE) programs, purchasing trillions of dollars in mortgage-backed securities and government bonds to stabilize markets and stimulate growth. By 2015, as the economy recovered, the Fed began to taper its QE purchases, eventually phasing out the program, as shown by the small contractionary shocks at the end of our sample period. This is largely due to interest rate normalization which began under Janet Yellen and continued into Jerome Powell's tenure by 2018, as the Fed sought to manage inflation risks without stalling the economic recovery. The most significant expansionary shocks typically occur during periods of economic slack, such as the immediate aftermath of the 2008 financial crisis. Conversely, monetary contraction is more prevalent during periods of economic expansion, notably during the phase-out of quantitative easing measures following the Great Recession. On average, the quarterly shock level is zero, with a standard deviation of 8.4 basis points. In our empirical analysis, we incorporate the standardized version of these shocks where each quarterly level is divided by the sample's standard deviation.

(Insert Figure 1 here)

4. Firm-Level Data and Macroeconomic Controls

4.1. Executive Compensation and Wealth

CEO-level Deltas, Vegas, and wealth levels from 1993 to 2018 are obtained from Professor Lalitha Naveen's webpage, relying on the methodology outlined by Coles et al. (2013, 2006) using the approach of Core and Guay (2002). Professor Naveen's webpage reports the estimates for a handful of executives within the firm. We use the COPEROL identifier to identify the CEO. For each CEO, Delta represents the change in dollar CEO wealth in response to a one percentage point change in the company's share price. Vega, on the other hand, reflects the change in CEO wealth in response to a 0.01 unit change in the annual standard deviation. These estimates are derived using the modification proposed by Merton, (1973) of the Black-Scholes option pricing model to incorporate the impact of dividends. The availability of these estimates largely hinges on the accessibility of executive compensation data from Execucomp and stock return information from CRSP databases. Additionally, it is important to note that the dataset on Professor Lalitha Naveen's webpage follows the convention of excluding utilities and financials. For a more detailed technical breakdown of these variables' constructions, Coles et al., (2013) provide comprehensive insights.

It is worth noting that incorporating annual estimates of variables like executive compensation data into quarterly analyses is not uncommon in the field of corporate finance. In particular, this approach is often used to enrich the analysis and capture long-term trends or characteristics that change less frequently than quarterly financial metrics. For instance, in their analysis of the quarterly changes in variables such as R&D and CAPX, Edmans et al. (2017b) include CEO-compensation-based variables that are available at the end of the previous calendar year. Consequently, as in Edmans et al. (2017b), for each firm in every quarter, we assign the Delta, Vega, and executive wealth levels that are available at the end of the previous calendar year. For example, for each of the quarters of year y, we assign the Delta, Vega, and CEO wealth levels that are computed based on data at the end of year $y-1$.

4.2. Investment and Control Factors

Our initial estimation follows Döttling and Ratnovski (2023) by scaling CAPX by the lagged levels of PPENTQ. This approach treats the ratio as capital expenditure relative to the total capital stock. However, in our robustness checks, we also adopt the method used by Gulen and Ion (2016), where CAPX is divided by the lagged level of total assets. To quantify investment in intangible capital, we follow the method of Peters and Taylor (2017) by including R&D expenditures along with 30% of selling, general, and administrative expenses (SG&A). This measure is then scaled by the firm's total assets.

Appendix A provides a comprehensive description of all the quarterly variables encompassed in our analysis. An initial insight from Table 1 is that the assets share of investments in intangibles is larger than the share of CAPX (0.03 vs. 0.02), reaffirming the insights from Döttling and Ratnovski (2023) that intangibles have morphed into the most dominant form of corporate investments in the U.S. market. Our analysis controls for a diverse set of firm- and economy-related factors. Specifically, we utilize the firm's total assets value at the end of each quarter as a proxy for its size. The firm's financial flexibility is approximated by its leverage level. Quarterly return on assets (RoA) and operating cash flows to assets serve as proxies for accounting performance. Following the approach of Gulen and Ion (2016), we incorporate quarterly sales growth to gauge the firm's commercial performance. Additionally, the attitude towards dividend payments is represented by a dummy variable, assigned a value of 1 if the firm paid dividends over the preceding calendar year and 0 otherwise.

(Insert Table 1 here)

In addition to firm-related factors, our analysis incorporates controls for key economic indicators monitored by the Federal Reserve. These include the unemployment rate and inflation. To assess general economic expectations at the time of the shock, we include the Leading Index for the US economy, as compiled by the Federal Reserve Bank of Philadelphia. Furthermore, we control for the value of the stock market's excess return over the risk-free rate, sourced from Professor Kenneth French's website. These variables provide crucial context for understanding the broader economic environment surrounding the monetary shocks under examination.

For testing our second empirical prediction, we follow Cloyne et al. (2023) by considering the firms that are relatively young (bottom age quartile in our sample) and non-dividend paying to be the most financially constrained.[3] The underlying rationale for

[3] We define the firm's age as the number of years that have elapsed since the IPO.

this measure is that firms in the early stages of their life cycle are likely to face significant constraints, particularly as they refrain from paying dividends in order to progress to the next stage of growth. The use of this compound measure addresses recent concerns that single-dimensional metrics, such as leverage, do not fully capture the extent and complexity of the financial constraints faced by firms (Farre-Mensa et al., 2022). However, to further ensure the robustness of our results, we also investigate whether Vega's role in shaping investment responses is more pronounced when the firm is non-dividend paying and its debt ratio is higher than its average in our sample. The emphasis on the difference between the deviation of the firm's leverage levels from its long-term average follows the emphasis by Ottonello and Winberry (2020) on its role in driving the investment response to monetary shocks.

To test our third empirical prediction, we utilize the macroeconomic uncertainty index developed by Jurado et al. (2015). This index is derived from the common forecasting error over a 12-month horizon, obtained from a comprehensive Vector Autoregression (VAR) model covering a multitude of economic time series. The uncertainty proxy can be accessed on Professor Sydney Ludvigson's webpage. As depicted in Figure 2, the general trend in this index aligns with the intuitive notion of uncertainty increasing during recessionary periods. This trend is particularly pronounced during the period of the 2008 financial crisis. In our firm-level analysis, we compute the quarterly level of the Jurado et al. (2015) index as the estimation in the last calendar month of each quarter.

(Insert Figure 2 here)

5. Empirical Models, Results, and Discussion

5.1. Initial effects of Delta and Vega

To evaluate our first empirical prediction, we examine the effect of monetary shocks on capital expenditures by utilizing the panel-data variant of the Jordà (2005) local projection approach. This methodology has been employed in prior studies such as Jordà et al. (2020), Ottonello and Winberry (2020), and Adra and Menassa (2023), among others. The local projection specification is outlined as follows:

$$\left(\frac{CAPX_{i,t+h}}{AveragePPENTQ_{i,t-1\ to\ t-4}}\right) \times 100$$
$$= \alpha_{i,h} + \alpha_{st,h} + \beta_1^h.MonShock_t + \beta_2^h.MonShock_t \times \ln(CEOVega_{i,t})$$
$$+ \beta_3^h.MonShock_t \times \ln(CEODelta_{i,t}) + f\big(Independent\ CEO\ Vega\ and\ CEO\ Delta\ Effects_{i,t}\big) \quad (1)$$
$$+\ g\big(Firm\ Control\ Variables_{i,t-1}\big) + h(Economic\ Control\ Variables_{t-1}) + \epsilon_{t+h}$$

where $CAPX_{i,t+h}$ represents firm i's capital expenditures in the h^{th} quarter after quarter t in which the monetary shock took place. This quarterly $CAPX_{i,t+h}$ is standardized by $AveragePPENTQ_{i,t-1\ to\ t-4}$, which represents the average net property, plant, and equipment from quarters t–1 to t– 4 before the shock. Accordingly, our local projection analysis tracks the variation in capital investments relative to the pre-shock fixed capital stock.

Our main explanatory variable is the standardized level of monetary shock, $MonShock_t$, which is the quarterly level of the Jarociński and Karadi (2020) conventional monetary shock discussed in Section 3, divided by the standard deviation of this shock in the period covered in our study. Our primary coefficients of interest in Equation (1) are β_2^h and β_3^h that capture the effects of Vega and Delta, respectively, in shaping the relationship between monetary shocks and CAPX. In addition to the lagged effects of firm- and economy-related variables, $\alpha_{st,h}$ is the sector-quarter fixed effect following (Ottonello and Winberry, 2020) and is used to account for the time-varying heterogeneous sectoral exposure to monetary shocks. $\alpha_{i,h}$ is the firm fixed effect. The reported standard errors are based on a two-way clustering by firm and year (Gulen and Ion, 2016). Finally, our estimations also include the main effects of Vegas and Deltas in addition to their interactions with the monetary shock.

In Table 2, the first eight columns present the outcome of Equation (1) for h = 1 to h = 8. In the last column, the dependent variable is the aggregate quarterly CAPX levels from h = 1 to h = 8, scaled by the pre-shock net property, plant, and equipment. The overall evidence from Table 2 strongly supports our first empirical prediction. The conventional effects of monetary shocks, wherein monetary expansion (or contraction) leads to an increase (or decrease) in capital investment, become more pronounced as Vega increases. Specifically, an increase in Vega from the 25th to the 75th percentile of our sample implies that, in response to a one standard deviation expansionary shock, the capital investment rate rises, in aggregate, by roughly a third from 2.48% to 3.21.[4] The evidence from the first three columns indicates that responsiveness is particularly significant in the immediate aftermath of the monetary shock. In later sections, we emphasize the role of financial flexibility in enabling firms to react swiftly to these changes.

Another key insight from the models in Table 2 is that higher Deltas drive the CAPX response to monetary shocks in the opposite direction of Vegas. In particular, an increase in Delta reduces the extent to which the firm expands investment after an expansionary monetary shock. This effect is quantified as follows. For the last column in Table 2, we consider the coefficients of $\mathrm{MonShock_t}$ and $\mathrm{MonShock_t} \times \ln(\mathrm{CEODelta_{i,t}})$, -1.76 and 0.57, respectively. When the CEO Vega is equal to its 25th percentile (77.40), the coefficient value is 0.69% $(-1.79 + 0.57 \times \ln(77.40))$. When the CEO Vega is equal to its 75th percentile (569.75), the coefficient value is 1.83% $(-1.79 + 0.57 \times \ln(569.75))$. Flipping the signs of the effects to cover the case when the shock is expansionary, our evidence indicates that, in response to a standardized expansionary shock, the rate of the investment contraction by the firm increases from 0.69% to 1.83%. This unconventional reaction aligns with the findings of Coles et al. (2006) and Benson et al. (2019), who show that higher Deltas are associated with more risk-averse behavior by corporate managers. In our context, this risk aversion is manifested in the reluctance to carry a strong adjustment in CAPX to accommodate the economic environment shaped by monetary shocks.

