



School of Economics and Management

Earnings Surprises and Stock Market Reactions: A
Comprehensive Empirical Investigation into the
Moderating Effects of Financial, Policy, and Investor
Sentiment Uncertainty

Master Thesis Finance

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Abstract

This study examines how investors react to quarterly earnings and revenue surprises in large U.S. firms and how these reactions depend on financial, policy and behavioral uncertainty. The analysis uses a sample of about 43,000 earnings announcements by S&P 500 constituents between 2003 and 2025. Market reactions are measured with a standard market-model event-study design, and cross-sectional regressions link cumulative abnormal returns to standardized earnings and revenue surprises, implied volatility (VIX), U.S. economic policy uncertainty (EPU) and Baker–Wurgler investor sentiment. The results show that both earnings and revenue surprises are strongly priced in short announcement windows, with earnings news having the larger impact. Joint moderation tests indicate that investor sentiment and policy uncertainty mainly affect the sensitivity of returns to earnings surprises: high sentiment weakens, and high policy uncertainty dampens, the earnings–return relation, while revenue effects are smaller and less precisely estimated and financial volatility has no robust moderating role. Post-announcement windows up to 60 trading days reveal reversal rather than drift, especially for revenue news, and this pattern is only weakly shaped by uncertainty.

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1. Introduction

Financial markets revolve around information, and quarterly earnings announcements are among the clearest and most concrete signals that investors receive. Reported earnings and revenues are grounded in audited accounts and formal disclosure rules, which makes them very different from narratives, headlines or general market sentiment. At the same time, prices are not driven by fundamentals alone. They also reflect how investors feel about risk, the macroeconomic environment and the political climate. Volatility, policy uncertainty and shifts in investor sentiment capture this more subjective side of the market. Together, hard accounting information and these broader sources of uncertainty jointly shape how firms are valued.

The interaction between these two dimensions is still not well understood. A large body of research studies how markets react to earnings surprises and, to a lesser extent, to revenue surprises. A separate strand shows that uncertainty in financial markets, in economic policy and in investor mood affects asset prices more generally. Yet the joint effect of quarterly results and different forms of uncertainty on announcement returns has received limited attention. Existing work often focuses on a single uncertainty channel or abstracts from firm level news altogether. As a result, there is relatively little evidence on how the same earnings news is priced when markets are calm compared to when volatility is elevated, policy is unpredictable or sentiment is depressed.

This question is particularly relevant in the period from 2003 to 2025. Investors in this era have access to richer and faster information than in earlier decades, and trading technology allows prices to adjust almost immediately after news arrives. Over the same period, markets experienced several major episodes of stress, including the global financial crisis, the euro area sovereign debt crisis, the Covid-19 pandemic and repeated spikes in macroeconomic and political uncertainty. This environment provides a natural setting to examine whether and how different forms of uncertainty shape the way quarterly earnings and revenue surprises are incorporated into stock prices, and to test the idea that uncertainty plays a meaningful role in the market response to firm level announcements.

The central objective is to examine how quarterly earnings and revenue surprises are reflected in stock prices under different states of market uncertainty. The analysis focuses on whether firm specific news about profitability and revenue is associated with abnormal returns around earnings announcements and on how this relation is influenced by financial, macroeconomic and behavioral uncertainty. The main research question is to what extent different forms of uncertainty shape stock market reactions to quarterly results for large United States firms.

To address this question, the study first establishes the baseline link between earnings and revenue surprises and abnormal announcement returns. Earnings per share and revenue surprises are constructed using analyst expectations from FactSet and related to short window cumulative abnormal returns within a unified framework. This allows a direct comparison of the information content of earnings and revenue while holding the empirical design constant across specifications.

The core of the analysis then evaluates how financial, policy and behavioral conditions shape the earnings–return and revenue–return relations. Two standard uncertainty channels are considered: financial uncertainty, captured by the VIX, and macroeconomic and policy uncertainty, measured by the Economic Policy Uncertainty index. In addition, a behavioral channel is represented by the Baker and Wurgler investor sentiment index. Although this index is not an uncertainty measure in a strict sense, in this study it is treated as a behavioral dimension of uncertainty because shifts in sentiment change how confident investors are in their valuations and how they react to quarterly news. Each measure is matched to the announcement date and all three are entered jointly in the regression framework, with their levels and interactions with earnings and revenue surprises estimated simultaneously. This makes it possible to compare how these dimensions, conditional on one another, alter the sensitivity of announcement returns to firm-level news. As an additional analysis, the study also explores whether part of the price adjustment occurs after the announcement and whether this post-announcement behavior differs across uncertainty states, complementing the focus on short-window reactions.

All firm specific information is obtained from FactSet. The dataset combines detailed quarterly earnings data from FactSet Estimates and Actuals with daily stock prices from FactSet Prices. For each firm and fiscal quarter, it contains actual and expected values for

earnings per share and revenue, together with measures of analyst consensus and forecast errors. These observations are linked to the official earnings release date and merged with the corresponding daily return series, which provides a suitable setting for an event study of stock price reactions to quarterly news.

To characterize the environment in which these announcements take place, the firm level data are complemented with three standard proxies for financial, macroeconomic policy and behavioral uncertainty. These measures are matched to the timing of each event and incorporated into the empirical design as conditioning variables and interaction terms. The combined structure of earnings, return and uncertainty data makes it possible to study how announcement returns depend on both firm specific news and the broader state of the market. The empirical results show that quarterly earnings announcements generate strong and systematic stock price reactions. Both earnings and revenue surprises are positively and significantly related to abnormal returns across all short event windows, consistent with the idea that markets respond in a clear way to firm specific news. Earnings surprises carry more weight than revenue surprises, which supports the view that investors treat earnings per share as the primary performance signal while still assigning a meaningful, but smaller, role to revenue information.

The effect of uncertainty is more nuanced. Investor sentiment and financial uncertainty show at best mixed evidence of conditioning announcement returns. Higher investor sentiment is associated with a weaker reaction to earnings news in some specifications, while the sensitivity to revenue remains broadly unchanged, which offers only limited support for the notion that optimistic markets systematically amplify firm-level announcements. The VIX displays small and specification-dependent interaction effects: when it is included alongside the other uncertainty measures, some coefficients become significant, but the overall earnings and revenue responses in short windows are not materially altered, suggesting that implied volatility plays a secondary role in the immediate pricing of quarterly surprises. In contrast, economic policy uncertainty does change how news is incorporated. When the EPU index is high, the response to earnings surprises becomes weaker and the response to revenue surprises becomes stronger, suggesting that investors shift part of their attention from accrual-based earnings measures towards revenue when the policy environment is more uncertain.

There is no evidence of positive post announcement drift. In the weeks and months after the announcement, abnormal returns linked to both earnings and revenue surprises tend to reverse rather than continue in the direction of the initial news, with the reversal particularly pronounced for revenue surprises. Interactions between post announcement returns and the uncertainty measures are generally small and statistically insignificant, apart from a modest and temporary effect for revenue under high volatility. Overall, the findings indicate that the main impact of uncertainty occurs in the immediate reaction to quarterly results, and that policy uncertainty can shift the relative importance of earnings and revenue in the price formation process, while longer horizon adjustments do not display the delayed incorporation of information that is often associated with post earnings announcement drift.

Existing research shows that uncertainty affects how markets process earnings information: volatility is linked to noisier and less efficient post-announcement returns, policy uncertainty to weaker market quality and smaller short-window reactions, and sentiment to follow-up return behavior. The evidence is fragmented, however. Most studies analyze a single uncertainty dimension or focus on post-earnings-announcement drift rather than on the contemporaneous announcement reaction, and work on earnings versus revenue is rarely combined with explicit uncertainty measures.

This study contributes by modelling earnings and revenue surprises jointly in a modern event-study framework for a large panel of S&P 500 firms over 2003–2025 and by estimating a unified specification in which three standard proxies for financial, policy and behavioral uncertainty enter together and are each interacted with the news variables. Applying a common design to the VIX, the Economic Policy Uncertainty index and Baker–Wurgler sentiment allows a direct comparison of how these dimensions condition announcement-period returns and subsequent adjustment and offers a more general view of how contemporary uncertainty regimes shape stock market reactions to quarterly results.

The remainder of this thesis is structured as follows. Chapter 2 reviews the theoretical and empirical literature on earnings announcements, market efficiency and the roles of financial, policy and behavioral uncertainty. Chapter 3 describes the data sources, sample selection and construction of the main variables, including earnings and revenue surprises, abnormal returns and the uncertainty measures. Chapter 4 develops the hypotheses on the baseline earnings–return relation, the relative role of earnings versus revenue, and the moderating

effects of sentiment, financial volatility and economic policy uncertainty. Chapter 5 sets out the empirical design, covering the event-study framework, return measurement and regression specifications. Chapter 6 presents the empirical results and robustness checks, and Chapter 7 concludes with a discussion of the main findings, limitations and implications for future research.

2. Literature review

This chapter reviews the key literature informing this study, which investigates how earnings and revenue surprises influence stock returns and how these effects vary under different conditions of market uncertainty.

2.1 Fundamentals of earnings announcements on market reaction

2.1.1 First academic literature

Earnings announcements are among the most studied events in capital market research. Early evidence established that accounting disclosures convey market-relevant information, as both stock prices and trading activity respond strongly to their release.

Ball and Brown (1968) were the first to demonstrate that unexpected earnings contain value-relevant information. Firms reporting results above expectations experience positive abnormal returns, while those with disappointing earnings show negative ones. They also observed that prices continue to adjust after the announcement, indicating that information is incorporated gradually rather than instantaneously—a finding that inspired subsequent research on market efficiency and anomalies.

Beaver (1968) complemented this evidence by showing that trading volume and return volatility increase sharply around earnings announcements. His results confirmed that these events are perceived by investors as significant information releases that trigger portfolio adjustments.

Collectively, these studies established earnings announcements as a cornerstone of empirical finance, proving that they carry information that directly shapes investor behavior and market prices. This foundation underpins later research on the strength and persistence of earnings-related price reactions.

2.1.2 Market Reactions and Anomalies: Post-Earnings-Announcement Drift

Subsequent research revealed that the market's reaction to earnings announcements is not always immediate or complete. The phenomenon known as *post-earnings-announcement drift (PEAD)* describes how stock prices continue to move in the direction of the earnings surprise for weeks or even months after the announcement.

Bernard and Thomas (1989) provide the most influential evidence of this anomaly. Firms with positive surprises show both an immediate increase and continued abnormal returns afterward, while negative surprises are followed by further declines. This behavior contradicts the Efficient Market Hypothesis, which implies that prices should fully and instantaneously incorporate new information. The persistence of returns therefore indicates gradual information adjustment, driven by investor underreaction or delayed incorporation of news.

Earlier studies also documented this pattern. Watts (1978) found abnormal returns following quarterly earnings that standard models such as the CAPM could not explain. Foster, Olsen, and Shevlin (1984) showed that the drift is stronger for large surprises and smaller firms, suggesting that the magnitude of the effect depends on context.

Overall, these findings demonstrate that earnings announcements represent extended information events rather than one-day reactions. This insight is central to the present study, as it implies that the strength and timing of market responses can vary with external conditions such as financial, macroeconomic, or political uncertainty.

2.1.3 Recent Insights and Modern Market Dynamics

While early studies established that earnings announcements contain value relevant information, more recent work shows that the structure of these announcements has changed in the modern period. Beaver, McNichols and Wang (2020) document that since roughly 2000 the market response to earnings releases has become much stronger. They attribute this to the fact that firms more often bundle several disclosures in one event. Earnings numbers are increasingly accompanied by management guidance, analyst updates and additional line items. Bundled announcements therefore concentrate information in a single moment and generate larger movements in both returns and trading volume than stand alone announcements. This confirms that earnings releases remain a focal point for information processing, but that the information load around these events has increased.