In further analysis in the following subsection, after testing Empirical Predictions 2 and 3, we examine how Deltas and Vegas interact to jointly shape the CAPX response to monetary policy. To clearly present our findings in later tables, we follow Döttling and Ratnovski (2023) by reporting our findings at specific horizons. We report the estimation results for horizons $h = 1$, $h = 2$, and $h = 3$, as well as for $h = 6$ and $h = 8$.

(Insert Table 2 here)

[4] This effect is estimated as follows. For the last column in Table 2, we consider the coefficients of $\mathrm{MonShock_t}$ and $\mathrm{MonShock_t} \times \ln(\mathrm{CEOVega_{i,t}})$, -1.76 and -0.29 respectively. When the CEO Vega is equal to the 25th percentile (10.66), the coefficient value is -2.48% $(-1.79 - 0.29 \times \ln(10.66))$. When the CEO Vega is equal to the 75th percentile (129.55), the coefficient value is -3.20% $(-1.79 - 0.29 \times \ln(129.55))$. Flipping the signs of the effects to cover the case when the shock is expansionary, our evidence indicates that, in response to a standardized expansionary shock, the rate of the increase in investment increases from 2.48% to 3.20%, reflecting an increase in sensitivity by 29% (3.20/2.48).

5.2. Vega's influence under financial flexibility, uncertainty, and higher Delta

To test Empirical Prediction 2, we expand our specification in Equation (1) to allow for the interaction between the levels of Vega and $FinConst$, which represents financially constrained firms. Specifically, $FinConst$ is a dummy variable assigned the value of 1 if the firm does not pay dividends in previous calendar year and is in the bottom quartile in terms of age in our sample, i.e. less than sixteen years elapsed between the firm's inclusion in COMPUSTAT and the assigned calendar year. If Empirical Prediction 2 holds, then we expect the strong effect of Vega in accentuating the firm's CAPX response to monetary shocks to be weakened for financially constrained firms. In turn, to test Empirical Prediction 3, we expand our initial specification to include the interactions between Vega and $HighUncertainty$, which is a dummy variable assigned the value of 1 if the Jurado et al. (2015) index exceeds the third quartile in our sample, and 0 otherwise. If Empirical Prediction 3 holds, then we expect the accentuating effects of Vega to be weakened in periods of high economic uncertainty.

Accordingly, we estimate the equation:

$$\begin{aligned}
\left(\frac{CAPX_{i,t+h}}{AveragePPENTQ_{i,t-1\ to\ t-4}}\right) \times 100 \\
&= \alpha_{i,h} + \alpha_{st,h} + \beta_1^h.MonShock_t + \beta_2^h.MonShock_t \times \ln(CEOVega_{i,t}) \\
&+ \beta_3^h.MonShock_t \times \ln\left(CEOVega_{i,t}\right) \times FinConst_{i,t-1} \\
&+ \beta_4^h.MonShock_t \times \ln\left(CEOVega_{i,t}\right) \times HighUncertainty_{i,t-1} \\
&+ \beta_5^h.MonShock_t \times \ln\left(CEODelta_{i,t}\right) + f\left(\ Additional\ Independent\ and\ Interactive\ Effects_{i,t}\right) \\
&+\ g\left(Firm\ Control\ Variables_{i,t-1}\right) + h(Economic\ Control\ Variables_{t-1}) + \epsilon_{t+h}
\end{aligned} \tag{2}$$

The evidence presented in Table 3 strongly supports Empirical Predictions 2 and 3. Regarding financial flexibility, our results indicate that Vega's strong effect in amplifying the investment response to monetary shocks is significantly weakened when the firm is financially constrained. The sum of the coefficients of $\mathrm{MonShock_t}$ and $MonShock_t \times ln(CEOVega_{i,t})$ is -2.90% (-1.94 and -0.96) indicates how the firm's investment response to monetary shocks respond to a one unit increase in *ln(CEOVega)* when the firm is not financially constrained and when uncertainty is low. In the presence of financial constraints, and with low uncertainty, this original effect is cut to -0.97% (-1.94-0.96+1.93).

The findings also support Empirical Prediction 3, showing that high uncertainty further reduces Vega's impact on shaping CAPX responses to monetary shocks. In particular, in the presence of both limited financial flexibility and high economic uncertainty, the sum of the coefficients of $\mathrm{MonShock_t}$, $MonShock_t \times ln(CEOVega_{i,t})$, $MonShock_t \times ln\left(CEOVega_{i,t}\right) \times FinConst_{i,t-1}$, and $MonShock_t \times ln\left(CEOVega_{i,t}\right) \times HighUncertainty_{i,t-1}$ is -0.37% (-1.94-0.96+1.93+0.60), indicating a considerably weaker effect relative to our earlier estimations (-0.37 vs. -2.90). This underscores the idea that Vega's ability to incentivize managers to make risky capital adjustments in response to monetary shocks depends on both financial flexibility and an informational environment where such risks can be identified and, to some extent, measured.

(Insert Table 3 here)

In Table 4, we extend our analysis to explore how Vega and Delta interact in influencing the CAPX response to monetary shocks. Two opposing forces are at play. On one hand, for a given level of Vega, a higher Delta may lead to less risk-taking, thereby limiting Vega's impact on CAPX reactions to monetary shocks. On the other hand, from a marginal perspective, the effect of Vega should be more significant when Delta is high. In other words, Vega's role in encouraging managers to take more risks should be more noticeable when high Delta has already constrained such risk-taking incentives.

$$
\begin{aligned}
&\left(\frac{CAPX_{i,t+h}}{AveragePPENTQ_{i,t-1\ to\ t-4}}\right) \times 100 \\
&\quad = \alpha_{i,h} + \alpha_{st,h} + \beta_1^h . MonShock_t + \beta_2^h . MonShock_t \times \ln(CEOVega_{i,t}) \\
&\quad + \beta_3^h . MonShock_t \times \ln\left(CEOVega_{i,t}\right) \times \ln\left(CEODelta_{i,t}\right) \\
&\quad + \beta_4^h . MonShock_t \times \ln\left(CEOVega_{i,t}\right) \times FinConst_{i,t-1} \\
&\quad + \beta_5^h . MonShock_t \times \ln\left(CEOVega_{i,t}\right) \times HighUncertainty_{i,t-1} \\
&\quad + \beta_6^h . MonShock_t \times \ln\left(CEODelta_{i,t}\right) + f\left(\ Additional\ Independent\ and\ Interactive\ Effects_{i,t}\right) \\
&\quad + \ g\left(Firm\ Control\ Variables_{i,t-1}\right) + h(Economic\ Control\ Variables_{t-1}) + \epsilon_{t+h}
\end{aligned} \tag{3}
$$

Our findings in Table 4 support this second conjecture. Specifically, the effect of Vega in amplifying the CAPX response to monetary shocks is more pronounced when Delta is high. That is, with larger Deltas, the effect of Vega is driving the firm to reduce (or increase) investment in response to contractionary (or expansionary) monetary shocks becomes larger in magnitude. It is also worth noting that the overall accentuating effect of Vega is shaped by the levels of Delta, financial constraints, and economic uncertainty.

(Insert Tables 4 and 5 here)

5.3. Alternative measures and robustness checks

In this section, we discuss a series of robustness checks to support the insights from our initial empirical analysis. The Internet Appendix reports the relevant tables. We start by extending our models to incorporate the CEO's deferred compensation, which we measure as the natural logarithms of both the previous calendar year's delayed compensation and the employer's pension contributions. This variable is constructed using data obtained from the BoardEx database, starting in 1997, resulting in a somewhat smaller subsample. The main finding, reported in Table C1, is that once Vega and Delta are included in the analysis, the effect of deferred compensation on the firm's investment response to monetary shocks becomes statistically and economically insignificant. This suggests that other compensation structures, like Vega and Delta, play a more decisive role in influencing investment decisions. We also adjust Equations (2) by scaling quarterly capital expenditures by the firm's pre-shock assets instead of net property, plant, and equipment. The evidence in Table C2 shows that our conclusions are robust to this alternative scaling method for CAPX.

Furthermore, we extend our analysis to intangible capital investments, scaled by the firm's pre-shock total assets. As discussed in Sections 1, 2, and Appendix B, our empirical predictions are based on the insight that CAPX, rather than intangible assets, (a) are the most responsive to monetary shocks (Döttling and Ratnovski, 2023), and (b) experience a significant increase in relative risk during periods of strong monetary intervention. Therefore, given Vega's role in incentivizing firms to take on riskier investment adjustments, we expect this to be more reflected in changes to CAPX rather than intangible assets.

Our evidence, reported in Table C3, confirms this expectation. In particular, the coefficients representing the accentuating effects of Vega (β_2^h), and the role of financial constraints (β_3^h)and uncertainty (β_4^h) in weakening this role, are considerably smaller, than the corresponding coefficients in Equation (3). It is also worth noting that the statistical significance of these coefficients is also considerably weaker. This reinforces our hypothesis that CAPX, rather than intangible assets, is more responsive to monetary shocks, with Vega's influence being larger in magnitude in the case of CAPX.

We re-estimate Equation (2) using an alternative proxy for financial constraints. While we continue to focus on non-dividend-paying firms, we incorporate the Ottonello and Winberry (2020) measure of abnormal leverage. This measure captures the difference between a firm's leverage ratio and the corresponding sample average. Firms with leverage ratios above the sample average are considered less financially flexible relative to their long-term fundamentals. Accordingly, in our estimations, $FinConst2_{i,t-1}$ is a dummy variable assigned the value of 1 if the firm is non-divided paying and has an abnormal leverage ratio exceeding the median on our sample, and 0 otherwise. The evidence reported in Table C4 is consistent with our prior results, emphasizing the role of tight financial constraints in limiting Vega’s ability to accentuate the firm’s CAPX response to monetary shocks.

Additionally, we expand our analysis to incorporate additional corporate governance-related factors. Our aim is to examine whether Vega’s effect – and the roles of financial constraints, uncertainty, and Deltas – in shaping the in CAPX response to monetary shocks remain significant after controlling for additional corporate governance measures. The addition of monitoring mechanisms in firms is a common strategy to align the interests of top-level executives with those of shareholders, as highlighted by prior research (Sauerwald and Su, 2019). To assess the robustness of our insights in light of varying degrees of corporate governance in firms, we expand the specification in Equation (2) by including additional independent and interaction effects of key corporate governance metrics: board size (Eisenberg et al., 1998; Ferreira et al., 2011), takeover threats (Cain et al., 2017), and corporate CSR scores (Russo and Perrini, 2010), which have been reported to drive firms’ performance in the literature.

The evidence presented in Table C5 further strengthens our previous findings, confirming that Vega amplifies the firm's investment response to monetary shocks, while financial constraints and high uncertainty play a limiting role in moderating this effect. Additionally, it is important to highlight that Vega's influence is further weakened in firms with larger boards and significant involvement in CSR (corporate social responsibility) initiatives. A larger board may impose greater oversight, thereby curbing the tendency to pursue risky investment strategies. At the same time, substantial engagement in CSR activities suggests that the firm prioritizes broader, long-term objectives over immediate investment adjustments in response to monetary shocks, which could temper the short-term risk-taking behaviors typically associated with Vega-driven incentives.

To further assert the robustness of our empirical findings, we explicitly consider the effects of within-firm variation in the executive compensation structure. Table C6 presents a modified version of our estimations where Vegas and Deltas are replaced by abnormal Vegas and abnormal Deltas, respectively. These abnormal measures capture the deviation of executive compensation from their expected values. These expected values are derived from models that explain the executive Vega and Delta levels, separately, using firm- and economy-related factors covered in our analysis. The local projection results in Table IA6 are consistent with our original conclusions, reinforcing the view that abnormal Vegas significantly influence the CAPX response to monetary shocks. Moreover, this effect is shaped by the firm's financial constraints, economic uncertainty, and Delta levels.

In summary, our findings provide empirical evidence linking the structure of executive compensation with firms' fixed investment reaction to monetary policy. By placing executive compensation and firm-level incentives at the crux of the response to monetary policy, our study bridges the gap between the literature on corporate governance and the literature on the investment response to monetary policy. This opens up new avenues for exploration and provides insight into the microeconomic mechanisms that develop in response to macroeconomic shocks, benefiting both shareholders and policymakers.

6. Conclusion

In this paper, we contend that a robust investment response to monetary shocks necessitates an executive compensation structure that incentivizes risk-taking, given the additional risks firms face in the aftermath of such shocks. Our empirical findings highlight the significant influence of executive compensation's sensitivity to firms' stock volatility (Vega) in strengthening firms' investment reactions to monetary policy. We show that these effects are pronounced in the case of CAPX, whose relative riskiness compared to intangibles increases significantly during periods of strong monetary interventions. Furthermore, we show that a firm's financial flexibility and relatively low economic uncertainty strengthen the effect of Vega in driving the firm's CAPX response to monetary shocks. This Vega effect also partly offsets the risk-aversion-increasing influence of corporate executive compensation's sensitivity to stock performance, Delta.

Our findings are robust to alternative ways of scaling the level of capital investment, the focus on CEO compensation instead of aggregate executive compensation, and the control of multiple firm- and governance-related factors. Overall, our paper contributes to a growing body of literature highlighting the macroeconomic implications of key microeconomic considerations within firms. Additionally, our findings offer fresh insights into the corporate governance literature by elucidating how executives' risk-taking incentives manifest in the investment response to monetary policy. In doing so, our paper is one of the early attempts to place corporate governance considerations at the heart of the analysis of firms' responses to a consequential macroeconomic force like monetary policy. In this paper, we contend that a robust investment response to monetary shocks necessitates an executive compensation structure that incentivizes risk-taking, given the additional risks firms face in the aftermath of such shocks. Our empirical findings highlight the significant influence of executive compensations' sensitivity to firms' stock volatility (Vega) over their sensitivity to firms' stock prices (Delta) in shaping firms' investment reaction to monetary policy. Moreover, we underscore the importance of Vegas by demonstrating that the investment channel of monetary policy, which examines the link between abnormal leverage and investment, is only effective under sufficiently high levels of Vega.

Furthermore, our research reveals that the effectiveness of Vega in driving a strong investment response to monetary shocks is contingent upon the prevailing degree of uncertainty being relatively low. This allows executives to accurately identify the risks shaping both firm value and their own compensation. Overall, our paper contributes to a growing body of literature highlighting the macroeconomic implications of key microeconomic considerations within firms. Additionally, our findings offer fresh insights into the corporate governance literature by elucidating how executives' risk-taking incentives manifest in the investment response to monetary policy.

Appendix A: Variables' definitions

Table A: Variables' descriptions and sources

Variable	Description	Source
CEODelta	The total change in the CEO's wealth (in thousands of dollars) in response to a 1% increase in the stock price.	Professor Lalitha Naveen's Website + Execucomp
CEOVega	The total change in the CEO's wealth (in thousands of dollars) in response to a 0.01 unit increase in the firm's stock volatility.	Professor Lalitha Naveen's Website + Execucomp
CEODeferredCompensation	The natural logarithm of (CEO Contingent Compensation + Employer Pension Contribution).	BoardEx
AbnormalCEODelta	The difference between the natural logarithm of the firm's CEO Delta and its predicted value.	Professor Lalitha Naveen's Website + Authors' Calculation
AbnormalCEOVega	The difference between the natural logarithm of the firm's CEO Vega and its predicted value.	Professor Lalitha Naveen's Website + Authors' Calculation
CEOWealth	Total value of the executives' stock and option portfolios.	Professor Lalitha Naveen's Website
MonShock	The exogenous monetary shock series developed by Jarociński and Karadi (2020), divided by its standard deviation throughout the period covered in this paper.	Jarociński and Karadi (2020)
FinConst	Dummy = 1 if the firm has not paid dividends over the last calendar year and is in the bottom quartile in terms of age distribution, and 0 otherwise. Age is defined as the number of years from the IPO to the corresponding calendar year.	COMPUSTAT
FinConst2	Dummy = 1 if the firm has not paid dividends over the last calendar year and has an abnormal leverage level that exceeds the median in our sample, and 0 otherwise.	COMPUSTAT
Uncertainty	The value of the Jurado et al. (2015) 12-months-ahead macroeconomic uncertainty index at the end of each quarter.	Professor Sydney Ludvigson's website
HighUncertainty	Dummy=1 if *Uncertainty* exceeds the third quartile in the sample, and 0 otherwise.	Professor Sydney Ludvigson's website
CAPX	The quarterly level of capital expected.	COMPUSTAT
PPENTQ	The natural logarithm of the annual value of capital expenditures for each firm, in millions of dollars.	COMPUSTAT
Assets	The natural logarithm of the annual value of recorded assets for each firm, in millions of dollars.	COMPUSTAT
RoA	The firm's quarterly returns on assets.	COMPUSTAT
Debt	The total debt as a percentage of the total assets.	COMPUSTAT
Div	Dummy = 1 if the firm paid dividends over the last year, and 0 otherwise.	COMPUSTAT
Age	Number of years from the year of the IPO to the corresponding calendar year.	COMPUSTAT
SalesGrowth	The growth in the firm's sales during the quarter.	COMPUSTAT
CashFlow	The firm's quarterly operating cash flows as a percentage of the level of assets at the beginning of the quarter.	COMPUSTAT
LeadingIndex	The leading index of the US economy, estimated by combining multiple state-level indices. For each state, the leading index predicts over a six-month horizon the growth rate of the coincident index. The models include covers variables that lead the economy: state-level housing permits, initial unemployment insurance claims, delivery times from the Institute for Supply Management (ISM) manufacturing survey, and interest	Federal Reserve Bank of Philadelphia, Leading Index for the United States [USSLIND], retrieved from FRED, Federal Reserve Bank of St. Louis.

	rates spread between the 10-year Treasury bond and the 3-month Treasury bill.	
Unemployment	The level of the U.S. unemployment rate at the quarter.	U.S. Bureau of Labor Statistics, Unemployment Rate [UNRATE], retrieved from FRED, Federal Reserve Bank of St. Louis.
CPI	The Consumer Price Index at the end of the quarter.	U.S. Bureau of Labor Statistics, Consumer Price Index for All Urban Consumers: All Items in U.S. City Average [CPIAUCSL], retrieved from FRED, Federal Reserve Bank of St. Louis
StockMarket	excess return on the market, value-weight return of all CRSP firms incorporated in the US and listed on the NYSE, AMEX, or NASDAQ that have a CRSP share code of 10, minus the one-month risk-free rate.	Professor Kenneth French's Website
LargeBoard	Dummy=1 if the number of individuals in the board is above the median in the BoardEx database, and 0 otherwise.	BoardEx
TakeoverIndex	The takeover index of Cain et al. (2017).	Professor Stephen McKeon's Website
HighCSR	Corporate governance score from Refinitiv database.	Refinitiv

Notes: This table presents the name, description, and source of each variable used in our empirical analysis.

Appendix B: The Effects of Monetary Interventions on Stock Volatility

In this appendix, we estimate the effects of monetary interventions on firm-level volatility, focusing on how different types of investments influence a firm's risk profile. Our sample includes all non-financial firms from COMPUSTAT that have daily stock price data available in CRSP, spanning the years 1994 to 2018, and covering 10,911 firms with 93,307 firm-year observations. The dependent variable in Table A2.1 is the annual level of realized stock volatility, as estimated by Alfaro, Bloom, and Lin (2018) and publicly accessible on policyuncertainty.com. We calculate the level of monetary intervention using the absolute value of the annual sum of Jarociński and Karadi's (2020) monthly shocks, scaled by the standard deviation in our sample.

The evidence in Column (1), which shows the baseline specification, aligns with the findings of Coles et al. (2006). It suggests that investments in intangibles (such as R&D) increase firm-level risk, whereas investments in CAPX (capital expenditures) reduce risk. However, the results in Column (2) show that during periods of strong monetary interventions, the relative riskiness of CAPX investments increases significantly, while the riskiness of intangible investments decreases.

For example, in the absence of monetary interventions, a 10% CAPX investment rate is, on average, associated with a 1.2% decrease in stock volatility. However, this reduction diminishes considerably under stronger monetary interventions. Similarly, without monetary interventions, a 10% investment rate in intangible capital is associated with a 0.6% increase in stock volatility, but this effect also weakens with stronger monetary interventions. Indeed, when the size of monetary interventions exceeds 1.5 standard deviations, CAPX becomes riskier than intangibles. Consequently, during periods of strong monetary intervention, the relative riskiness of CAPX compared to intangible investments rises. In the main text of the paper, we discuss the reasons for these shifts in relative riskiness, largely attributing them to the significant impact of monetary policy on the business cycle and interest-sensitive assets. Our models control for a range of firm-specific factors such as size, cash ratio, and RoA.