A second strand of research shows that the timing of these announcements is not neutral. DeHaan, Shevlin and Thornock (2015) find that managers take investor attention into account when they schedule earnings news. Unfavourable results are more often released after the close or on busy news days when attention is low, while good news is more likely to be disclosed when investors are paying attention. Their evidence implies that part of the observed return around earnings announcements reflects disclosure choices by managers. Attention frictions can therefore weaken or amplify the immediate price reaction even when the underlying information is comparable.

Finally, Savor and Wilson (2016) show that earnings announcements also have a systematic risk dimension. They find that firms' market betas rise around the announcement and that investors demand an announcement premium to compensate for the temporarily higher exposure to aggregate market risk. At the aggregate level, earnings events contribute to short lived increases in market variance. This broadens the interpretation of abnormal returns. Price changes around earnings releases do not only capture firm specific news, but also time varying risk that is priced by the market.

Taken together, these studies show that earnings announcements in the modern period are information dense, attention sensitive and temporarily riskier. This makes it likely that the strength of the return response depends on the broader environment in which the announcement takes place, which motivates the later analysis of uncertainty as a moderating factor.

2.2 Earnings versus Revenue Surprises

Although earnings surprises are one of the main indicators of firm performance, focusing solely on earnings provides an incomplete view of the information in quarterly results. Earnings figures combine multiple accounting components and can be influenced by accruals, estimates and cost allocations, which may obscure the true strength of a firm's operations. Revenue, by contrast, offers a more direct measure of market activity and contains information about growth prospects, demand conditions and future profitability. The distinction between earnings and revenue surprises is both accounting and economic. Investors may see revenue changes as early signals of shifts in product demand or competitive position, while earnings surprises often capture managerial efficiency or cost control. Understanding how markets react to both dimensions is essential for assessing how investors process financial disclosures and how different line items contribute to price formation.

The following sections discuss three influential studies that form the basis for analysing the relative informativeness of earnings and revenue surprises in this study.

2.2.1 Economic Foundation of Revenue Information

The study by Ertimur, Livnat, and Martikainen (2003) provides one of the earliest explanations for why revenue surprises contain distinct informational value relative to earnings. By decomposing earnings surprises into their two main components, namely unexpected changes in revenues and unexpected changes in expenses, they show that the market reacts more strongly to revenue surprises. A one dollar increase in revenue generates a larger positive stock return than an equivalent reduction in expenses, which suggests that investors perceive revenue changes as more persistent indicators of future performance, whereas expense adjustments are viewed as less sustainable.

The authors find that this asymmetry depends on firm characteristics. The sensitivity to revenue information is strongest among growth firms, where revenue growth signals expansion of market share and long-term value creation. In contrast, in mature or value firms, cost efficiency plays a relatively greater role in shaping investor reactions. The results further indicate that revenue surprises are particularly informative when operating costs are largely fixed, since increases in revenue translate more directly into higher future profitability. In addition, the study shows that investors use revenue information to assess the credibility of reported earnings. Positive earnings surprises that are not supported by matching revenue growth led to smaller market reactions, which implies that investors discount earnings perceived as the result of accounting adjustments rather than genuine operational improvement.

Taken together, these findings establish a clear economic foundation for including revenue surprises alongside earnings in market-based analyses. Revenues tend to be less affected by accounting discretion and offer an earlier and more direct signal of demand and performance, providing essential context for understanding how investors interpret financial results.

2.2.2 Incremental Informativeness of Revenue Alongside Earnings

Jegadeesh and Livnat (2006) examine whether revenue surprises provide additional information to investors beyond earnings surprises. Using quarterly data for a broad sample of U.S. firms, they measure earnings-per-share and revenue surprises relative to analyst forecasts and test their relationship with announcement-period returns. The results show that returns respond positively to both variables, yet the coefficient on earnings surprises is larger

and more significant. This indicates that the market reacts primarily to earnings news, while revenue contributes complementary information.

The authors also document that revenue information is incorporated into prices more slowly. Returns remain correlated with revenue surprises from the previous quarter, implying that investors underreact to revenue news at the time of its release. Analysts display a similar delay in forecast revisions, suggesting that the informational content of revenue is recognised with a lag compared with earnings.

Finally, the study finds that revenue surprises have some predictive power for future earnings changes and subsequent stock performance. This supports the view that revenue conveys forward-looking operational signals but remains secondary to earnings in terms of immediacy and market impact. Overall, the evidence shows that investors treat revenue as an additional, slower-processed source of information that helps to interpret earnings rather than replace them.

2.2.3 Contextual Variation in Revenue Relevance

Kama (2009) extends prior evidence on the information content of earnings and revenue surprises by showing that their relative importance depends on firm and industry characteristics. Using quarterly U.S. data for 1974 to 2005, he estimates announcement-period returns on standardized unexpected earnings (SUE) and standardized unexpected revenue (SURG) and interacts these measures with dummies for high R&D intensity, fourth-quarter reports and oligopolistic industries. He first finds that, for the full sample, the coefficient on earnings surprises is larger than the coefficient on revenue surprises, which is consistent with earlier studies.

When firms have high R&D expenditures, the reaction to earnings surprises becomes weaker while the reaction to revenue surprises becomes stronger. In these firms earnings are harder to interpret because of lower earnings precision, so investors rely more on revenue as an indicator of future performance.

A similar pattern appears in the fourth fiscal quarter. Kama reports that the earnings response coefficient declines in quarter four, most likely because year-end write-offs and discretionary accruals reduce the credibility of earnings, while the response to revenue does not fall by the same amount. This reduces the dominance of earnings in that reporting period.

Finally, in industries with higher concentration, where firms compete in a more oligopolistic setting, revenue surprises elicit a stronger market reaction. In such industries revenues are

more closely tied to market share and to the ability to influence future economic outcomes, so unexpected revenue growth is interpreted as a more strategic signal.

Overall, Kama concludes that the usual dominance of earnings over revenue diminishes in environments with low earnings precision, year-end reporting effects or oligopolistic competition. This supports the broader idea in this study that the market does not always weigh earnings and revenue surprises equally, and that external conditions can shift investor attention toward revenue.

2.3 Uncertainty

Uncertainty plays a fundamental role in financial markets because it affects how investors interpret information and price risk. When uncertainty in the market environment rises, investors become less confident in their assessments of firm value, leading to slower and often weaker reactions to new information. Earnings announcements, which are among the most closely followed corporate disclosures, are particularly sensitive to prevailing levels of uncertainty. In such periods, identical earnings or revenue surprises may trigger different market responses depending on the broader information environment.

This study considers two standard measures of uncertainty and one behavioral state variable that together capture key sources of variation in investor confidence and information precision. Financial uncertainty is measured by the VIX, policy uncertainty by the EPU index and investor sentiment is captured by the Baker and Wurgler sentiment index.

2.3.1 The role of market volatility

Financial market volatility provides a direct and forward-looking signal of how investors perceive risk. The CBOE Volatility Index (VIX), introduced by the Chicago Board Options Exchange and described by Whaley (2000) as the “investor fear gauge”, measures the market expectation of near-term volatility implied by option prices on the S&P 500 index. Because the index is derived from option prices rather than past returns, it captures anticipated rather than realized market fluctuations and reflects collective expectations of future risk.

The VIX also conveys information about investors’ risk aversion. Bollerslev, Tauchen and Zhou (2009) show that the difference between the VIX and realized variance, known as the variance risk premium, represents the compensation investors require for bearing volatility risk. Bekaert and Hoerova (2014) further divide the index into components that reflect true economic uncertainty and the price of volatility risk. These studies indicate that the VIX

should not be viewed only as a forecast of future variance but as a measure that combines objective expectations and the price of risk.

The literature establishes the VIX as a theoretically grounded and empirically validated proxy for financial uncertainty. It reflects both expected market variability and investor fear, two elements that influence trading behavior around information events. In this study, the VIX serves as the primary indicator of financial uncertainty that defines the market environment in which earnings and revenue surprises are released.

2.3.2 Economic Policy Uncertainty and Market Conditions

Uncertainty about economic policy influences both corporate behavior and financial markets. Bloom (2009) shows that temporary increases in uncertainty act as real frictions in the economy. When uncertainty rises, firms delay investment and hiring decisions until the outlook stabilizes, which illustrates how policy uncertainty can have lasting effects even when shocks are short lived. In financial markets, Pastor and Veronesi (2012) demonstrate that uncertainty about future policy actions increases risk premia and temporarily depresses valuations, even when the expected long-term effect on cash flows is positive. Their model explains why periods of political turbulence coincide with higher market volatility and weaker stock valuations.

To capture this phenomenon empirically, Baker, Bloom and Davis (2016) construct the United States Economic Policy Uncertainty (EPU) index. Empirical research confirms that the EPU index captures meaningful variation in economic and financial conditions. Gulen and Ion (2016) show that corporate investment declines when policy uncertainty increases, consistent with the real options mechanism described by Bloom (2009). Brogaard and Detzel (2015) find that innovations in the EPU index are priced in equity markets, indicating that policy uncertainty raises investors' required returns. These results support the view that policy uncertainty affects both real activity and financial valuation. In this study, the EPU index serves as the main measure of macroeconomic and policy related uncertainty, representing the institutional environment in which investors interpret earnings and revenue information.

2.3.3 Investor Sentiment: Behavioral Biases and Market Interpretation of Information

Investor sentiment represents a behavioral market state that reflects shifts in optimism and pessimism among investors, and these changes in mood influence how quickly and strongly

markets react to firm-specific information, including earnings and revenue announcements. De Long, Shleifer, Summers and Waldmann (1990) show that the presence of investors who trade on sentiment-driven beliefs unrelated to fundamentals introduces additional risk that cannot be fully diversified away. Rational investors recognise that betting against mispricing exposes them to this “noise trader” risk, which limits arbitrage and allows sentiment-driven deviations in prices to persist. Barberis, Shleifer and Vishny (1998) demonstrate that investors’ beliefs follow systematic patterns. Conservatism causes them to adjust slowly and incompletely to new information, while representativeness leads them to view recent patterns as persistent trends. Combined with limits to arbitrage, these mechanisms explain why markets may underreact to isolated news but overreact when signals accumulate over time.

Building on these theoretical insights, Baker and Wurgler (2006) develop an empirical measure of market-wide sentiment that has become standard in academic research. Their index combines several market variables that capture speculative activity and investor optimism, including the closed-end fund discount, share turnover, initial public offering activity, the dividend premium and the equity share in new issues. In subsequent work, Baker and Wurgler (2007) interpret this index as a measure of beliefs about future cash flows and risks not justified by fundamentals and show that sentiment particularly affects stocks that are difficult to value and costly to arbitrage, such as small, young and non-dividend-paying firms. Periods of high sentiment are followed by lower subsequent returns for these firms, while periods of low sentiment are associated with higher returns, indicating that sentiment-driven mispricing partially reverses over time.

Stambaugh, Yu and Yuan (2012) find that sentiment-driven overpricing is concentrated in stocks that are difficult to short sell, which limits the ability of rational investors to correct mispricing. Using the Baker and Wurgler index, they show that returns to anomaly portfolios are systematically related to sentiment, consistent with the view that sentiment conditions the strength and direction of pricing anomalies. In this study, the Baker and Wurgler index is used as a measure of market-wide sentiment to analyse whether reactions to earnings and revenue surprises differ across periods of optimism and pessimism.

2.3.4 Combined Mechanisms of Financial, Policy, and Behavioral Uncertainty

Uncertainty in financial markets originates from several interrelated sources that together determine how investors process information and price risk. Financial volatility reflects

expectations of market-wide variability, policy uncertainty represents the institutional environment shaped by unpredictable government actions, and investor sentiment captures the behavioral state of optimism or pessimism among market participants. Considering these dimensions jointly provides a more complete view of how the broader environment conditions the response to firm-specific information.

A common mechanism connects these forces through their combined influence on information precision and required returns. When the environment is more uncertain, investors interpret new signals with greater caution, which slows and dampens the adjustment of prices to information.

The literature therefore views uncertainty as a multidimensional phenomenon that affects information precision, discount rates and collective sentiment in markets. Financial, policy and behavioral conditions interact to influence the strength and timing of price responses to new information. These insights provide the foundation for the next section, which examines how earnings and revenue surprises translate into stock returns under different uncertainty regimes.