Table B: The effect of monetary policy inventions on the stock volatility, with emphasis on the role of the firm's CAPX and intangible investment

Explanatory \ Dependent	$Volatility_t$	$Volatility_t$
$CAPXRate_t$	-7.314***	-12.197***
	(2.429)	(2.750)
$CAPXRate_t \times MonetaryIntervention_t$		8.476***
		(1.659)
$IntangiblesRate_t$	1.758**	6.359***
	(0.860)	(1.083)
$IntangiblesRate_t \times Monetary\ Intervention_t$		-4.494***
		(0.495)
$MonetaryIntervention_t$	-21.486***	-21.156***
	(1.037)	(1.042)
$\ln(Assets_{i,t})$	0.115	0.250
	(0.206)	(0.207)
$RoA_{i,t}$	-1.188***	-1.215***
	(0.166)	(0.166)
$Debt_{i,t}$	2.266***	2.281***
	(0.289)	(0.289)
$Cash_{i,t}$	-8.947***	-8.899***
	(1.113)	(1.113)
Firm Effects	YES	YES
Year Effects	YES	YES
N	93,307	93,307
Adjusted R-Squared	0.26	0.26

Note: This table presents two models examining how the firm-level stock volatility responds to monetary interventions. The dependent variable in these models is the firm's annual realized stock volatility estimated by Alfaro et al. (2018). The primary independent variable, in turn, is the level of net monetary intervention calculated as the absolute value of the Jarociński and Karadi (2020) monetary shocks. Column (1) presents a baseline specification while Column (2) extends this specification to allow for interactive effects with the type of investment. ***, **, and * represent significant at the 1%, 5%, and 10% level, respectively.

Appendix C: Robustness and Alternative Specifications

Table C1: The effects of monetary shocks on capital investment with emphasis on the role of CEO compensation Deltas, Vegas, and deferred compensation

Explanatory Variables \ Horizon	$h = 1$	$h = 2$	$h = 3$	$h = 6$	$h = 8$	Aggregate Effect
$MonShock_t$	-0.102	-0.324***	-0.142	-0.291	-0.434	-2.219**
	(0.118)	(0.133)	(0.147)	(0.231)	(0.273)	(1.125)
$MonShock_t \times \ln(CEOVega_{i,t})$	-0.132***	-0.145***	-0.185***	-0.050	-0.271***	-0.908***
	(0.040)	(0.040)	(0.041)	(0.067)	(0.074)	(0.261)
$MonShock_t \times \ln(CEOVega_{i,t}) \times FinConst_{i,t-1}$	-0.033***	0.089*	0.083***	0.471***	0.387***	1.577***
	(0.013)	(0.046)	(0.023)	(0.122)	(0.138)	(0.511)
$MonShock_t \times \ln(CEOVega_{i,t}) \times HighUncertainty_{t-1}$	0.094***	0.011	0.062***	0.050	0.306***	0.521***
	(0.030)	(0.010)	(0.021)	(0.070)	(0.081)	(0.187)
$MonShock_t \times \ln(CEOVega_{i,t}) \times CEODeferredCompensation_{i,t-1}$	0.011	0.001	0.001	0.001	0.001	0.001
	(0.010)	(0.011)	(0.012)	(0.014)	(0.014)	(0.016)
$MonShock_t \times \ln(CEODelta_{i,t})$	0.111***	0.164***	0.155***	0.061	-0.013	0.848***
	(0.037)	(0.042)	(0.049)	(0.073)	(0.085)	(0.302)
Control Factors	YES	YES	YES	YES	YES	YES
Sector-Time Effects	YES	YES	YES	YES	YES	YES
Firm Effects	YES	YES	YES	YES	YES	YES
N	42165	41210	40134	37030	35086	35086
Adjusted R-Squared	0.10	0.10	0.11	0.11	0.13	0.13

Note: This table tracks the evolution of the monetary shock's impact on the firm's capital investment over an eight-quarter horizon. These models emphasize influence of the CEO's compensation structure on this investment reaction while depicting how Vega's role in this reaction is shaped by financial constraints, economic uncertainty, and the deferred compensation. Columns 1 to 5 present estimations for a modified version of Equation (2) that, in addition to using the CEO Deltas and Vegas, also covers the CEO's deferred compensation. We provide results for $h = 1$, $h = 2$, $h = 3$, $h = 6$, and $h = 8$, respectively. Column 6 represents estimation of the aggregated effects from $h = 1$ to $h = 8$, inclusive). Two-way clustered standard errors are reported within the parentheses. Our results remain robust when considering alternatives by firm, sector, and sector-year. All variables are defined in Table 1. ***, **, and * represent significant at the 1%, 5%, and 10% level, respectively.

Table C2: The effects of monetary shocks on capital investment scaled by the firm's total assets

Explanatory Variables \ Horizon	$h = 1$	$h = 2$	$h = 3$	$h = 6$	$h = 8$	Aggregate Effect
$MonShock_t$	-0.003	-0.050	0.029	-0.023	-0.091	-0.281
	(0.034)	(0.037)	(0.040)	(0.054)	(0.061)	(0.247)
$MonShock_t \times \ln(CEOVega_{i,t})$	-0.020***	-0.021***	-0.016*	-0.010	-0.029**	-0.102**
	(0.007)	(0.008)	(0.009)	(0.011)	(0.013)	(0.053)
$MonShock_t \times \ln(CEOVega_{i,t}) \times FinConst_{i,t-1}$	0.029***	-0.030***	0.005	0.010	0.101***	0.187*
	(0.013)	(0.014)	(0.016)	(0.021)	(0.024)	(0.095)
$MonShock_t \times \ln(CEOVega_{i,t}) \times HighUncertainty_{t-1}$	0.015**	0.019**	0.016*	0.007	0.020	0.146**
	(0.007)	(0.009)	(0.009)	(0.013)	(0.015)	(0.059)
$MonShock_t \times \ln(CEODelta_{i,t})$	0.008*	0.016***	0.013***	0.009	0.015*	0.096***
	(0.005)	(0.005)	(0.006)	(0.007)	(0.008)	(0.034)
Control Factors	YES	YES	YES	YES	YES	YES
Sector-Time Effects	YES	YES	YES	YES	YES	YES
Firm Effects	YES	YES	YES	YES	YES	YES
N	69550	68014	66162	60742	57299	57299
Adjusted R-Squared	0.10	0.10	0.11	0.11	0.13	0.13

Note: This table tracks the evolution of the monetary shock's impact on the firm's capital investment over an eight-quarter horizon. In this table, the level of capital investment in each quarter is scaled by the firm's pre-shock level of total assets. These models emphasize influence of the CEO compensation structure on this investment reaction while depicting how Vega's role in this reaction is shaped by financial constraints and economic uncertainty. Columns 1 to 5 present estimations for $h = 1$, $h = 2$, $h = 3$, $h = 6$, and $h = 8$, respectively. Column 6 represents estimation of the aggregated effects from $h = 1$ to $h = 8$, inclusive. Two-way clustered standard errors are reported within the parentheses. Our results remain robust when considering alternatives by firm, sector, and sector-year. All variables are defined in Appendix A. ***, **, and * represent significant at the 1%, 5%, and 10% level, respectively.

Table C3: CEO compensation and the local projection effects of monetary shocks on intangibles investment

Explanatory Variables \ Horizon	$h = 1$	$h = 2$	$h = 3$	$h = 6$	$h = 8$	Aggregate Effect
$MonShock_t$	-0.046	-0.029	0.061	0.012	0.021	0.140
	(0.059)	(0.070)	(0.074)	(0.099)	(0.135)	(0.501)
$MonShock_t \times \ln(CEOVega_{i,t})$	-0.007	-0.012	-0.012	-0.016	-0.019	-0.084
	(0.015)	(0.018)	(0.019)	(0.026)	(0.035)	(0.130)
$MonShock_t \times \ln(CEOVega_{i,t}) \times FinConst_{i,t-1}$	0.017	0.017	0.013	0.048*	0.031	0.082
	(0.016)	(0.019)	(0.020)	(0.026)	(0.036)	(0.133)
$MonShock_t \times \ln(CEOVega_{i,t}) \times HighUncertainty_{t-1}$	-0.001	0.013	0.017	0.009	0.015	0.056
	(0.010)	(0.011)	(0.012)	(0.016)	(0.022)	(0.083)
$MonShock_t \times \ln(CEODelta_{i,t})$	0.002	0.017	0.012	0.004	0.003	0.020
	(0.010)	(0.012)	(0.012)	(0.016)	(0.022)	(0.082)
Control Factors	YES	YES	YES	YES	YES	YES
Sector-Time Effects	YES	YES	YES	YES	YES	YES
Firm Effects	YES	YES	YES	YES	YES	YES
N	69550	68014	66162	60742	57299	57299
Adjusted R-Squared	0.32	0.33	0.33	0.35	0.36	0.36

Note: This table tracks the evolution of the monetary shock's impact on the firm's investment in intangibles over an eight-quarter horizon, with emphasis on the role of CEO compensation structure, as suggested by Equation (4). Columns 1 to 5 present estimations for $h = 1$, $h = 2$, $h = 3$, $h = 6$, and $h = 8$, respectively. Column 6 represents estimation of the aggregated effects from $h = 1$ to $h = 8$, inclusive. Two-way clustered standard errors are reported within the parentheses. Our results remain robust when considering alternatives by firm, sector, and sector-year. All variables are defined in Appendix A. ***, **, and * represent significant at the 1%, 5%, and 10% level, respectively.

Table C4: CEO compensation and the local projection effects of monetary shocks using an alternative proxy for financial constraints

Explanatory Variables \ Horizon	$h = 1$	$h = 2$	$h = 3$	$h = 6$	$h = 8$	Aggregate Effect
$MonShock_t$	-0.003	-0.343	-0.007	-0.309	-0.251	-1.911
	(0.216)	(0.215)	(0.250)	(0.351)	(0.352)	(1.439)
$MonShock_t \times \ln(CEOVega_{i,t})$	-0.067***	-0.063**	-0.097*	-0.031	-0.229***	-0.802***
	(0.026)	(0.027)	(0.053)	(0.074)	(0.075)	(0.305)
$MonShock_t \times \ln(CEOVega_{i,t}) \times FinConst2_{i,t-1}$	0.101**	0.142**	0.054	0.001	0.238***	0.804**
	(0.050)	(0.073)	(0.085)	(0.124)	(0.080)	(0.422)
$MonShock_t \times \ln(CEOVega_{i,t}) \times HighUncertainty_{t-1}$	0.142***	0.121***	0.093	0.034	0.125**	0.715**
	(0.030)	(0.031)	(0.048)	(0.053)	(0.063)	(0.341)
$MonShock_t \times \ln(CEODelta_{i,t})$	0.040	0.101***	0.091***	0.049	0.056	0.528***
	(0.029)	(0.029)	(0.033)	(0.048)	(0.047)	(0.194)
Control Factors	YES	YES	YES	YES	YES	YES
Sector-Time Effects	YES	YES	YES	YES	YES	YES
Firm Effects	YES	YES	YES	YES	YES	YES
N	69550	68014	66162	60742	57299	57299
Adjusted R-Squared	0.10	0.10	0.11	0.11	0.13	0.13

Note: This table tracks the evolution of the monetary shock's impact on the firm's capital investment over an eight-quarter horizon. These models emphasize influence of the CEO's compensation structure on this investment reaction while depicting how Vega's role in this reaction is shaped by financial constraints, economic uncertainty, and the level of Delta. In Panel A, Columns 1 to 5 present estimations for a modified version of Equation (2) where the firm's level of financial constraints is presented by $FinConst2_{i,t-1}$, which is a dummy variable assigned the value of 1 if the firm is non-divided paying and has an abnormal leverage ratio exceeding the median in our sample, and 0 otherwise.. We provide results for $h = 1, h = 2, h = 3, h = 6$, and $h = 8$, respectively. Column 6 represents estimation of the aggregated effects from $h = 1$ to $h = 8$, inclusive. Two-way clustered standard errors are reported within the parentheses. Our results remain robust when considering alternatives by firm, sector, and sector-year. All variables are defined in Appendix A. ***, **, and * represent significant at the 1%, 5%, and 10% level, respectively.

Table C5: The effects of monetary shocks on capital investment with additional controls related to corporate governance

Explanatory Variables \ Horizon	$h = 1$	$h = 2$	$h = 3$	$h = 6$	$h = 8$	Aggregate Effect
$MonShock_t$	0.367	-0.261	-0.456	-0.279	-0.037	-2.113
	(0.490)	(0.431)	(0.491)	(0.629)	(0.591)	(2.697)
$MonShock_t \times \ln(CEOVega_{i,t})$	-0.090***	-0.177***	-0.125***	-0.013	-0.226***	-1.429***
	(0.028)	(0.032)	(0.038)	(0.062)	(0.071)	(0.196)
$MonShock_t \times \ln(CEOVega_{i,t}) \times FinConst_{i,t-1}$	0.161***	0.106***	0.078	0.035	0.144***	0.813***
	(0.050)	(0.044)	(0.050)	(0.054)	(0.059)	(0.278)
$MonShock_t \times \ln(CEOVega_{i,t}) \times HighUncertainty_{t-1}$	0.059**	0.067**	0.029	0.059	0.129***	0.712***
	(0.029)	(0.034)	(0.039)	(0.049)	(0.046)	(0.209)
$MonShock_t \times \ln(CEODelta_{i,t})$	-0.057	0.066	0.041	0.067	0.033	0.431
	(0.084)	(0.074)	(0.084)	(0.107)	(0.101)	(0.458)
$MonShock_t \times HighCSR_{i,t}$	-0.116	0.135	0.293**	0.055	0.129	1.167*
	(0.124)	(0.109)	(0.125)	(0.158)	(0.149)	(0.678)
$HighCSR_{i,t}$	0.175	-0.250	-0.497***	-0.803***	-0.513**	-3.178***
	(0.187)	(0.165)	(0.186)	(0.237)	(0.226)	(1.032)
$MonShock_t \times TakeoverIndex_{i,t}$	-0.602	-0.570	0.274	-0.446	-0.451	-2.040
	(0.713)	(0.627)	(0.715)	(0.902)	(0.844)	(3.849)
$TakeoverIndex_{i,t}$	-7.665***	-6.209***	-4.274*	-0.783	2.985	-31.009**
	(2.518)	(2.210)	(2.367)	(3.223)	(3.362)	(15.486)
$MonShock_t \times LargeBoard_{i,t}$	0.269**	0.230**	0.093	0.124	-0.007	0.935
	(0.123)	(0.109)	(0.124)	(0.157)	(0.147)	(0.670)
$LargeBoard_{i,t}$	0.387**	0.219	0.258	0.276	0.147	2.504***
	(0.185)	(0.163)	(0.185)	(0.235)	(0.224)	(1.020)
Control Factors	YES	YES	YES	YES	YES	YES
Sector-Time Effects	YES	YES	YES	YES	YES	YES
Firm Effects	YES	YES	YES	YES	YES	YES
N	35135	34853	34489	33882	33216	33216
Adjusted R-Squared	0.01	0.010	0.010	0.010	0.014	0.02

Note: This table tracks the evolution of the monetary shock's impact on the firm's capital investment over an eight-quarter horizon. The additional feature of the models covered in this table is the control for the effect of additional factors related corporate governance, including the size of the board, takeover vulnerability, and CSR engagement. Columns 1 to 5 present estimations for $h = 1$, $h = 2$, $h = 3$, $h = 6$, and $h = 8$, respectively. Column 6 represents estimation of the aggregated effects from $h = 1$ to $h = 8$, inclusive. Two-way clustered standard errors are reported within the parentheses. Our results remain robust when considering alternatives by firm, sector, and sector-year. All variables are defined in Appendix A. ***, **, and * represent significant at the 1%, 5%, and 10% level, respectively.

Table C6: The effects of monetary shocks on capital investment using abnormal vegas and deltas

Explanatory Variables \ Horizon	$h = 1$	$h = 2$	$h = 3$	$h = 6$	$h = 8$	Aggregate Effect
$MonShock_t$	0.102***	0.104***	0.057	-0.039	-0.077	0.331
	(0.040)	(0.041)	(0.046)	(0.067)	(0.075)	(0.275)
$MonShock_t \times \ln(AbnormalCEOVega_{i,t})$	-0.256***	-0.094	-0.175***	-0.385***	-0.612***	-2.010***
	(0.061)	(0.061)	(0.071)	(0.103)	(0.116)	(0.429)
$MonShock_t \times \ln(AbnormalCEOVega_{i,t}) \times FinConst_{i,t-1}$	0.316**	0.396***	0.830***	1.599***	1.548***	6.893***
	(0.129)	(0.130)	(0.148)	(0.211)	(0.235)	(0.868)
$MonShock_t \times \ln(AbnormalCEOVega_{i,t}) \times HighUncertainty_{t-1}$	0.287***	0.087	0.180**	0.499***	0.523***	2.111***
	(0.060)	(0.070)	(0.080)	(0.099)	(0.100)	(0.467)
$MonShock_t \times \ln(AbnormalCEODelta_{i,t})$	0.054	0.140***	0.076	-0.082	-0.247***	0.563**
	(0.049)	(0.049)	(0.056)	(0.080)	(0.089)	(0.229)
Control Factors	YES	YES	YES	YES	YES	YES
Sector-Time Effects	YES	YES	YES	YES	YES	YES
Firm Effects	YES	YES	YES	YES	YES	YES
N	35135	34853	34489	33882	33216	33216
Adjusted R-Squared	0.09	0.04	0.06	0.06	0.14	0.14

Note: This table tracks the evolution of the monetary shock's impact on the firm's capital investment over an eight-quarter horizon. Columns 1 to 5 present estimations from a modified version of Equation (2) when the CEO Delta and Vega levels are replaced by their abnormal levels. The estimations are presented for $h = 1$, $h = 2$, $h = 3$, $h = 6$, and $h = 8$, respectively. Column 6 represents estimation of the aggregated effects from $h = 1$ to $h = 8$, inclusive. Two-way clustered standard errors are reported within the parentheses. Our results remain robust when considering alternatives by firm, sector, and sector-year. All variables are defined in Appendix A. ***, **, and * represent significant at the 1%, 5%, and 10% level, respectively.

References

Adra, S. (2022). Monetary Policy and Anxious Presidents: The Effects of Monetary Shocks on Presidential Job Approval. Politics and Policy, 50(2), 244–273.

Adra, S., Barbopoulos, L., & Saunders, A. (2020). The Impact of Monetary Policy on M&A Outcomes. Journal of Corporate Finance, 62, 101529.

Adra, S., & Menassa, E. (2023). Uncertainty and Corporate Investments in Response to the Fed's Dual Shocks. Financial Review, 58(3), 463–484.

Alfaro, I., Bloom, N., & Lin, X. (2018). The Finance Uncertainty Multiplier. National Bureau of Economic Research, No. w24571.

Barakchian, S. M., & Crowe, C. (2013). Monetary Policy Matters: Evidence from New Shocks Data. Journal of Monetary Economics, 60(8), 950–966.

Barberis, N., & Thaler, R. H. (2003). A Survey of Behavioral Finance. Handbook of the Economics of Finance, 1, 1053–1128.

Benson, B. W., James, H. Li., & Park, J. C. (2019). Heterogeneity in the Effect of Managerial Equity Incentives on Firm Value. The Financial Review, 54, 583–638.

Bernanke, B., & Gertler, M. (1995). Inside the Black Box: The Credit Channel of Monetary Policy Transmission. Journal of Economic Perspectives, 9(4), 27–48.

Bernanke, B., & Kuttner, K. N. (2005). What Explains the Stock Market's Reaction to Federal Reserve Policy? Journal of Finance, 60, 1221–1257.

Bernile, G., Bhagwat, V., & Rau, P. R. (2017). What Doesn't Kill You Will Only Make You More Risk-Loving: Early-Life Disasters and CEO Behavior. The Journal of Finance, 72, 167–206.

Boivin, J., Kiley, M. T., & Mishkin, F. S. (2010). How Has the Monetary Transmission Mechanism Evolved over Time? In Handbook of Monetary Economics Vol 3 (pp. 369–422). Elsevier.

Brockman, P., Martin, X., & Unlu, E. (2010). Executive Compensation and the Maturity Structure of Corporate Debt. Journal of Finance, 65(3), 1123–1161.

Cain, M. D., McKeon, S. B., & Davidoff, S. (2017). Do Takeover Laws Matter? Evidence from Five Decades of Hostile Takeovers. Journal of Financial Economics, 124(3), 464–485.

Campbell, J. R., Evans, C. L., Fisher, J. D., Justiniano, A., Calomiris, C. W., & Woodford, M. (2012). Macroeconomic Effects of Federal Reserve Forward Guidance [with Comments and Discussion]. Brookings Papers on Economic Activity, 1–80.

Carline, N. F., Pryshchepa, O., & Wang, B. (2023). CEO Compensation Incentives and Playing It Safe: Evidence from FAS 123R. Journal of Financial and Quantitative Analysis, 58(7), 2993-3026.

Chen, Y., Fan, Q., Yang, X., & Zolotoy, L. (2021). CEO Early-Life Disaster Experience and Stock Price Crash Risk. Journal of Corporate Finance, 68(101928).

Cloyne, J., Ferreira, C., Froemel, M., & Surico, P. (2023). Monetary Policy, Corporate Finance and Investment. Journal of the European Economic Association, 21(6), 2586–2634.

Coles, J. L., Daniel, N. D., & Naveen, L. (2006). Managerial Incentives and Risk-Taking. Journal of Financial Economics, 79, 431–468.

Coles, J. L., Daniel, N. D., & Naveen, L. (2013). Calculation of Compensation Incentives and Firm-related Wealth using Execucomp: Data, Program, and Explanation. Working Paper.

Core, J., & Guay, W. (2002). Estimating the Value of Employee Stock Option Portfolios and Their Sensitivities to Price and Volatility. Journal of Accounting Research, 40(3), 613–630.

Dixit, A. K., & Pindyck, R. S. (1994). Investment Under Uncertainty. Princeton University Press.

Döttling, R., & Ratnovski, L. (2023). Monetary Policy and Intangible Investment. Journal of Monetary Economics, 134, 53–72.