2.4 Uncertainty and its effect on earnings announcements

Earnings announcements are important events in financial markets because they update investors on recent performance and future prospects. Earnings surprises generally lead to abnormal returns, but the strength and duration of these reactions depend on the market environment. The following sections build on this idea and describe how financial, policy and behavioral conditions shape the link between earnings surprises and stock returns.

2.4.1 Theoretical Integration: Why Uncertainty Matters

Veronesi (1999) shows that markets overreact to bad news in good times and underreact to good news in bad times, indicating that market reactions to information are state dependent and shaped by prevailing uncertainty. Three mechanisms explain how this uncertainty influences the link between earnings news and stock returns: the information precision, discount rate and behavioral channels.

The first mechanism is information precision. Kim and Verrecchia (1997) show that the precision of information before the announcement and during the event period determines the size of the price response. In this framework, the earnings response coefficient depends inversely on total information precision: as uncertainty rises, the sensitivity of prices to news

declines. Zhang (2006) shows that higher information uncertainty, proxied by forecast dispersion, firm size, firm age and return volatility, is associated with higher expected returns, consistent with a premium for information risk. Together, these studies demonstrate that when the signal-to-noise ratio is low, markets react more cautiously to earnings news.

The second mechanism operates through the discount rate channel. Pastor and Veronesi (2012) show that policy uncertainty increases investors' required rate of return by raising ambiguity about future cash flows. Empirical work supports this view: high economic policy uncertainty is associated with weaker short window stock price reactions to earnings surprises and greater information asymmetry (Brogaard and Detzel, 2015; Nagar, Schoenfeld and Wellman, 2019). These findings indicate that uncertainty about government policy elevates risk premia and dampens the immediate adjustment of prices to firm specific news.

The third mechanism is behavioral. De Long, Shleifer, Summers and Waldmann (1990) show that noise trader risk limits arbitrage and allows sentiment driven mispricing to persist. Barberis, Shleifer and Vishny (1998) show that conservatism and representativeness lead investors to underweight new information when it conflicts with prior beliefs and to overweight patterns that appear consistent with recent trends.

Together, these three mechanisms describe how uncertainty alters the mapping of information into prices. Information precision affects how confidently investors interpret earnings news, policy uncertainty influences discount rates and the valuation of cash flows, and behavioral biases shape the cognitive weighting of information. Their combined influence makes the earnings–return relationship conditional on the state of the market: when uncertainty is high, price reactions are smaller, more asymmetric and less consistent with efficient information processing.

2.4.2 Empirical Evidence Across Uncertainty Dimensions

Empirical work offers only partial and mostly indirect evidence on how uncertainty affects market reactions to earnings announcements. Most studies analyse a single source of uncertainty and many of them focus on price behavior after the announcement rather than on the immediate event window.

Financial uncertainty

Bird, Choi and Yeung (2014) examine whether market volatility helps explain post-earnings-announcement drift and find that higher volatility is associated with stronger and more asymmetric post-announcement returns. This points to weaker information efficiency in more uncertain market conditions. Their analysis, however, is confined to the period after the announcement and does not cover the initial price reaction. Savor and Wilson (2016) show that systematic risk rises temporarily around earnings announcements and that investors are compensated for bearing this higher aggregate risk. Although their study does not model uncertainty directly, the results are consistent with announcement periods occurring in a riskier market state, which can make announcement outcomes more variable. Overall, existing evidence on financial uncertainty mainly relates to post-announcement behavior and leaves the direct effect on short-window earnings reactions largely unresolved.

Policy uncertainty

Nagar, Schoenfeld and Wellman (2019) document that higher economic policy uncertainty coincides with wider bid–ask spreads, lower liquidity and weaker short-window stock-price reactions to earnings surprises. Firms increase voluntary disclosure in such periods, but this only partly offsets the deterioration in market quality. Du, Ao, Chai and Ge (2023) analyse Chinese firms and show that higher policy uncertainty reduces investor attention. Lower attention slows the incorporation of earnings information and strengthens post-earnings-announcement drift. Their evidence therefore concerns delayed price adjustment rather than the announcement-day return. Taken together, these studies imply that policy-related uncertainty can hinder the transmission of earnings news into prices, but empirical support for a direct effect on the immediate market reaction is still limited.

Behavioral uncertainty

Behavioral conditions have mainly been examined through market-wide sentiment. Baker and Wurgler (2006) show that sentiment distorts valuations, especially for firms that are difficult to value or to arbitrage. This establishes sentiment as a relevant behavioral state variable. Complementary evidence is provided by Bird, Choi and Yeung (2014), who use a return-based proxy for market sentiment and show that sentiment and volatility jointly condition the strength of post-earnings-announcement drift. Their measure differs from index-based sentiment measures, but the mechanism is similar: variation in market mood affects how earnings information is weighted.

Across these strands of research, the literature points in the same direction. Financial volatility is linked to noisier post-announcement returns, policy uncertainty is linked to weaker market quality and slower incorporation of earnings information, and sentiment is linked to asymmetric follow-up reactions. Yet very few studies test directly whether these uncertainty conditions change the immediate mapping from earnings surprises to stock returns. This unresolved issue motivates the subsequent research gap and empirical analysis.

2.4.3 Conceptual Framework and Integrated Perspective

The literature reviewed above shows that uncertainty affects the earnings–return link through three established channels. These sources of uncertainty do not usually occur in isolation. Bloom (2009) documents that uncertainty shocks tend to spill over across the economy, and Diebold and Yilmaz (2012) show that volatility in one segment of financial markets transmits to others. This co-movement supports treating uncertainty as a multidimensional state rather than as a single factor.

Within this study, earnings and revenue surprises are viewed as firm specific signals that are processed inside such an uncertainty regime. Financial conditions influence how clearly the signal is read, policy conditions influence the valuation of the cash flows it implies, and behavioral conditions influence the cognitive weight investors give it. The combination of these elements determines how strong, how symmetric and how fast prices adjust. This provides the conceptual basis for testing whether announcement returns differ systematically across financial, policy and behavioral uncertainty states.

2.4.4 Research Gap and Contribution

This study addresses three gaps. First, there is little evidence that evaluates financial, policy and behavioral uncertainty within one coherent framework that allows a direct comparison of each channel's influence under harmonised specifications. Prior work treats measures such as VIX, EPU and sentiment separately, which limits what can be inferred about their relative importance for announcement returns. Second, the literature rarely evaluates revenue information alongside earnings. Revenue surprises convey operational strength and demand conditions that are not always captured by earnings. Omitting revenue can therefore lead to an incomplete view of what drives investor reactions on the announcement date. Third, much of the existing evidence is based on samples or event windows that do not match the modern disclosure and trading environment. Since the early 2000s, firms more often bundle earnings

with guidance and other line items, and price discovery has become faster. A design calibrated to this period is needed to assess how uncertainty conditions immediate reactions today.

The contributions of this study are threefold. It develops a unified event-study framework in which earnings and revenue surprises are modelled jointly and the three uncertainty measures enter together, each interacted with the news variables, so that their conditioning effects can be compared within the same specification. It evaluates earnings and revenue surprises in the same event setting, providing a more complete measure of the information set that investors process and clarifying whether uncertainty attenuates or amplifies the market impact of each component. It implements a modern sample of large United States firms over 2003–2025 and short event windows that capture the initial price adjustment, with complementary checks on follow-on dynamics, so that the evidence is aligned with the current disclosure environment. Altogether this moves the discussion from isolated effects to an integrated view across uncertainty dimensions and tests whether the strength and symmetry of announcement reactions depend on the prevailing uncertainty regime, and whether this conditioning differs for earnings and for revenue information.

3. Data

3.1 Data Sources

This study combines firm-level earnings information with market, uncertainty, and sentiment data to examine how investors react to quarterly earnings announcements under varying levels of uncertainty. All firm-specific data are obtained from FactSet, which provides comprehensive and high-quality coverage of U.S. listed firms. The sample consists of approximately 1,100 unique firms that have been part of the S&P 500 Index between 2003 and 2025. Companies are included in the sample only if they were constituents of the index at the time of the announcement, ensuring that all observations reflect large, liquid, and actively followed firms.

The earnings data come from *FactSet Estimates and Actuals*, which contain detailed quarterly information on analysts' expectations and realized performance. For each firm and fiscal quarter, the dataset includes the actual and expected values for both earnings per share (EPS) and revenue. In addition, it reports the number of analyst estimates, the range of high and low expectations, the median consensus, the surprise amount and percentage. Each observation is

linked to a specific event date, corresponding to the official earnings release as recorded by FactSet.

3.2 Sample Selection

The sample consists of all firms that have been part of the S&P 500 Index between 2003 and 2025. A firm's earnings announcement is included only if the company was a constituent of the S&P 500 at the time of the event. This ensures that all observations represent large, liquid, and actively traded firms that are closely followed by analysts. The inclusion of all sectors, including financials and utilities, provides a comprehensive view of market reactions across different industries and business models.

Firm identification is based on the FactSet ticker that corresponds to the announcement date. This approach avoids mismatches that may occur when companies are acquired or change tickers over time, ensuring that all data points are linked to the correct entity at the event date. Only firms with complete earnings and price data are retained. Observations with missing values for actual or expected EPS, revenue, or event dates are excluded from the sample. Similarly, events lacking valid stock price information around the announcement window are removed to maintain consistency across firms and periods.

Each firm may appear multiple times in the dataset, as all quarterly earnings announcements are included.

3.3 Earnings Data

The earnings data form the basis of this research and provide the independent variables used in the empirical analysis. The dataset is obtained from *FactSet Estimates and Actuals* and covers quarterly earnings announcements for all firms in the sample. Each observation represents a specific firm–quarter combination. Both earnings per share (EPS) and revenue data are included to capture different aspects of firm performance.

Each observation contains a detailed breakdown of analyst expectations and realized results. The Event Date corresponds to the exact publication date of the earnings report as recorded by FactSet. The After Event field contains the *actual* results reported by the firm, based on non-GAAP EPS and reported revenue figures. FactSet relies on non-GAAP data because it is the primary benchmark used by analysts and investors, offering better comparability across firms and time periods. Non-GAAP earnings data exclude selected items that firms classify as non-recurring or non-operating, such as restructuring charges, impairment losses or certain acquisition-related costs. FactSet reports non-GAAP EPS together with the associated

revenue figures from the same earnings release, and these series form the basis for the earnings and revenue surprises in this study. This focus aligns with market practice, as non-GAAP disclosures are the primary benchmark used by analysts and investors to assess underlying, recurring performance.

The Consensus variable represents the *median* of all analyst forecasts available in the 100-day window preceding the announcement. Analyst revisions made before the event date are incorporated in this consensus. Estimates from restricted brokers are included to prevent selection bias that could arise when companies restrict coverage following unfavourable forecasts. Finally, the dataset contains the Number of Analysts contributing to each consensus, indicating the level of analyst coverage and the reliability of the forecast. Observations with missing values for any of the core earnings variables are excluded to ensure internal consistency across firms and quarters.

3.4 Stock return data

The dependent variable in this study captures the stock market reaction to quarterly earnings announcements. All stock price data are retrieved from *FactSet Prices*, which provides daily total returns and adjusted closing prices for each firm in the sample. Each earnings event is matched with the corresponding firm's daily price and return series using the FactSet ticker and official event date. FactSet also reports the market timing of each announcement, distinguishing between results released before the market opens and those published after the market closes. This information ensures that the reaction day is aligned correctly: when earnings are released before the market opens, the reaction is captured in the closing price of the event date, while after-market releases are reflected in the closing price of the following trading day. This adjustment guarantees that the event day ($t = 0$) always corresponds to the first trading day on which investors can react to the new information.

The data span the period from 2003 to 2025 and include all trading days within a window starting 120 days before and ending 60 days after each earnings announcement. This coverage allows for the estimation of normal returns prior to the event and for the measurement of both immediate and delayed price adjustments following the release. The event windows used in this study follow standard practice in the literature: $[-1, +1]$ for the immediate market reaction and $[+2, +20]$, $[+2, +60]$ for post-earnings announcement drift (PEAD). The S&P 500 Index, obtained from FactSet Index Prices, is used as the market benchmark for computing expected returns.