Durante, E., Ferrando, A., & Vermeulen, P. (2022). Monetary Policy, Investment and Firm Heterogeneity. European Economic Review, 148, 104251.

Edmans, A., & Gabaix, X. (2009). Is CEO Pay Really Inefficient? A Survey of New Optimal Contracting Theories. European Financial Management, 15(3), 486–496.

Edmans, A., & Gabaix, X. (2016). Executive Compensation: A Modern Primer. Journal of Economic Literature, 54(4), 1232–1287.

Edmans, A., Fang, V. W., & Lewellen, K. A. (2017a). Equity Vesting and Investment. The Review of Financial Studies, 30(7), 2229–2271.

Edmans, A., Gabaix, X., & Jenter, D. (2017b). Executive compensation: A Survey of Theory and Evidence. The Handbook of the Economics of Corporate Governance, 1, 383–539.

Eisenberg, T., Sundgren, S., & Wells, M. (1998). Larger Board Size and Decreasing Firm Value in Small Firms. Journal of Financial Economics, 48, 35–54. http://www.sciencedirect.com/science/article/pii/S0304405X98000038

El-Erian, M. A. (2016). The Only Game in Town: Central Banks, Instability, and Avoiding the Next Collapse. Random House.

Farre-Mensa, J., Ljungqvist, A., & Schroth, E. (2022). How Prevalent Are Financial Constraints in the U.S.? Working Paper.

Ferreira, D., Ferreira, M. A., & Raposo, C. C. (2011). Board Structure and Price Informativeness. Journal of Financial Economics, 99(3), 523–545.

Gai, P., & Tong, E. (2022). Information Spillovers of US Monetary Policy. Journal of Macroeconomics, 72, 103401.

Galí, J., & Gambetti, L. (2015). The Effects of Monetary Policy on Stock Market Bubbles: Some Evidence. American Economics Journal: Macroeconomics, 7(1), 233–257.

Gambacorta, L., Hofmann, B., & Peersman, G. (2014). Monetary Policy at the Zero Lower Bound: A Cross-Country Analysis. Journal of Money, Credit and Banking, 46(4), 615–642.

Gertler, M., & Karadi, P. (2015). Monetary Policy Surprises, Credit Costs, and Economic Activity. American Economic Journal: Macroeconomics, 7(1), 44–76.

Gormley, Todd. A., & Matsa, D. A. (2016). Playing It Safe? Managerial Preferences, Risk, and Agency Conflicts. Journal of Financial Economics, 122, 431–455.

Guay, W. R. (1999). The Sensitivity of CEO Wealth to Equity Risk: An Analysis of the Magnitude and Determinants. Journal of Financial Economics, 53(1), 43–71.

Gulen, H., & Ion, M. (2016). Policy Uncertainty and Corporate Investment. Review of Financial Studies, 29(3), 523–564.

Hayes, R. M., Lemmon, M., & Qiu, M. (2012). Stock Options and Managerial Incentives for Risk Taking: Evidence from FAS 123R. Journal of Financial Economics, 105(1), 174–190.

Iacoviello, M., & Minetti, R. (2008). The Credit Channel of Monetary Policy: Evidence from the Housing Market. Journal of Macroeconomics, 30(1), 69–96.

Jacobs, L., & King, D. (2016). Fed Power: How Finance Wins. Oxford University Press.

Jansen, D. W., & Zervou, A. (2017). The Time Varying Effect of Monetary Policy on Stock Returns. Economics Letters, 160, 54–58.

Jarociński, M., & Karadi, P. (2020). Deconstructing Monetary Policy Surprises—The Role of Information Shocks. American Economic Journal: Macroeconomics, 12(2), 1–43.

Jeenas, P. (2019). Firm Balance Sheet Liquidity, Monetary Policy Shocks, and Investment Dynamics. Working Paper.

Jensen, M. C., & Meckling, W. H. (1976). Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure. Journal of Financial Economics, 3(4), 305–360.

Jiménez, G., Ongena, S., Peydró, J.-L., & Saurina, J. (2012). Credit Supply and Monetary Policy: Identifying the Bank Balance-Sheet Channel with Loan Applications. The American Economic Review, 102(5), 2301–2326.

Jordà, Ò. (2005). Estimation and Inference of Impulse Responses by Local Projections. American Economic Review, 95(1), 161–182.

Jordà, Ò., Schularick, M., & Taylor, A. M. (2020). The Effects of Quasi-Random Monetary Experiments. Journal of Monetary Economics, 112, 22–40.

Jurado, K., Ludvigson, S. C., & Ng, S. (2015). Measuring Uncertainty. American Economic Review, 103(5), 1177–1216.

Kahneman, D., Slovic, P., & Tversky, A. (1982). Judgment under Uncertainty: Heuristics and Biases. Cambridge University Press.

Keynes, J. M. (1921). A Treatise on Probability. MacMillan & Co.

Knight, F. H. (1921). Risk, Uncertainty and Profit. Houghton Mifflin Company.

Knopf, J. D., Nam, J., & Thornton, J. H. (2002). The Volatility and Price Sensitivities of Managerial Stock option Portfolios and Corporate Hedging. Journal of Finance, 57(2), 801–813.

Kong, D., Pan, Y., Tian, G. G., & Zhang, P. (2020). CEOs' Hometown Connections and Access to Trade Credit: Evidence from China. Journal of Corporate Finance, 62, 101574.

Kubick, T. R., Robinson, J. R., & Starks, L. T. (2017). CEO Incentives for Risk-Taking and Compensation Duration. The Accounting Review, 1–24.

Kurov, A. (2010). Investor Sentiment and the Stock Market's Reaction to Monetary Policy. Journal of Banking & Finance, 31(4), 139–149.

Liu, Y., & Mauer, D. C. (2011). Corporate Cash Holdings and CEO Compensation Incentives. Journal of Financial Economics, 102, 183–198.

Lo, A. W. (2017). Adaptive Markets: Financial Evolution at the Speed of Thought. Princeton University Press.

Mazur, M., & Salganik-Shoshan, G. (2019). The Effect of Executive Stock Option Delta and Vega on the Spin-Off Decision. The Quarterly Review of Economics and Finance, 72(132–144).

Merton, R. C. (1973). Theory of Rational Option Pricing. The Bell Journal of Economics and Management Science, 141–183.

Nakamura, E., & Steinsson, J. (2018). High-Frequency Identification of Monetary Non-Neutrality: the Information Effect. The Quarterly Journal of Economics, 133(3), 1283–1330.

Ottonello, P., & Winberry, T. (2020). Financial Heterogeneity and the Investment Channel of Monetary Policy. Econometrica, 88(6), 2473–2502.

Pascal, P. (2019). The Time-Varying Effect of Monetary Policy on Asset Prices. Review of Economics and Statistics, 1–44.

Peersman, G., & Smets, F. (2005). The Industry Effects of Monetary Policy in the Euro Area. The Economic Journal, 115(503), 319–342. https://doi.org/10.1111/j.1468-0297.2005.00991.x

Peters, R. H., & Taylor, L. A. (2017). Intangible Capital and the Investment-Q Relation. Journal of Financial Economics, 123(2), 251–272.

Powell, J. (2023, June 29). Financial Stability and Economic Developments. Speech at the Banco de Espana Fourth Conference on Financial Stability, Madrid, Spain.

Ross, S. A. (2004). Compensation, Incentives, and the Duality of Risk Aversion and Riskiness. The Journal of Finance, 59(1), 207–225.

Rost, K., & Osterloh, M. (2010). Opening the Black Box of Upper Echelons: Drivers of Poor Information Processing During the Financial Crisis. Corporate Governance: An International Review, 18(3), 212–233.

Russo, A., & Perrini, F. (2010). Investigating stakeholder theory and social capital: CSR in large firms and SMEs. Journal of Business Ethics, 91(2), 207–221.

Sauerwald, S., & Su, W. (2019). CEO Overconfidence and CSR Decoupling. Corporate Governance: An International Review, 27(4), 283–300.

Shackle, G. L. S. (1961). Decision Order and Time in Human Affairs. Cambridge University Press.

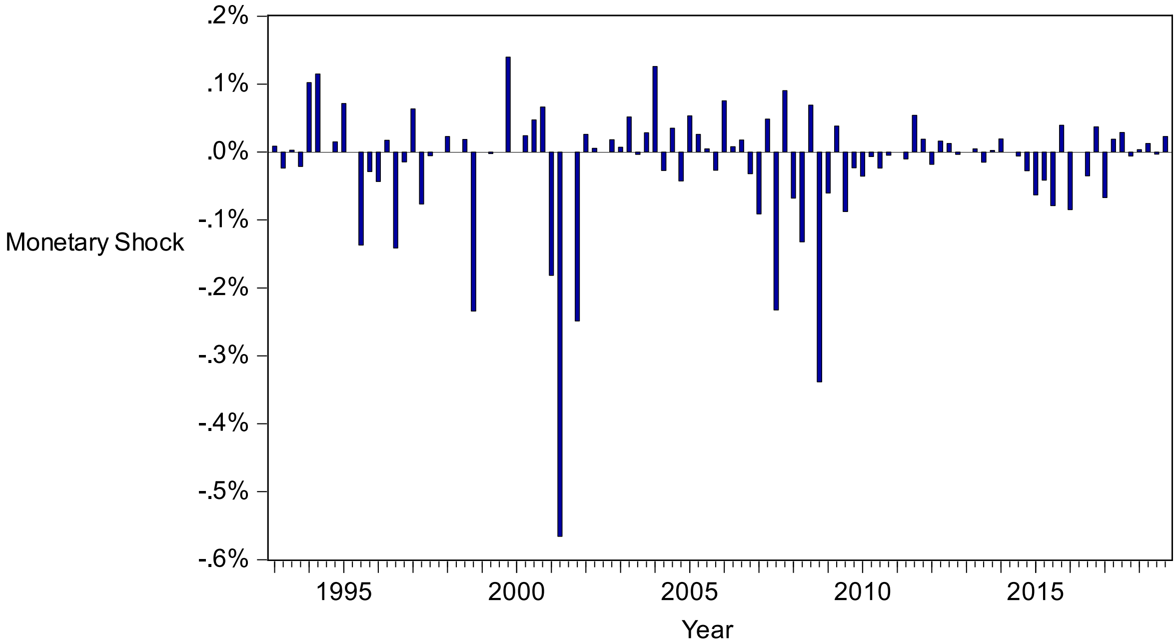
Shackle, G. L. S. (1992). Epistemics and Economics: A Critique of Economic Doctrines. Routledge.

Smith, C. W., & Stulz, R. M. (1985). The Determinants of Firms' Hedging Policies. Journal of Financial and Quantitative Analysis, 20(4), 391–405.

Thorbecke, W. (1997). On Stock Market Returns and Monetary Policy. The Journal of Finance, 52(2), 635–654. https://doi.org/10.1111/j.1540-6261.1997.tb04816.x

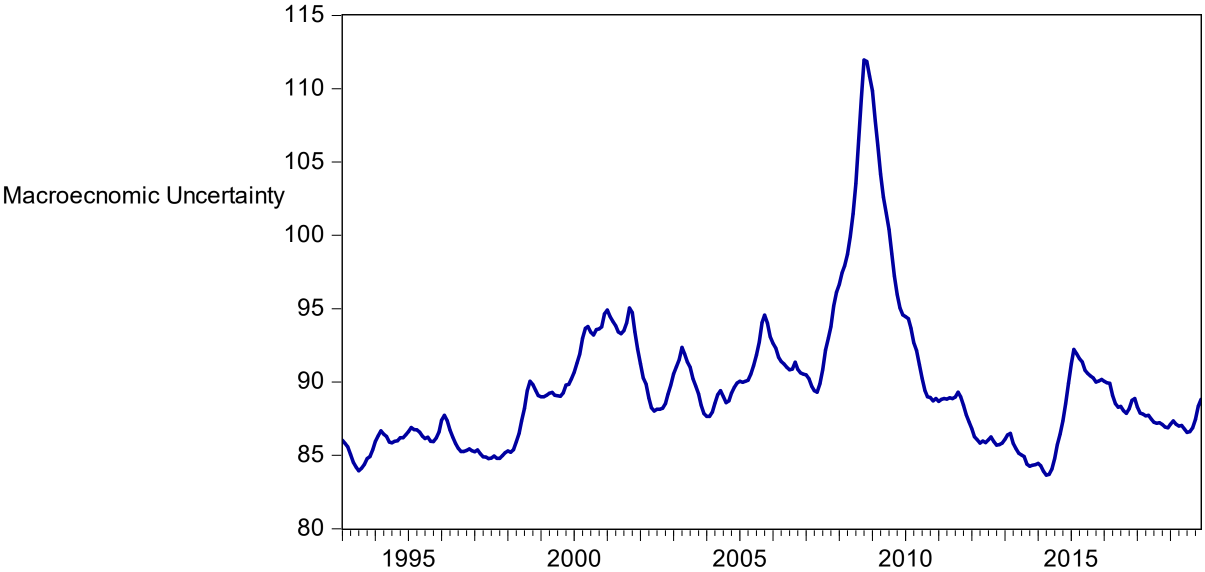
Yellen, J. L. (2016, August 26). The Federal Reserve’s Monetary Policy Toolkit: Past, Present, and Future. Speech at “Designing Resilient Monetary Policy Frameworks for the Future,” a Symposium Sponsored by the Federal Reserve Bank of Kansas City, Jackson Hole, Wyoming.

Figure 1: Quarterly monetary shocks



Note: This figure presents the quarterly levels of the conventional monetary shock series estimated by Jarociński and Karadi (2020) from the first quarter of 1993 until the fourth quarter of 2018.

Figure 2: Time variation in macroeconomic uncertainty



Note: This figure visualizes the monthly levels of the 12-montn-ahead Jurado et al. (2015) macroeconomic uncertainty index between 1993 and 2018.

Table 1: Descriptive statistics

Variable	# of Obs.	Mean	25th Pct	Median	75th Pct	SD
CEOVega	75,352	130.26	10.66	42.29	129.25	289.63
CEODelta	75,352	1,061.64	77.40	205.62	569.75	9,924.36
CAPX	75,352	111.34	5.27	17.20	61.92	399.67
CAPX/Assets	75,352	0.02	0.01	0.011	0.02	0.02
CAPX/PPENTQ	75,352	0.06	0.03	0.05	0.08	0.06
Intangibles/Assets	75,352	0.03	0.01	0.02	0.04	0.03
Intangibles	75,352	110.49	6.53	19.39	62.34	417.75
CEOWealth	75,352	97,232.72	6,069.13	16,117.92	44,891.67	988.649.70
PPETNQ	75,352	2,286.48	85.85	313.04	1,163.09	8,429.04
Assets	75,352	7,078.70	477.32	1,344.48	4,373.32	27,010.82
RoA	75,352	0.95	0.38	1.39	2.49	5.43
SalesGrowth	75,352	31.67	1.24	39.40	64.06	98.51
Div	75,352	0.56	0.00	1.00	1.00	0.49
CashFlow	75,352	6.18	1.67	5.44	10.45	9.58
Debt	75,352	53.24	37.25	52.80	65.99	25.98
MonShock	75,352	0.08	-0.05	0.16	0.59	1.03
Uncertainty	75,352	88.44	86.41	88.95	91.19	12.06
LeadingIndex	75,352	1.30	1.10	1.52	1.73	0.80
Unemployment	75,352	5.76	4.60	5.40	6.50	1.65
CPI	75,352	198.34	166.00	198.80	231.02	33.18
StockMarket	75,352	2.31	-0.53	3.25	6.69	8.28
HighCSR	56,194	0.59	0.00	1.00	1.00	0.49
LargeBoard	57,432	0.00	1.00	1.00	1.00	0.49
TakeoverIndex	55,117	0.19	0.11	0.16	0.26	0.10

Note: This table presents key descriptive statistics of the variables used in this study. For each variable, the available number of observations, mean, median, 25th, and 75th percentiles, in addition to the standard deviation, are reported.

Table 2: Executive compensation and the local projection effects of monetary shocks on capital investment

Explanatory Variables \ Horizon	$h=1$	$h=2$	$h=3$	$h=4$	$h=5$	$h=6$	$h=7$	$h=8$	Aggregate Effect
$MonShock_t$	-0.069	-0.298**	-0.325**	-0.200	-0.363*	-0.284	-0.284	-0.256	-1.754*
	(0.142)	(0.142)	(0.165)	(0.193)	(0.212)	(0.230)	(0.254)	(0.230)	(0.938)
$MonShock_t \times \ln(CEOVega_{i,t})$	-0.048***	-0.044***	-0.031**	0.002	0.012	0.000	-0.046	-0.057***	-0.358***
	(0.009)	(0.01)	(0.015)	(0.033)	(0.037)	(0.043)	(0.048)	(0.024)	(0.168)
$MonShock_t \times \ln(CEODelta_{i,t})$	0.045	0.102***	0.095***	0.056	0.067	0.055	0.095*	0.062	0.570***
	(0.029)	(0.029)	(0.033)	(0.039)	(0.043)	(0.047)	(0.052)	(0.047)	(0.192)
$\ln(CEOVega_{i,t})$	-0.121***	-0.127***	-0.141***	-0.155***	-0.161***	-0.133***	-0.097*	-0.079	-1.027***
	(0.029)	(0.029)	(0.034)	(0.040)	(0.045)	(0.050)	(0.056)	(0.053)	(0.215)
$\ln(CEODelta_{i,t})$	0.372	0.437	0.755*	0.643	0.823	1.100**	0.878	1.138**	6.380***
	(0.345)	(0.345)	(0.403)	(0.472)	(0.524)	(0.572)	(0.633)	(0.576)	(2.359)
$FinConst_{i,t-1}$	2.025***	2.461***	2.808***	3.044***	3.218***	3.671***	3.795***	3.025***	22.809***
	(0.221)	(0.220)	(0.257)	(0.302)	(0.337)	(0.371)	(0.411)	(0.376)	(1.544)
$\ln(CEOWealth_{i,t-1})$	0.694**	0.680**	0.441	0.583	0.469	0.130	0.299	-0.001	2.610
	(0.321)	(0.320)	(0.374)	(0.438)	(0.486)	(0.531)	(0.587)	(0.534)	(2.186)
$\ln(Assets_{i,t-1})$	-1.542***	-2.151***	-2.771***	-3.354***	-4.272***	-5.029***	-5.641***	-5.966***	-33.686***
	(0.090)	(0.089)	(0.103)	(0.122)	(0.141)	(0.159)	(0.175)	(0.162)	(0.676)
$CashFlow_{i,t-1}$	-0.001***	0.001***	0.001***	0.001***	0.001***	-0.000	-0.000	-0.001*	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$SalesGrowth_{i,t-1}$	0.002***	-0.002***	0.004***	0.004***	0.005***	-0.002***	0.002***	-0.000	0.004
	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)
$RoA_{i,t-1}$	0.122***	0.120***	0.128***	0.107***	0.113***	0.150***	0.155***	0.140***	0.999***
	(0.008)	(0.008)	(0.010)	(0.011)	(0.012)	(0.014)	(0.015)	(0.014)	(0.057)
$\ln(CPI_{i,t-1})$	-0.312	1.103***	2.571***	4.248***	6.303***	7.591***	8.511***	9.309***	43.348***
	(0.442)	(0.440)	(0.517)	(0.612)	(0.695)	(0.776)	(0.864)	(0.798)	(3.292)
$Unemployment_{t-1}$	-0.092***	-0.067**	-0.110***	-0.073*	-0.097**	-0.065	-0.077	-0.011	-0.494**
	(0.029)	(0.029)	(0.034)	(0.040)	(0.045)	(0.049)	(0.054)	(0.050)	(0.204)
$LeadingIndex_{,t-1}$	0.246***	0.316***	0.193***	0.324***	0.180**	0.290***	0.152	0.279***	1.919***
	(0.058)	(0.058)	(0.067)	(0.078)	(0.085)	(0.092)	(0.101)	(0.091)	(0.373)
$StockMarket_{t-1}$	0.005	-0.001	0.031***	-0.002	0.028***	0.010	0.028***	-0.004	0.074**
	(0.005)	(0.005)	(0.006)	(0.007)	(0.008)	(0.009)	(0.009)	(0.009)	(0.035)
Sector-Time Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES
Firm Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES
N	69550	68014	66162	64331	62524	60742	58991	57299	57299
Adjusted R-Squared	0.09	0.09	0.10	0.11	0.11	0.06	0.06	0.06	0.06

Note: This table tracks the evolution of the monetary shock's impact on the firm's capital investment over an eight-quarter horizon, with emphasis on the role of CEO compensation structure. Columns 1 to 5 present estimations of Equation (1) for h levels ranging from $h = 1$ to $h = 8$, inclusive. Column 6 represents estimation of the aggregated effects from $h = 1$ to $h = 8$, inclusive. Two-way clustered standard errors are reported within the parentheses. Our results remain robust when considering alternatives by firm, sector, and sector-year. All variables are defined in Appendix A. ***, **, and * represent significant at the 1%, 5%, and 10% level, respectively.