Only valid trading days are included in the dataset, and any observations with missing or inconsistent price information are removed. FactSet's adjusted data automatically correct for stock splits and other structural changes, reducing the need for additional manual cleaning. All returns are expressed in percentage form and represent closing-to-closing price changes.

3.5 Uncertainty Data

3.5.1 VIX Index (Financial Uncertainty)

Financial market uncertainty is measured using the Chicago Board Options Exchange (CBOE) Volatility Index, commonly known as the VIX. The dataset contains daily closing values of the VIX for the period 2003–2025. Each earnings event in the sample is matched with the corresponding VIX observations over the same period in which price returns are measured, allowing the analysis to incorporate market-wide uncertainty directly into the event window.

All dates are formatted uniformly (YYYY-MM-DD) to ensure consistency with the firm-level datasets. Missing observations are replaced with the closest available trading-day value. The daily frequency of the VIX aligns with the stock return data and enables the measurement of short-term variation in perceived financial risk around earnings releases.

3.5.2 Economic Policy Uncertainty Index (Political Uncertainty)

Macroeconomic and political uncertainty is captured through the Economic Policy Uncertainty (EPU) Index developed by Baker, Bloom, and Davis. The dataset for the United States is obtained directly from their official website. The daily version of the index is collected for the period 2003–2025. The EPU is based on the frequency of policy-related terms appearing in major U.S. newspapers and has been widely applied to quantify shifts in policy-driven uncertainty.

In this study, the daily version is matched to the exact earnings event date. This daily structure allows policy uncertainty to be measured precisely at the time the announcement becomes public.

3.5.3 Investor Sentiment (Behavioral Uncertainty)

Behavioral market conditions are represented by the Investor Sentiment Index from Baker and Wurgler (2006), retrieved from the NYU Stern database. The index is available at a monthly frequency for the period 2003–2023 and captures prevailing investor optimism or pessimism based on multiple market indicators. Each earnings event is linked to the

sentiment value of the month in which the announcement takes place. Dates are converted to a standardized month code (YYYYMM) to ensure a consistent merge with firm-level and macroeconomic data.

This variable provides a behavioral dimension of uncertainty that complements the financial and policy-based measures, allowing for a broader understanding of how market psychology interacts with firm-specific information.

3.5.4 Combined Data and Coverage

The three uncertainty measures are combined into a single dataset covering the period 2003–2025. The VIX and daily EPU data are merged on exact calendar dates, while the monthly sentiment index is joined using the corresponding month identifier. This integrated structure ensures that each earnings event has an associated set of financial, macroeconomic, and behavioral uncertainty indicators. All datasets use uniform date formats, and missing daily values are replaced with the nearest available observation to maintain continuity.

4. Hypothesis development

Earnings announcements are among the most studied information events in financial markets. Decades of research show that unexpected earnings news conveys value-relevant information that leads to abnormal stock returns (Ball & Brown, 1968; Bernard & Thomas, 1989). Yet, the magnitude and speed of these market reactions are not constant. Factors such as investor sentiment, financial volatility, and policy-related uncertainty can shape how strongly investors respond to firm-specific information (Baker & Wurgler, 2006; Bird, Choi & Yeung, 2014; Pastor & Veronesi, 2012).

Building on these insights, this study develops hypotheses that test whether earnings and revenue surprises are associated with abnormal stock returns and how this relationship varies across different forms of uncertainty. The following sections formulate hypotheses for the baseline effect of earnings and revenue surprises, the relative strength of each measure, and the moderating roles of investor sentiment, financial uncertainty, and economic policy uncertainty.

4.1 Baseline Relationship: Earnings and Revenue Surprises

Earnings announcements represent key information events through which firms disclose new insights about their financial performance. Classic studies demonstrate that unexpected

earnings news conveys value-relevant information that investors incorporate into prices, generating abnormal stock returns (Ball & Brown, 1968; Beaver, 1968; Bernard & Thomas, 1989). Positive surprises typically raise expectations of future cash flows, while negative surprises reduce them, leading to price adjustments consistent with the semi-strong form of market efficiency.

As investors revise their expectations in response to these announcements, stock prices adjust to reflect the updated assessment of firm value.

Based on these insights, the first hypothesis establishes the expected direction of the market reaction to earnings and revenue news:

H1: *Positive earnings and revenue surprises are associated with positive abnormal stock returns, whereas negative surprises are associated with negative abnormal returns.*

4.2 Relative Informativeness of Earnings and Revenue Surprises

While both earnings and revenue surprises convey value-relevant information to investors, prior research shows that the market does not process them with equal strength or timing. Earnings per share (EPS) capture overall profitability and are directly linked to valuation metrics such as the price-to-earnings ratio, whereas revenue reflects the underlying level of operational performance and market demand. Both measures therefore inform investors about firm fundamentals, but through different economic channels.

Although the relative importance of these measures can vary across firms and contexts, the general expectation is that earnings surprises produce stronger immediate market reactions on average.

Based on this reasoning, the second hypothesis is formulated as follows:

H2: *Stock market reactions to earnings (EPS) surprises are stronger than reactions to revenue surprises.*

4.3 Behavioral Uncertainty: Investor Sentiment

Beyond rational information processing, investor psychology conditions how earnings news is mapped into prices. Established behavioral theories and evidence indicate that prevailing sentiment shapes belief updating and risk appetite, so that identical signals can elicit differently sized reactions across market states (e.g., De Long et al., 1990; Barberis, Shleifer, and Vishny, 1998; Baker and Wurgler, 2007). In this study, sentiment is treated as a behavioral state variable that moderates the announcement-period sensitivity to earnings and revenue information.

The moderating role of sentiment is evaluated in the short event window around the release. Announcement returns are measured as CAR $[-1, +1]$. Sentiment is proxied by the Baker–Wurgler index, available at a monthly frequency; each event is assigned the contemporaneous month's value (using the last available observation when necessary). Moderation is assessed by interacting sentiment with standardized surprises in earnings per share and in revenue.

H3: *When investor sentiment is higher, positive earnings and revenue surprises are associated with larger announcement-period abnormal returns, and negative surprises are associated with more pronounced negative abnormal returns over the same window.*

4.4 Financial Uncertainty: Market Volatility (VIX)

Financial uncertainty conditions how firmly earnings news is translated into prices. The VIX, captures both anticipated variance and a volatility risk premium and is widely used as a forward-looking proxy for market uncertainty (e.g., Whaley, 2000; Bekaert and Hoerova, 2014). In more volatile states investors are more cautious and require higher compensation for risk, so identical firm-level signals tend to move prices less.

Two mechanisms motivate this prediction. First, when the information environment is noisier the effective precision of the earnings signal is lower and announcement-period adjustments are more muted (Kim and Verrecchia, 1997). Second, volatility co-moves with temporarily elevated systematic risk around announcements, which raises required returns and dilutes the valuation impact of news (Savor and Wilson, 2016).

The moderating role of financial uncertainty is evaluated in the short event window around the release. Announcement returns are measured as CAR $[-1, +1]$. Financial uncertainty is proxied by the VIX at daily frequency, each event is matched to the contemporaneous value, or the last available close when needed. Moderation is evaluated by allowing the announcement-period sensitivity to standardized surprises in EPS and in revenue to vary with the VIX level.

H4: *When market volatility, measured by the VIX, is higher, positive surprises in EPS and in revenue are associated with smaller announcement-period abnormal returns, and negative surprises are associated with less negative announcement-period abnormal returns over the same window.*

4.5 Policy Uncertainty: Economic Policy Uncertainty (EPU)

Economic policy uncertainty (EPU) reflects ambiguity about the timing, direction, and consequences of government actions and thus raises the risk premium investors require. The

Baker–Bloom–Davis EPU index is a widely used proxy for this uncertainty. When policy uncertainty is elevated, investors become more cautious and value firm-specific signals less aggressively, consistent with state-dependent discounting and frictions in information processing (e.g., Veronesi, 1999; Brogaard and Detzel, 2015; Bloom, 2009).

The moderating role of policy uncertainty is evaluated in the short announcement window. Abnormal returns are cumulated over trading days -1 to $+1$ around the release, CAR $[-1, +1]$. Policy uncertainty is proxied by the U.S. EPU index at daily frequency; each event is assigned the contemporaneous day's value (using the last available observation when needed). Moderation is assessed by allowing the announcement-period sensitivity to standardized surprises in EPS and in revenue to vary with EPU.

H5: *When economic policy uncertainty is higher, positive surprises in EPS and in revenue are associated with smaller announcement-period abnormal returns, and negative surprises are associated with less negative announcement-period abnormal returns over the same window.*

4.6 Post-announcement adjustment and uncertainty

Price discovery around earnings announcements may not be completed within the initial window. When uncertainty is elevated, investors tend to update beliefs more cautiously and require stronger confirmation before revising valuations. Three forces make delayed adjustment plausible. First, lower information precision reduces the weight placed on the earnings signal, so part of the response is postponed until additional signals arrive. Second, higher discount-rate ambiguity encourages a wait-and-see posture in which firm-specific news is priced less aggressively on the day of release. Third, behavioral frictions such as low sentiment or limited attention dampen immediate trading intensity, allowing residual adjustment to unfold after the announcement. These mechanisms imply that uncertainty conditions not only the size of the announcement reaction but also the timing of information incorporation. In calm markets, earnings and revenue surprises are reflected in prices swiftly and largely contemporaneously. In unsettled markets, a meaningful share of the total response is expected to occur after the event as beliefs converge more slowly.

This hypothesis is included to complement the short-window analysis with an explicit timing dimension. The study primarily tests how uncertainty moderates announcement-period returns, but for completeness it also examines whether the same uncertainty states shift part of the price adjustment to the days that follow. Testing this extension helps distinguish

weaker immediate reactions from genuinely smaller overall reactions and clarifies whether uncertainty slows, rather than merely shrinks, the mapping from earnings news to prices.

H6: *During periods of higher financial or policy uncertainty, and during periods of lower investor sentiment, post-announcement abnormal returns continue in the direction of the earnings and revenue surprises disclosed at the announcement, indicating slower incorporation of information into prices.*

5. Methodology

This chapter sets out the empirical design used to test the hypotheses from Chapter 4. The study examines how quarterly earnings and revenue surprises affect stock returns and how these effects vary with market uncertainty, using a standard event-study framework.

Abnormal returns are measured around earnings announcement dates for large U.S. firms included in the S&P 500 over 2000–2025. Short-window event studies are well suited when announcement timing is known. Firm-level earnings data from FactSet are combined with financial, policy and behavioral uncertainty measures to assess how information processing depends on the market environment.

5.1 Empirical Design

The design follows MacKinlay (1997). Events are the official quarterly release dates recorded by FactSet. For each firm quarter, the event date is the first trading day on which investors can react, which aligns both pre-market and after-market releases.

Daily stock returns come from FactSet Prices and are merged with daily S&P 500 returns as the market benchmark. Expected returns are estimated with the market model

$$R_{i,t} = \alpha_i + \beta_i R_{m,t} + \varepsilon_{i,t}$$

where $R_{i,t}$ is the daily return of firm i and $R_{m,t}$ the daily return of the S&P 500. Parameters α_i and β_i are estimated over an estimation window of 120 trading days ending 10 days before the announcement $[-120, -10]$, which avoids the pre-announcement period.

Abnormal returns are the residuals from the market model,

$$AR_{i,t} = R_{i,t} - (\hat{\alpha}_i + \hat{\beta}_i R_{m,t})$$

and cumulative abnormal returns are formed as

$$CAR_{i,[t_1,t_2]} = \sum_{t=t_1}^{t_2} AR_{i,t}$$

The main event window is set to $[-1, +1]$ trading days around day 0, where day 0 is the first trading day after the earnings release, regardless of whether the firm reports before the open or after the close. This window captures the immediate reaction and is used for Hypotheses 1 to 5, consistent with Brown and Warner (1985). Day -1 is included because part of the reaction to after-close announcements and short-horizon information leakage can already be reflected in prices before day 0, while day $+1$ captures delayed trading and microstructure frictions that can cause a small part of the adjustment to occur with a one-day lag. To assess continued adjustment, a post-announcement window $[+2, +20]$ is analyzed for Hypothesis 6, and a longer $[+2, +60]$ window is used as robustness check to match Bernard and Thomas (1989). Observations with missing data are excluded. Continuous variables, including CARs and surprises, are winsorized at the 1st and 99th percentiles.

5.1.1 Earnings and Revenue Surprises

The key independent variables capture the unexpected component of quarterly results.

Earnings news is measured using FactSet's Standardized Unexpected Earnings:

$$SUE_{i,t} = \frac{Actual_{i,t} - Consensus_{i,t}}{StdDevEstimates_{i,t}}$$

where $Actual_{i,t}$ is *reported non GAAP EPS*, $Consensus_{i,t}$ is the median analyst forecast, and $StdDevEstimates_{i,t}$ is the cross sectional dispersion of estimates prior to the announcement. This scaling reflects the precision of expectations rather than historical volatility. In line with information precision theory, higher SUE indicates a stronger signal.

An analogous measure is constructed for sales (revenue)

$$SUR_{i,t} = \frac{ActualSales_{i,t} - ConsensusSales_{i,t}}{StdDevSalesEstimates_{i,t}}$$

The SUE and SUR variables are winsorized at the 1st and 99th percentiles. Observations with fewer than two analyst estimates are excluded.

5.1.2 Uncertainty variables

The analysis tests whether market-wide uncertainty conditions reactions to earnings and revenue. The analysis tests whether market-wide uncertainty conditions reactions to earnings and revenue surprises. Three dimensions are considered and merged to events on the announcement date. Financial uncertainty is proxied by the VIX, the option-implied volatility of the S&P 500 over the next 30 days. The daily closing value on the first trading day when investors can react is assigned to each event. Policy uncertainty is measured by the daily U.S.

Economic Policy Uncertainty index of Baker, Bloom and Davis. For non-trading-day announcements, the closest available observation is used. Behavioral uncertainty is proxied by the Baker–Wurgler investor sentiment index. Because sentiment is monthly, each event is linked to the value for the corresponding month. Higher sentiment indicates more optimism and lower behavioral uncertainty. All uncertainty variables are standardized to z-scores so that coefficients on earnings or revenue surprises reflect effects at average uncertainty and per one-standard-deviation change in the index. VIX and EPU are winsorized at the 1st and 99th percentiles to limit the influence of crisis spikes.

5.2 Regression Framework and Model Specification

This section describes the regression models used to test the hypotheses developed in Chapter 4. The analyses link earnings and revenue surprises to abnormal stock returns and examine whether these relationships vary across different forms of market uncertainty.

All models follow the standard event-study regression approach used in capital-market research (Brown & Warner, 1985; MacKinlay, 1997).

The hypotheses in Chapter 4 are formulated as restrictions on the sign and relative magnitude of regression coefficients. In the empirical implementation, linear regressions are combined with Wald tests of equality restrictions such as joint null hypotheses on earnings and revenue coefficients or equality restrictions across coefficients. Test outcomes are interpreted together with the estimated signs and ordering of the coefficients, and results are treated as consistent with a given hypothesis only when the relevant equality null is rejected and the estimated coefficients display the sign pattern implied by that hypothesis.

5.2.1 Baseline Model

The baseline specification measures the sensitivity of abnormal stock returns to quarterly earnings and revenue surprises. The dependent variable is the cumulative abnormal return in basis points over the short event window $[-1, +1]$, which captures the immediate price response to new information. Both earnings and revenue surprises are entered jointly as standardized measures based on FactSet $\left(\frac{\text{Actual}-\text{Consensus}}{\text{StdDevEstimates}}\right)$. Observations with fewer than two analyst estimates are excluded. The event date is defined as the first trading day on which investors can react to the release, with pre-market and after-market announcements aligned

accordingly. Sector fixed effects are included, and standard errors are clustered at the firm level.

The baseline model is

$$CAR_{i,t}^{[-1,+1]} = \alpha + \beta_1 SUE_{i,t} + \beta_2 SUR_{i,t} + X_{i,t} + \eta_{s(i)} + \varepsilon_{i,t}$$

where $X_{i,t}$ contains $\log(\text{Size})$ and $\eta_{s(i)}$ denotes sector effects. Hypothesis H1 states that both β_1 and β_2 are positive, while H2 states that the response to earnings surprises is at least as large as the response to revenue surprises. Two Wald tests translate these economic restrictions into equality-based null hypotheses. The joint test of $H_0: \beta_1 = 0, \beta_2 = 0$ assesses whether earnings and revenue surprises are jointly priced in the announcement window and is used to evaluate H1. The test of $H_0: \beta_1 = \beta_2$ assesses whether the two coefficients are equal and is used to evaluate H2. In the interpretation of the results, evidence is treated as consistent with H1 and H2 when the joint null is rejected, both coefficients are positive and precisely estimated, and the equality null is rejected with a larger coefficient on SUE than on SUR. Main tables use $[-1, +1]$; alternative windows $[0, +2]$ and $[-3, +3]$ are reported as robustness, with a common sample used across columns within each table.

5.2.2 Moderating role of uncertainty

To examine how uncertainty conditions the relation between earnings, revenue and announcement-window abnormal returns, a joint regression is estimated that includes the three proxies simultaneously: financial uncertainty (VIX), economic policy uncertainty (EPU) and investor sentiment (Baker–Wurgler). Each proxy is measured on the event day and standardized to a z-score so that coefficients can be interpreted in basis points per one standard deviation change in the index. The joint specification extends the baseline model by adding the three uncertainty variables and their interactions with both earnings and revenue surprises. To check robustness and to exploit the longer sample for VIX and EPU, separate moderation regressions are also estimated per proxy; these are reported in the appendix.

The main announcement-window regression is

$$\begin{aligned} CAR_{i,t}^{[-1,+1]} = & \alpha + \beta_1 SUE_{i,t} + \beta_2 SUR_{i,t} + \theta_1 VIX_t + \theta_2 EPU_t + \theta_3 BW_t + \delta_{1,V}(SUE_{i,t}VIX_t) \\ & + \delta_{1,E}(SUE_{i,t}EPU_t) + \delta_{1,B}(SUE_{i,t}BW_t) + \delta_{2,V}(SUR_{i,t}VIX_t) \\ & + \delta_{2,E}(SUR_{i,t}EPU_t) + \delta_{2,B}(SUR_{i,t}BW_t) + X_{i,t} + \eta_{s(i)} + \varepsilon_{i,t} \end{aligned}$$

Here $CAR_{i,t}^{[-1,+1]}$ is the cumulative abnormal return around the announcement for firm i and event t . $SUE_{i,t}$ and $SUR_{i,t}$ are the standardized earnings and revenue surprises. VIX_t , EPU_t

and BW_t are the standardized uncertainty indices on the event day, $X_{i,t}$ contains firm-level controls including $\log(\text{Size})$, $\eta_{s(i)}$ denotes sector fixed effects and $\varepsilon_{i,t}$ is the error term.

The interaction coefficients $\delta_{1,\cdot}$ capture how the sensitivity of announcement returns to earnings surprises varies with each uncertainty proxy, and $\delta_{2,\cdot}$ do the same for revenue surprises. Hypotheses H3–H5 focus on the sign and relative magnitude of these interaction terms. Three Wald tests summarise the evidence. A first test considers the joint null that all earnings–uncertainty interactions are zero, a second test does the same for all revenue–uncertainty interactions, and a third test covers all six interaction terms together. Results are interpreted as consistent with H3–H5 when these null hypotheses are rejected in the expected direction and the interaction coefficients display the sign pattern implied by the corresponding hypothesis. As in the baseline, alternative windows $[0, +2]$ and $[-3, +3]$ are also estimated for robustness, with controls, fixed effects, winsorization, clustering and common-sample handling as in Section 5.2.1.

5.2.3 Post-announcement adjustment (PEAD extension)

This section examines whether part of the price response materializes after the announcement and whether this depends on contemporaneous uncertainty. Two post-announcement windows are used: $[+2, +20]$ and $[+2, +60]$. The dependent variable is the cumulative abnormal return in basis points over the post-announcement window, denoted $CAR_{i,t}^{[+2,+h]}$ with $h \in \{20,60\}$. Earnings and revenue surprises enter jointly as standardized measures. Uncertainty is measured on the event day. Sector fixed effects are included, and standard errors are clustered at the firm level. All continuous variables, including CARs and surprises, are winsorized at the 1st and 99th percentiles. The post-announcement window starts at day +2 so that the $[-1, +1]$ interval is reserved for the immediate announcement reaction and is not double counted in the post period.

Pure post-announcement adjustment

True post-announcement adjustment is isolated by conditioning on the announcement-window return:

$$CAR_{i,t}^{[+2,+h]} = \alpha + \beta_1 SUE_{i,t} + \beta_2 SUR_{i,t} + \gamma CAR_{i,t}^{[-1,+1]} + X_{i,t} + \eta_{s(i)} + \varepsilon_{i,t}, \quad h \in 20,60$$

Here $CAR_{i,t}^{[-1,+1]}$ is the announcement-window return, $X_{i,t}$ contains $\log(\text{Size})$, and $\eta_{s(i)}$ denotes sector effects. The coefficients β_1 and β_2 measure whether earnings and revenue

surprises predict post-announcement returns after controlling for the initial price reaction; this is the focus of H6. The coefficient γ captures whether larger announcement-window moves tend to be followed by continuation or reversal in subsequent returns. Joint Wald tests of $H_0: \beta_1 = \beta_2 = 0$ assess whether there is any systematic post-announcement adjustment associated with the news, while tests of $H_0: \beta_1 = \beta_2$ compare the strength of post-announcement adjustment for earnings versus revenue surprises. These tests summarize the evidence for H6 in the absence of uncertainty interactions.

Moderation of post-announcement adjustment by uncertainty

The role of uncertainty in the timing of price discovery is analyzed by extending the post-announcement specification with the three uncertainty proxies used in the announcement window. The joint regression is:

$$\begin{aligned} CAR_{i,t}^{[+2,+h]} = & \alpha + \beta_1 SUE_{i,t} + \beta_2 SUR_{i,t} + \theta_1 VIX_t + \theta_2 EPU_t + \theta_3 BW_t + \delta_{1,V}(SUE_{i,t}VIX_t) \\ & + \delta_{1,E}(SUE_{i,t}EPU_t) + \delta_{1,B}(SUE_{i,t}BW_t) + \delta_{2,V}(SUR_{i,t}VIX_t) \\ & + \delta_{2,E}(SUR_{i,t}EPU_t) + \delta_{2,B}(SUR_{i,t}BW_t) + \gamma CAR_{i,t}^{[-1,+1]} + X_{i,t} + \eta_{s(i)} \\ & + \varepsilon_{i,t}, \quad h \in 20,60. \end{aligned}$$

Here $CAR_{i,t}^{[+2,+h]}$ is the post-announcement cumulative abnormal return for firm i over window $[+2, +h]$, and $CAR_{i,t}^{[-1,+1]}$ is the announcement-window return. $SUE_{i,t}$ and $SUR_{i,t}$ are the standardized earnings and revenue surprises. VIX_t , EPU_t and BW_t are the standardized uncertainty indices on the event day, $X_{i,t}$ contains firm-level controls including $\log(\text{Size})$, $\eta_{s(i)}$ denotes sector fixed effects and $\varepsilon_{i,t}$ is the error term.

The coefficients $\delta_{1,\cdot}$ capture how delayed adjustment to earnings surprises depends on each uncertainty proxy, conditional on the initial reaction, and the coefficients $\delta_{2,\cdot}$ do the same for revenue surprises. As in the announcement-window analysis, three Wald tests summarise the moderating role of uncertainty: one joint test for all earnings–uncertainty interaction terms, one joint test for all revenue–uncertainty interaction terms, and one joint test for all six interactions together. Results for H6 are interpreted by combining these tests with the sign and magnitude of the interaction coefficients. For robustness, additional post-announcement regressions are estimated separately for VIX, EPU and BW, using the same structure but one proxy at a time; these single-proxy specifications are reported in the appendix.