Table 3: The effects of monetary shocks on capital investment with emphasis on the role of leverage and uncertainty

Explanatory Variables \ Horizon	$h = 1$	$h = 2$	$h = 3$	$h = 6$	$h = 8$	Aggregate Effect
$MonShock_t$	-0.024	-0.400*	0.019	-0.260	-0.208	-1.942
	(0.211)	(0.210)	(0.245)	(0.345)	(0.347)	(1.419)
$MonShock_t \times \ln(Vega_{i,t})$	-0.151***	-0.145***	-0.096*	-0.050	-0.345***	-1.420***
	(0.045)	(0.045)	(0.052)	(0.073)	(0.074)	(0.303)
$MonShock_t \times \ln(Vega_{i,t}) \times FinConst_{i,t-1}$	0.142**	0.162**	0.158**	0.239***	0.299**	1.188**
	(0.071)	(0.071)	(0.074)	(0.092)	(0.133)	(0.545)
$MonShock_t \times \ln(Vega_{i,t}) \times HighUncertainty_{t-1}$	0.135***	0.113**	0.190***	0.036	0.327***	0.811***
	(0.049)	(0.049)	(0.057)	(0.082)	(0.083)	(0.339)
$MonShock_t \times \ln(Delta_{i,t})$	0.037	0.094***	0.085***	0.054	0.055	0.514***
	(0.029)	(0.029)	(0.033)	(0.048)	(0.048)	(0.194)
$MonShock_t \times FinConst_{i,t-1}$	-0.180	0.463	-0.247	-0.767	-0.765	-1.643
	(0.316)	(0.315)	(0.368)	(0.514)	(0.522)	(2.132)
$MonShock_t \times HighUncertainty_{t-1}$	-0.029	0.082	-0.457*	0.088	0.095	0.597
	(0.205)	(0.204)	(0.238)	(0.342)	(0.346)	(1.414)
$\ln(CEOVega_{i,t}) \times FinConst_{i,t-1}$	0.513***	0.549***	0.646***	0.577***	0.799***	3.655***
	(0.128)	(0.127)	(0.148)	(0.211)	(0.213)	(0.872)
$\ln(CEOVega_{i,t}) \times HighUncertainty_{t-1}$	-0.029	0.082	-0.457*	0.088	0.095	0.597
	(0.205)	(0.204)	(0.238)	(0.342)	(0.346)	(1.414)
$\ln(CEOVega_{i,t})$	-0.114***	-0.133***	-0.150***	-0.112**	-0.036	-0.947***
	(0.033)	(0.034)	(0.039)	(0.057)	(0.061)	(0.251)
$\ln\ (CEODelta_{i,t})$	0.410	0.494	0.844**	1.209**	1.281**	7.018***
	(0.346)	(0.345)	(0.403)	(0.573)	(0.577)	(2.363)
$FinConst_{i,t-1}$	0.207	0.516	0.513	1.608**	0.189	9.858***
	(0.504)	(0.503)	(0.585)	(0.836)	(0.843)	(3.459)
$HighUncertainty_{i,t-1}$	0.656**	0.628**	0.358	0.037	-0.116	2.069
	(0.321)	(0.321)	(0.374)	(0.532)	(0.535)	(2.190)
$\ln(ManagerialWealth_{i,t-1})$	-1.565***	-2.177***	-2.796***	-5.056***	-6.009***	-33.865***
	(0.090)	(0.089)	(0.104)	(0.159)	(0.162)	(0.678)
$\ln(Assets_{i,t-1})$	-0.000***	0.000***	0.000***	-0.000	-0.000*	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$CashFlow_{i,t-1}$	0.002***	-0.002***	0.004***	-0.002***	-0.000	0.004
	(0.000)	(0.000)	(0.000)	(0.001)	(0.001)	(0.002)
$SalesGrowth_{i,t-1}$	0.121***	0.119***	0.127***	0.151***	0.139***	0.996***
	(0.008)	(0.008)	(0.010)	(0.014)	(0.014)	(0.057)
$RoA_{i,t-1}$	-0.231	1.184***	2.537***	7.789***	9.713***	44.690***
	(0.444)	(0.442)	(0.519)	(0.780)	(0.804)	(3.314)
$\ln(CPI_{i,t-1})$	-0.075***	-0.073**	-0.123***	-0.108**	-0.054	-0.672***
	(0.030)	(0.030)	(0.036)	(0.052)	(0.053)	(0.217)
$Unemployment_{t-1}$	0.298***	0.278***	0.153**	0.141	0.098	1.274***
	(0.066)	(0.066)	(0.077)	(0.106)	(0.105)	(0.431)
$LeadingIndex_{,t-1}$	0.006	-0.001	0.029***	0.011	-0.002	0.079**
	(0.005)	(0.005)	(0.006)	(0.009)	(0.009)	(0.035)
$StockMarket_{t-1}$	-0.114***	-0.133***	-0.150***	-0.112**	-0.036	-0.947***
	(0.033)	(0.034)	(0.039)	(0.057)	(0.061)	(0.251)
Sector-Time Effects	YES	YES	YES	YES	YES	YES
Firm Effects	YES	YES	YES	YES	YES	YES
N	69550	68014	66162	60742	57299	57299
Adjusted R-Squared	0.10	0.10	0.11	0.11	0.13	0.13

Note: This table tracks the evolution of the monetary shock's impact on the firm's capital investment over an eight-quarter horizon. These models emphasize influence of the CEO compensation structure on this investment reaction while depicting how Vega's role in this reaction is shaped by financial constraints and economic uncertainty. Columns 1 to 5 present estimations of Equation (2) for $h = 1$, $h = 2$, $h = 3$, $h = 6$, and $h = 8$, respectively. Column 6 represents estimation of the aggregated effects from $h = 1$ to $h = 8$, inclusive. Two-way clustered standard errors are reported within the parentheses. Our results remain robust when considering alternatives by firm, sector, and sector-year. All variables are defined in Appendix A. ***, **, and * represent significant at the 1%, 5%, and 10% level, respectively.

Table 4: The effects of monetary shocks on capital investment with emphasis on the role of leverage, uncertainty, and Delta levels

Explanatory Variables \ Horizon	$h = 1$	$h = 2$	$h = 3$	$h = 6$	$h = 8$	Aggregate Effect
$MonShock_t$	-0.024	-0.400**	0.019	-0.260	-0.208	-1.942*
	(0.211)	(0.210)	(0.245)	(0.345)	(0.347)	(1.119)
$MonShock_t \times \ln(CEOVega_{i,t})$	-0.152***	-0.115***	-0.185***	-0.009	-0.241***	-0.961***
	(0.040)	(0.041)	(0.047)	(0.060)	(0.074)	(0.287)
$MonShock_t \times \ln(CEOVega_{i,t}) \times FinConst_{i,t-1}$	0.045**	0.167***	0.102	0.412***	0.416***	1.927***
	(0.021)	(0.057)	(0.078)	(0.114)	(0.129)	(0.477)
$MonShock_t \times \ln(CEOVega_{i,t}) \times HighUncertainty_{t-1}$	0.085***	0.013	0.057***	0.005	0.275***	0.601***
	(0.033)	(0.042)	(0.020)	(0.069)	(0.081)	(0.177)
$MonShock_t \times \ln(CEODelta_{i,t})$	0.123***	0.097***	0.122***	0.004	-0.009	0.777***
	(0.037)	(0.037)	(0.041)	(0.062)	(0.070)	(0.258)
Control Factors	YES	YES	YES	YES	YES	YES
Sector-Time Effects	YES	YES	YES	YES	YES	YES
Firm Effects	YES	YES	YES	YES	YES	YES
N	69550	68014	66162	60742	57299	57299
Adjusted R-Squared	0.10	0.10	0.11	0.11	0.13	0.13

Note: This table tracks the evolution of the monetary shock's impact on the firm's capital investment over an eight-quarter horizon. These models emphasize influence of the CEO compensation structure on this investment reaction while depicting how Vega's role in this reaction is shaped by financial constraints, economic uncertainty, and the level of Delta. Columns 1 to 5 present estimations of Equation (3) for $h = 1$, $h = 2$, $h = 3$, $h = 6$, and $h = 8$, respectively. Column 6 represents estimation of the aggregated effects from $h = 1$ to $h = 8$, inclusive. Two-way clustered standard errors are reported within the parentheses. Our results remain robust when considering alternatives by firm, sector, and sector-year. All variables are defined in Appendix A. ***, **, and * represent significant at the 1%, 5%, and 10% level, respectively.

Table 5: The effects of monetary shocks on capital investment with emphasis on the role of CEO compensation Deltas and Vegas

Explanatory Variables \ Horizon	$h = 1$	$h = 2$	$h = 3$	$h = 6$	$h = 8$	Aggregate Effect
$MonShock_t$	-0.194	-0.358	0.004	-0.581	-0.411	-3.204
	(0.300)	(0.299)	(0.350)	(0.493)	(0.503)	(2.053)
$MonShock_t \times \ln(CEOVega_{i,t})$	-0.002	-0.057	-0.091	0.044	-0.086	-0.050
	(0.076)	(0.076)	(0.089)	(0.127)	(0.130)	(0.532)
$MonShock_t \times \ln(Vega_{i,t}) \times \ln(Delta_{i,t})$	-0.029***	0.022**	-0.001	-0.017	-0.050***	-0.064***
	(0.011)	(0.011)	(0.013)	(0.018)	(0.019)	(0.026)
$MonShock_t \times \ln(CEOVega_{i,t}) \times FinConst_{i,t-1}$	0.128***	0.005	0.158**	0.247**	0.303***	1.217**
	(0.042)	(0.081)	(0.075)	(0.102)	(0.114)	(0.546)
$MonShock_t \times \ln(CEOVega_{i,t}) \times HighUncertainty_{t-1}$	0.060**	0.02	0.081**	0.038	0.126***	0.815***
	(0.029)	(0.029)	(0.037)	(0.042)	(0.043)	(0.339)
$MonShock_t \times \ln(CEODelta_{i,t})$	0.010**	0.085*	0.087	0.114	0.092	0.746**
	(0.050)	(0.050)	(0.058)	(0.081)	(0.082)	(0.335)
Control Factors	YES	YES	YES	YES	YES	YES
Sector-Time Effects	YES	YES	YES	YES	YES	YES
Firm Effects	YES	YES	YES	YES	YES	YES
N	69550	68014	66162	60742	57299	57299
Adjusted R-Squared	0.11	0.11	0.12	0.12	0.14	0.14

Note: This table tracks the evolution of the monetary shock's impact on the firm's capital investment over an eight-quarter horizon. These models emphasize influence of the CEO's compensation structure on this investment reaction while depicting how Vega's role in this reaction is shaped by financial constraints, economic uncertainty, and the level of Delta. In Panel A, Columns 1 to 5 present estimations for a modified version of Equation (2) where the Deltas and Vegas are replaced by the CEO Deltas and Vegas. We provide results for $h = 1$, $h = 2$, $h = 3$, $h = 6$, and $h = 8$, respectively. Column 6 represents estimation of the aggregated effects from $h = 1$ to $h = 8$, inclusive. Two-way clustered standard errors are reported within the parentheses. Our results remain robust when considering alternatives by firm, sector, and sector-year. All variables are defined in Appendix A. ***, **, and * represent significant at the 1%, 5%, and 10% level, respectively.