5.2.4 Estimation Details and Diagnostics

All regressions are estimated in R using ordinary least squares with heteroskedasticity-robust standard errors clustered by firm (ticker) to account for within-firm correlation over time.

Key continuous variables used in the return regressions, including CARs, earnings and revenue surprises, and the VIX and EPU proxies, are winsorized at the 1st and 99th percentiles.

Robustness checks include alternative event windows ($[0, +2]$ and $[-3, +3]$)

5.3 Robustness and Additional Tests

To check that the empirical results are not driven by specific modelling choices or data construction decisions, a set of robustness and consistency checks is implemented. These checks examine whether the estimated relationships between earnings and revenue surprises, abnormal returns and the uncertainty proxies remain stable when alternative event windows are used. The procedures follow standard practice in event-study research and are applied uniformly across the main specifications.

5.3.1 Alternative Event Windows

The main analyses use the cumulative abnormal return over $[-1, +1]$ as the announcement window, capturing the immediate market response to quarterly results. To verify that the findings are not sensitive to this specific choice, all baseline and moderation regressions are re-estimated for two additional horizons: a shorter $[0, +2]$ window and a slightly wider $[-3, +3]$ window. Comparing coefficients across these windows allows a check on whether earnings and revenue surprises have consistent directional effects and whether key patterns depend on including one extra pre- or post-announcement day. Stable estimates across the three windows indicate that the results do not hinge on the exact definition of the announcement period and that price reactions are not confined to a single trading day.

5.3.2 Uncertainty Controls in Baseline Regressions

The baseline announcement-window regressions for H1 and H2 include earnings and revenue surprises, firm size and sector fixed effects. As an additional robustness check, the three uncertainty proxies $VIX(z)$, $EPU(z)$ and BW sentiment (z) are added as controls to the baseline specification without interaction terms. This allows a direct assessment of whether the earnings- and revenue-surprise coefficients that underpin H1 and H2 are affected by contemporaneous financial, policy or sentiment conditions. Comparing the baseline and

augmented specifications shows whether the core relation between news and announcement-period CAR is robust to controlling for common uncertainty states that may be correlated with both returns and surprises.

6. Results

6.1 Description Table

Table 1 summarizes the data used in the analysis. The full dataset contains 43,318 quarterly earnings announcements for S&P 500 firms between 2003 and 2025, while Panel A reports descriptive statistics for the 42,894 events that enter the main H1–H2 regressions.

Announcement-window abnormal returns, expressed in basis points, are centered close to zero: CAR $[-1, +1]$ has a mean of about -2 bps, with a range from roughly -18% to $+17\%$. The wider windows show similar dispersion around zero in the short run and much larger moves over longer horizons, with CAR $[+2, +60]$ reaching values beyond $\pm 30\%$.

Earnings and revenue surprises are on average positive. The standardized earnings surprise (SUE) has a mean of about 1.5 and a median just above 1, while the corresponding revenue measure (SUR) is smaller, consistent with earnings being more volatile than revenue. Firms in the sample are large and liquid, with median log-size around 9.8, and analyst coverage is dense: the median number of EPS estimates is 15 and for revenue 11, indicating that consensus forecasts are based on sizeable analyst pools.

Panel B shows the behavior of the uncertainty proxies over the same period. The VIX varies between roughly 10 and 55, the EPU index ranges from about 20 to just above 500, and Baker–Wurgler sentiment moves from clearly negative to strongly positive values. In the regressions these variables are standardized to z-scores so that coefficients can be interpreted per one-standard-deviation change in each index.

Table 1, Panel A: Descriptive statistics – returns, news and firm characteristics

Variable	N	Mean	SD	P25	Median	P75	Min	Max
CAR [-1, +1] (bps)	42,894	-2.101	574.876	-309.977	1.876	321.854	-1,767.811	1,663.182
CAR [0, +2] (bps)	42,894	-7.373	574.870	-316.545	-1.829	316.256	-1,802.929	1,638.293
CAR [-3, +3] (bps)	42,894	-2.936	622.075	-346.562	1.519	351.681	-1,897.917	1,781.704
CAR [+2, +20] (bps)	42,893	1.814	552.436	-315.748	-7.290	305.831	-1,576.966	1,723.071
CAR [+2, +60] (bps)	42,893	-16.916	1,130.572	-668.484	-22.901	613.106	-3,244.048	3,403.072
SUE (EPS)	42,894	1.456	2.950	0.000	1.038	2.571	-6.863	13.656
SUR (Revenue)	42,894	0.656	2.496	-0.504	0.392	1.594	-7.433	11.679
Size (log)	42,894	9.875	1.118	9.110	9.762	10.554	7.534	12.930
# Estimates (EPS)	42,894	15.876	7.073	11.000	15.000	20.000	3.000	37.000
# Estimates (Revenue)	42,894	12.006	7.154	6.000	11.000	16.000	2.000	35.000

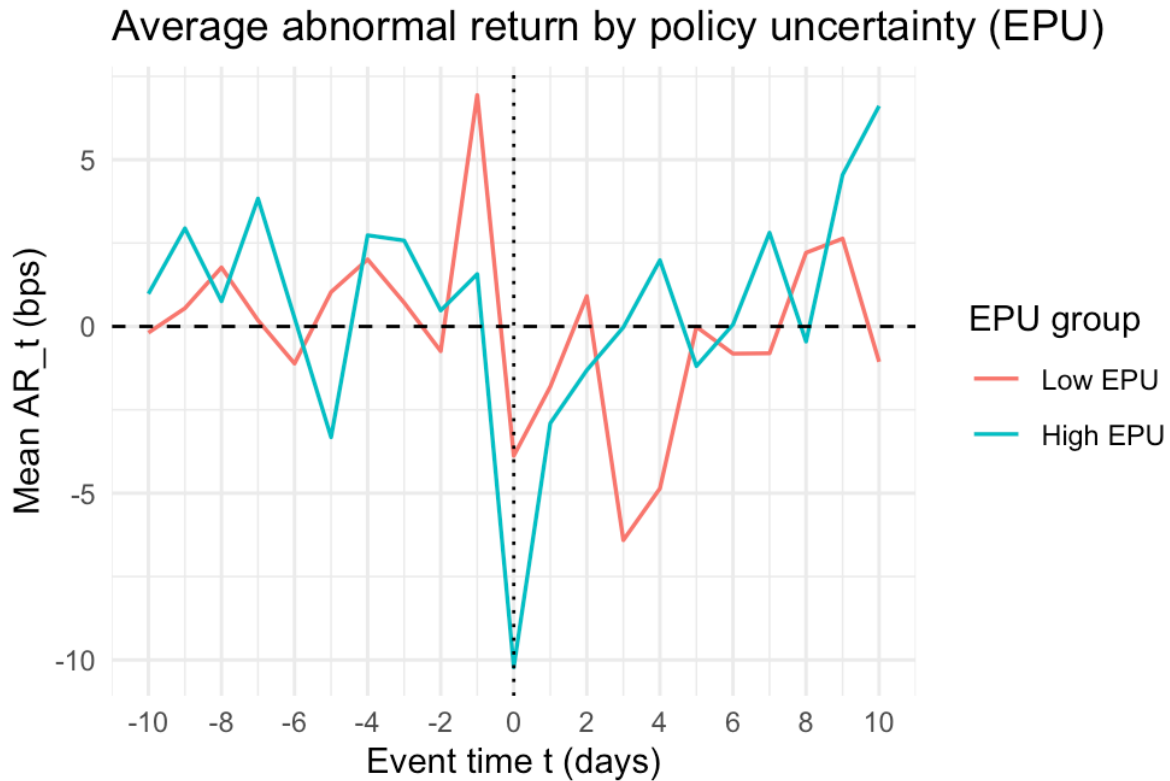
Table 1, Panel B: Descriptive statistics – uncertainty and sentiment variables

Variable	N	Mean	SD	P25	Median	P75	Min	Max
VIX	43,318	18.917	7.692	13.65	16.720	21.72	9.970	54.560
EPU	43,318	121.033	93.996	61.00	91.645	144.24	19.920	515.910
BW Sentiment	39,534	-0.040	0.560	-0.34	-0.193	0.11	-0.896	2.069

Figure 1 illustrates the typical time pattern of announcement returns using policy uncertainty as an example. It plots the average daily abnormal return from $t = -10$ to $t = +10$ around the earnings announcement, separately for high- and low-EPU states. Both lines are close to zero in the days before the event, followed by a sharp negative spike at $t = 0$ and a partial rebound afterwards. The shape of the reaction is similar across the two groups, although the announcement-day drop is somewhat larger when policy uncertainty is high. Overall, the figure shows that earnings announcements are associated with a clear, short-lived price

reaction, while differences between high and low EPU mainly affect the depth of the initial move rather than the timing of the adjustment.

Figure 1



6.2 Results (H1-H2)

The baseline regressions show a clear and strong reaction of stock prices to quarterly news. Across all three event windows, earnings and revenue surprises are both positively related to announcement-period abnormal returns, and the response to earnings is systematically larger. This is consistent with H1 and with the idea that EPS carries more immediate pricing weight than revenue, as stated in H2.

Table 2 reports the estimates for CAR $[-1, +1]$, CAR $[0, +2]$ and CAR $[-3, +3]$, all in basis points per one standard deviation of the surprise. In the main window $[-1, +1]$, the earnings coefficient is around 43–46 bps, while the revenue coefficient is about 26–28 bps. The alternative windows $[0, +2]$ and $[-3, +3]$ yield very similar magnitudes, indicating that most of the price adjustment takes place on the announcement day and the immediately surrounding days, rather than leaking in earlier or being delayed. Firm size enters with a small and insignificant coefficient, suggesting that conditional on the news there is no strong size pattern in short-horizon announcement returns. Appendix **Table A1** shows that the earnings and revenue coefficients are virtually unchanged when $VIX(z)$, $EPU(z)$ and BW

sentiment (z) are added as additional controls, so the baseline relation is not driven by omitted variation in uncertainty states. All regressions include sector fixed effects and firm-clustered standard errors, and adjusted R² is around 7–8%, which is in line with typical announcement-return studies.

Table 2. Earnings and revenue surprises and announcement-window abnormal returns			
	CAR [-1, +1] (bps)	CAR [0, +2] (bps)	CAR [-3, +3] (bps)
	(1)	(2)	(3)
Earnings surprise	45.7*** (1.8)	42.9*** (1.7)	44.3*** (1.7)
Revenue surprise	27.8*** (1.7)	26.2*** (1.6)	27.0*** (1.7)
Size (log)	2.9 (3.0)	2.5 (2.8)	1.7 (2.9)
N	42894	42894	42894
Adj. R ²	0.072	0.075	0.068
Sector FE	Yes	Yes	Yes
SE clustering	Firm	Firm	Firm
H1: $\beta_{EPS} = \beta_{Revenue} = 0$ (p-value)	< 0.0001	< 0.0001	< 0.0001
H2: $\beta_{EPS} = \beta_{Revenue}$ (p-value)	< 0.0001	< 0.0001	< 0.0001

The Wald tests at the bottom of **Table 2** provide the formal link to H1 and H2. The joint null hypothesis $H_0: \beta_{EPS} = \beta_{Sales} = 0$ is strongly rejected in all three windows ($p < 0.0001$), while both coefficients on SUE and SUR are positive and precisely estimated. This indicates that quarterly earnings and revenue surprises are jointly priced in the announcement window, consistent with H1. The equality null $H_0: \beta_{EPS} = \beta_{Sales}$ is also strongly rejected ($p < 0.0001$) in all specifications, and the earnings coefficient is uniformly larger than the revenue coefficient. This supports H2, which predicts that investors respond more strongly to EPS surprises than to revenue surprises in the announcement window.

6.3 Results (H3-H5)

This section examines whether uncertainty moderates the announcement-window relation between earnings, revenue surprises and abnormal returns. Three proxies are considered: financial uncertainty (VIX), economic policy uncertainty (EPU) and investor sentiment

(Baker–Wurgler). The primary evidence comes from a joint specification in which all three proxies and their interactions with earnings and revenue surprises are included simultaneously, so that their effects are evaluated conditional on each other. To gauge robustness and to exploit the longer sample for VIX and EPU, separate moderation regressions are also estimated per proxy; these are reported in the appendix and used to check whether the main patterns are sensitive to sample coverage and model specification.

Table 3 reports the joint moderation regressions for VIX, EPU and BW sentiment for CAR $[-1, +1]$, CAR $[0, +2]$ and CAR $[-3, +3]$. The main effects of earnings and revenue surprises remain positive and highly significant, with earnings surprises linked to roughly 44–47 bps and revenue surprises to about 26–27 bps of abnormal return, very close to the baseline results.

The interaction block shows that uncertainty primarily affects the reaction to earnings news. The three earnings–uncertainty interactions are sizeable and statistically significant, whereas the three revenue–uncertainty interactions are small and imprecise. The joint Wald statistics for the interaction terms confirm this pattern. For earnings, the null hypothesis that all three earnings–uncertainty interactions are jointly equal to zero is rejected in each window, while for revenue the corresponding joint test cannot be rejected. Combined with the signs and magnitudes of the coefficients, this indicates that uncertainty mainly moderates the reaction to earnings surprises and has little systematic impact on the pricing of revenue surprises.

Table 3. Joint moderation of announcement-window abnormal returns by VIX, EPU and BW sentiment

	CAR [-1, +1] (bps)	CAR [0, +2] (bps)	CAR [-3, +3] (bps)
	(1)	(2)	(3)
Earnings surprise	47.1*** (1.9)	44.3*** (1.7)	45.5*** (1.8)
Revenue surprise	27.2*** (1.8)	25.8*** (1.6)	26.7*** (1.7)
VIX (z)	11.8** (5.4)	12.2*** (4.3)	6.4 (4.6)
EPU (z)	-5.2 (5.0)	-8.8* (4.6)	-0.2 (4.9)
BW sentiment (z)	-11.2*** (3.5)	-8.4** (3.4)	-7.6** (3.5)
Earnings surprise × VIX(z)	6.7*** (2.3)	4.8*** (1.8)	7.4*** (2.0)
Revenue surprise × VIX(z)	-1.1 (2.3)	-1.3 (1.8)	-1.5 (1.9)
Earnings surprise × EPU(z)	-6.4*** (1.9)	-4.7*** (1.6)	-7.9*** (1.8)
Revenue surprise × EPU(z)	1.4 (2.0)	1.5 (1.8)	1.5 (2.0)
Earnings surprise × BW(z)	-5.7*** (1.2)	-4.9*** (1.1)	-5.6*** (1.2)
Revenue surprise × BW(z)	-0.4 (1.2)	0.5 (1.2)	-0.1 (1.3)
Size (log)	8.3*** (3.0)	7.7*** (2.9)	6.0** (2.9)
N	39376	39376	39376
Adj. R ²	0.075	0.078	0.071
Sector FE	Yes	Yes	Yes
SE clustering	Firm	Firm	Firm
VIX interactions (EPS & Revenue) = 0 (p-value)	0.0150	0.0260	0.0009
EPU interactions (EPS & Revenue) = 0 (p-value)	0.0033	0.0153	< 0.0001
BW interactions (EPS & Revenue) = 0 (p-value)	< 0.0001	< 0.0001	< 0.0001
Joint EPS interactions (VIX/EPU/BW): $\delta_{\text{EPS}} = 0$ (p-value)	< 0.0001	< 0.0001	< 0.0001
Joint Revenue interactions (VIX/EPU/BW): $\delta_{\text{Revenue}} = 0$ (p-value)	0.8763	0.8135	0.8361
All interactions: $\delta_{\text{EPS}} = \delta_{\text{Revenue}} = 0$ (p-value)	< 0.0001	0.0001	< 0.0001

H3 Investor sentiment

Investor sentiment, measured by the Baker–Wurgler index and standardized as $BW(z)$, moderates announcement-period reactions in a way that runs counter to H3. In the joint specification of **Table 3**, where BW sentiment enters alongside VIX and EPU , the main effect of $BW(z)$ on CAR is negative in all three windows: about -11.2 bps in $[-1, +1]$, -8.4 bps in $[0, +2]$ and -7.6 bps in $[-3, +3]$. This points to slightly lower average announcement returns in high-sentiment periods, conditional on earnings, revenue and the other uncertainty proxies. The interaction terms show that this effect works mainly through earnings. The earnings– BW interactions are negative and precisely estimated at roughly -5.7 , -4.9 and -5.6 bps per $+1\sigma$ increase in $BW(z)$ across the three windows, while the revenue– BW interactions are very small, between about -0.4 and $+0.5$ bps, and not statistically different from zero. In practical terms, a given positive earnings surprise translates into a weaker abnormal return when sentiment is high than when sentiment is low, while the response to revenue surprises is largely unchanged across sentiment states.

The joint Wald statistics for the BW -related interaction block are consistent with this pattern. The null that the earnings– BW interaction coefficients are jointly equal to zero is rejected at conventional levels in all three windows, whereas the corresponding joint test for the revenue– BW interactions cannot be rejected. Combined with the sign pattern of the coefficients, this implies that higher BW sentiment reduces rather than strengthens the sensitivity of announcement returns to earnings news and does not materially change the pricing of revenue surprises. H3 therefore has to be rejected: the data support the opposite of the hypothesized effect.

H4 Financial uncertainty

Financial market uncertainty, measured by the VIX index and standardized as $VIX(z)$, does not give a clean confirmation of H4. In the joint specification of **Table 3**, where VIX appears together with EPU and BW sentiment, the main effect of $VIX(z)$ on CAR is modestly positive: about 11.8 bps in $[-1, +1]$, 12.2 bps in $[0, +2]$ and 6.4 bps in $[-3, +3]$. This points to slightly higher average announcement returns in periods with elevated implied volatility, conditional on earnings, revenue and the other uncertainty proxies.

The interaction terms show that this pattern again runs through earnings. The earnings–VIX interactions are positive and precisely estimated at roughly 6.7, 4.8 and 7.4 bps per $+1\sigma$ increase in VIX(z) across the three windows, while the revenue–VIX interactions are small, between about -1.1 and -1.5 bps, and not statistically different from zero. This gives that a given positive earnings surprise is associated with a somewhat stronger abnormal return when VIX is high than when it is low, whereas the response to revenue surprises hardly changes across volatility states. This is the opposite of what H4 predicts, since H4 expects higher VIX to *weaken* the reaction to both earnings and revenue news.

The single-proxy VIX regressions in **Table A2** (reported in the appendix) help to interpret this result. When VIX and its interactions are estimated without EPU and BW sentiment, using the larger VIX sample, the earnings–VIX interaction becomes noticeably smaller and is only marginally significant in the widest $[-3, +3]$ window, and the revenue–VIX interaction remains close to zero in all cases. The Wald tests in **Table A2** do not reject the joint null that the VIX interaction coefficients are zero. Taken together, the joint model suggests positive earnings–VIX moderation effect, but this effect is not robust once VIX is analyzed on its own. There is therefore no consistent evidence that higher financial uncertainty dampens the announcement reaction to earnings or revenue surprises, and H4 cannot be supported.

H5 Economic policy uncertainty

Economic policy uncertainty, measured by the EPU index and standardized as EPU(z), gives much clearer evidence than VIX and lines up closer with H5. In **Table 3**, where EPU enters together with VIX and BW sentiment, the main effect of EPU(z) on CAR is small and negative: about -5.2 bps in $[-1, +1]$, -8.8 bps in $[0, +2]$ and close to zero in $[-3, +3]$. This points to slightly lower average announcement returns in periods of high policy uncertainty, conditional on earnings, revenue and the other uncertainty proxies.

The interaction terms show that the main effect again runs through earnings. The earnings–EPU interactions are clearly negative and precisely estimated at roughly -6.4 , -4.7 and -7.9 bps per $+1\sigma$ increase in EPU(z) across the three windows, while the revenue–EPU interactions are small, around 1.4–1.5 bps, and not statistically different from zero. Positive earnings surprises therefore leads to a much weaker abnormal return when EPU is high than when it is low, whereas the response to revenue surprises changes only modestly and is not estimated with high precision.

The joint Wald tests for the EPU interaction block reject the null that the earnings and revenue interactions are jointly equal to zero in all three windows, which confirms that policy uncertainty does affect announcement-period sensitivities and that this effect is mainly concentrated in earnings.

The single-proxy EPU regressions in **Table A3** (reported in the appendix) show that this pattern is not driven by the joint specification. When EPU and its interactions are estimated on their own, using the larger EPU sample, the earnings–EPU interactions remain negative and highly significant at about -3.9 , -3.3 and -4.3 bps per $+1\sigma$. The revenue–EPU interactions are positive, around 2.2 – 2.4 bps, but less precisely estimated. The Wald tests in **Table A3** reject both the joint null that the EPU interaction coefficients are zero and the equality null that the earnings and revenue interactions are the same.

Taken together, this provides strong support for the earnings part of H5: higher policy uncertainty systematically weakens the price reaction to earnings surprises. For revenue, the evidence is much weaker and does not allow a firm conclusion. The point estimates suggest that high EPU, if anything, may slightly strengthen the reaction to revenue surprises, but this effect is small and imprecisely measured. Overall, the results indicate that policy uncertainty mainly attenuates the earnings component of quarterly news, while leaving the revenue component largely unaffected and possibly somewhat more important in relative terms.

6.4 Results H6

The post-announcement regressions provide the formal tests for H6.

Table 4 relates post-announcement cumulative abnormal returns to earnings and revenue surprises, conditioning on the initial announcement-window reaction and including sector fixed effects with firm-clustered standard errors. The dependent variable is CAR $[+2, +20]$ and CAR $[+2, +60]$, expressed in basis points. Across both windows there is no sign of positive drift. For earnings surprises, the coefficient is close to zero and insignificant in $[+2, +20]$ around -1.7 bps, and clearly negative in $[+2, +60]$ about -14.2 bps. For revenue surprises the reversal is stronger, roughly -6.6 bps over $[+2, +20]$ and -22.4 bps over $[+2, +60]$. These estimates point to partial give-back of the initial reaction rather than continuation, with the effect particularly pronounced for revenue news.

The coefficient on CAR $[-1, +1]$ itself is positive and precisely estimated in both windows, which means that events with larger immediate moves tend to have slightly higher post-

period returns on average. Once this initial move is held fixed, however, the additional adjustment linked to earnings and revenue surprises is negative, not positive. Firm size loads negatively and significantly in both specifications, implying that larger firms give back more of the announcement reaction in the weeks and months that follow. The joint Wald tests $H_0: \beta_{EPS}^{post} = \beta_{Sales}^{post} = 0$ are rejected in both windows, and equality tests $H_0: \beta_{EPS}^{post} = \beta_{Sales}^{post}$ are rejected as well, so earnings and revenue differ in their post behavior, with revenue showing the stronger reversal. Taken together, **Table 4** indicates that, conditional on the announcement-window return, the post-announcement component of the reaction moves against the news rather than in its favor, which is not consistent with H6.

Table 4. Post-announcement drift conditional on announcement-window returns

	CAR [+2, +20] (bps)	CAR [+2, +60] (bps)
	(1)	(2)
Earnings surprise	-1.7 (1.2)	-14.2*** (2.2)
Revenue surprise	-6.6*** (1.5)	-22.4*** (2.9)
CAR [-1, +1]	0.0*** (0.0)	0.1*** (0.0)
Size (log)	-27.6*** (3.3)	-79.3*** (5.9)
N	42893	42893
Adj. R ²	0.006	0.013
Sector FE	Yes	Yes
SE clustering	Firm	Firm
H6a (joint post CAR [-1, +1]): $\beta_{EPS} = \beta_{Revenue} = 0$ (p-value)	< 0.0001	< 0.0001
H6b (relative post CAR [-1, +1]): $\beta_{EPS} = \beta_{Revenue}$ (p-value)	0.0212	0.0412

Table 5 reports the joint post-announcement moderation regressions for VIX, EPU and BW sentiment for CAR [+2, +20] and CAR [+2, +60]. Conditional on CAR [-1, +1], the coefficients on earnings and revenue surprises are negative in both windows. Earnings surprises are linked to about -2 to -16 bps of post-announcement return and revenue surprises to about -8 to -24 bps, confirming that the main pattern is reversal of the announcement reaction rather than continuation. The coefficient on CAR [-1, +1] itself is around 0.1 bps per bps and highly significant in both columns, so events with larger initial moves tend to have slightly higher post-window returns, but after controlling for this, additional adjustment associated with the surprises is negative. Firm size loads strongly negative, indicating that larger firms give back more of the initial reaction in the weeks after the announcement.

The uncertainty indices mainly shift the average level of post-announcement returns rather than the link between surprises and returns. VIX(z) is weak in the short window and only mildly positive in [+2, +60], while EPU(z) and BW(z) enter with sizeable positive coefficients in both windows, pointing to higher average post-announcement returns in periods of high policy uncertainty and high sentiment. The interaction block shows that post-announcement moderation is limited and concentrated in the shorter window. Some earnings–uncertainty and revenue–uncertainty interactions are statistically significant in CAR [+2, +20], but they are small in magnitude and often lose significance in CAR [+2, +60]. The Wald tests on the post-interaction terms confirm this pattern. For [+2, +20], the joint null that all earnings–uncertainty interactions are zero is rejected, as is the corresponding joint null for all revenue–uncertainty interactions and for all six interactions together, whereas in [+2, +60] only the joint test on all interactions is rejected. Combined with the negative baseline coefficients on earnings and revenue surprises, this indicates that uncertainty modifies the strength of the post-announcement reversal rather than generating positive drift in the direction of the news.

Table 5. Joint post-announcement moderation by VIX, EPU and BW sentiment (conditional on announcement-window returns)

	CAR [+2, +20] (bps)	CAR [+2, +60] (bps)
	(1)	(2)
Earnings surprise	-2.2* (1.3)	-15.5*** (2.5)
Revenue surprise	-7.6*** (1.7)	-24.3*** (3.2)
VIX (z)	-12.7* (6.9)	4.3 (11.1)
EPU (z)	21.8*** (6.3)	56.4*** (12.3)
BW sentiment (z)	30.8*** (3.8)	33.1*** (6.6)
Earnings surprise $\times$ VIX(z)	3.4 (2.8)	-1.0 (4.4)
Revenue surprise $\times$ VIX(z)	9.1*** (3.3)	-1.2 (6.1)
Earnings surprise $\times$ EPU(z)	-4.3** (2.1)	-5.9 (3.7)
Revenue surprise $\times$ EPU(z)	-2.6 (2.3)	-7.8* (4.2)
Earnings surprise $\times$ BW(z)	-2.7** (1.2)	-1.7 (2.2)
Revenue surprise $\times$ BW(z)	-0.9 (1.5)	0.1 (2.5)
CAR [-1, +1]	0.1*** (0.0)	0.1*** (0.0)
Size (log)	-34.2*** (3.5)	-85.4*** (6.4)
N	39392	39392
Adj. R ²	0.010	0.015
Sector FE	Yes	Yes
SE clustering	Firm	Firm
VIX post-interactions (EPS & Revenue) = 0 (p-value)	0.0022	0.9315
EPU post-interactions (EPS & Revenue) = 0 (p-value)	0.0172	0.0156
BW post-interactions (EPS & Revenue) = 0 (p-value)	0.0353	0.7073
Joint EPS post-interactions (VIX/EPU/BW): $\delta_{\text{EPS}} = 0$ (p-value)	0.0428	0.2004
Joint Revenue post-interactions (VIX/EPU/BW): $\delta_{\text{Revenue}} = 0$ (p-value)	0.0478	0.2150
All post-interactions: $\delta_{\text{EPS}} = \delta_{\text{Revenue}} = 0$ (p-value)	0.0041	0.0242

H6 Investor sentiment

Investor sentiment, measured by the Baker–Wurgler index and standardized as $BW(z)$, does not support H6. In the joint post-announcement regressions of **Table 5**, $BW(z)$ has a large positive main effect: post-announcement returns are roughly +30.8 bps in $[+2, +20]$ and +33.1 bps in $[+2, +60]$ higher when sentiment is one standard deviation above its mean, conditional on earnings, revenue, CAR $[-1, +1]$ and the other uncertainty proxies. The earnings– BW interactions are modestly negative (about -2.7 and -1.7 bps), and the revenue– BW interactions are near zero and insignificant. Wald tests show that BW -related interactions are jointly different from zero only in the short window, but given the small magnitudes and the negative baseline post coefficients, BW mainly shifts the overall level of post-announcement returns rather than generating drift after good or bad news. High sentiment is therefore associated with higher, not lower, follow-up returns, which runs counter to H6.

H6 Financial uncertainty

Financial uncertainty, proxied by the VIX index and standardized as $VIX(z)$, provides only limited support for H6. In the joint specification of **Table 5**, the main $VIX(z)$ effect is -12.7 bps in $[+2, +20]$ and close to zero in $[+2, +60]$, suggesting little systematic impact on average post-announcement returns once CAR $[-1, +1]$ and the news are controlled for. The earnings– VIX interactions are small and insignificant, while the revenue– VIX interaction is positive and significant in $[+2, +20]$ (around +9.1 bps per $+1\sigma$) and negligible in $[+2, +60]$. This implies that high VIX partly offsets the short-horizon reversal in revenue news but has no lasting effect over the longer window. The single-proxy VIX regressions in **Table A4** show a similar pattern: a positive and significant revenue– VIX interaction only in $[+2, +20]$, with weak evidence elsewhere. Overall, elevated volatility slightly weakens short-run reversal in revenue surprises but does not produce robust drift in the direction of the news, so financial uncertainty offers at best temporary and modest support for H6.

H6 Economic policy uncertainty

Economic policy uncertainty, measured by the EPU index and standardized as $EPU(z)$, also gives little support for H6. In the joint post-announcement regressions of **Table 5**, $EPU(z)$ has a strongly positive main effect, with coefficients of about +21.8 bps in $[+2, +20]$ and +56.4 bps in $[+2, +60]$, indicating higher average post-announcement returns in high-EPU periods, conditional on CAR $[-1, +1]$, earnings, revenue and the other proxies. At the same time, the earnings– EPU interactions are clearly negative (around -4.3 and -5.9 bps), and the revenue–

EPU interactions are also negative (about -2.6 and -7.8 bps), which strengthens the reversal in both series rather than creating continuation; the EPU interaction block is jointly significant in both windows. In the single-proxy EPU regressions in **Table A6**, the main EPU effect remains positive, but the interaction terms are small, imprecise and not jointly different from zero. Taken together, the evidence points to higher average post-announcement returns when policy uncertainty is high, but reversal remains at least as strong, so there is no robust sign that EPU generates post-announcement drift in the direction of earnings or revenue surprises, contrary to H6.

7. Conclusion, Limitations and Future Research

7.1 Conclusion

The results show that quarterly earnings and revenue surprises are clearly reflected in stock prices around the announcement date. For H1 and H2, both types of surprises are positively related to cumulative abnormal returns in short event windows, which fits the idea that better-than-expected news is rewarded and worse-than-expected news is penalized. Earnings surprises have a consistently larger impact than revenue surprises, although both matter for the price adjustment. This points to fast incorporation of accounting news, with most of the reaction concentrated in a narrow window around the release.

The uncertainty results are based on a joint specification in which financial uncertainty (VIX), economic policy uncertainty (EPU) and investor sentiment (Baker–Wurgler) and their interactions with earnings and revenue surprises enter simultaneously. This joint model is complemented by single-proxy regressions for robustness, but the interpretation of H3–H5 is anchored in the joint specification.

For H3, the sentiment results indicate that the Baker–Wurgler index mainly changes how strongly earnings news is priced, while the effect on revenue surprises is limited. In the joint model, higher sentiment is associated with weaker announcement-window reactions to earnings surprises, whereas the earnings coefficients are stronger when sentiment is lower. One way to read this is that in “hotter” markets, where valuations and mood are already high, investors lean more on broad narratives and are less sensitive to additional firm-specific

earnings details. In more neutral or cautious regimes, earnings announcements stand out more and elicit sharper price moves. Since H3 predicts the opposite, the evidence goes against H3.

For H4, the findings for financial uncertainty, measured by implied volatility, do not point to a stable change in the sensitivity of announcement returns to earnings or revenue surprises. In the joint model, some earnings–VIX interactions show up as positive, but this pattern weakens and becomes unstable when VIX is analyzed on its own in the larger single-proxy sample. Across specifications, the core earnings and revenue coefficients remain very similar, and the Wald tests provide little support for a systematic moderating role of VIX. This suggests that, within the range of volatility observed in the sample, investors treat short-run market volatility more as background risk than as a state variable that changes how they process firm-specific earnings news. H4 is therefore rejected

For H5, economic policy uncertainty appears to matter more. In the joint model, higher values of the policy uncertainty index are associated with a weaker link between earnings surprises and announcement-period returns, while the link between revenue surprises and returns becomes somewhat stronger. The earnings–EPU interactions are negative and precisely estimated, both in the joint specification and in the single-proxy EPU regressions, which provides robust evidence that high policy uncertainty dampens the reaction to earnings news. The revenue–EPU interactions are positive but smaller and estimated with less precision, so the revenue side of H5 is only weakly supported. A plausible interpretation is that when the policy outlook is unclear, investors are more cautious about accrual-based earnings, which are sensitive to taxes, regulation and macro conditions, and place relatively more weight on revenue surprises as a more direct signal of underlying demand that is less affected by accounting choices.

H6 shifts the focus from the announcement window to the period after the release. The estimates do not support a positive post-earnings-announcement drift. Instead, announcement-period reactions tend to reverse over the following days and weeks, with this reversal stronger for revenue surprises and for longer post windows. This points to partial give-back of the initial move rather than continuation in the direction of the news. Uncertainty states play at most a limited role in this timing dimension: they slightly change the strength of the reversal in some cases, but they do not overturn the general pattern that post-announcement returns move against the initial reaction rather than extending it.

7.2 Limitations

The empirical design in this study follows established practice, but several limitations should be acknowledged when interpreting the results. These limitations mainly concern the composition of the sample, the construction of the main variables, the measurement of uncertainty, and the econometric specification.

First, the evidence is based on listed firms that are members of the S&P 500 at the time of the earnings announcement. This focus helps to ensure liquid trading, broad analyst coverage and relatively reliable data, but it narrows the scope of the conclusions. The results are most relevant for large, mature US firms and may not generalize to smaller companies, firms in other indices or markets with different trading frictions and disclosure practices. In addition, the requirement of sufficient analyst coverage for both earnings and revenue surprises removes several observations from the initial sample. As a result, the analysis effectively concentrates on events for which information is already relatively rich, which may dampen patterns that are stronger in thinner segments of the market. Firms that remain in the index for a long time also contribute more announcements than firms that enter or leave more quickly, so long-lived constituents naturally carry more weight in the regressions.

Second, the event-study framework relies on daily returns and a standard market model to estimate abnormal performance around earnings announcements. This approach is widely used in capital market research, yet it has its own restrictions. The reliance on daily data means that intraday adjustment and very short-lived price reactions are not observed. The selected return windows inevitably include days that may contain other firm-specific or macroeconomic news, which cannot be fully separated from the earnings announcement effect. The estimation of normal returns draws on historical windows that can span different market conditions, and a fallback procedure is used when the preferred amount of data is not available. This stabilizes the abnormal return calculations but also adds estimation noise. Furthermore, extreme observations in cumulative abnormal returns and in the main continuous regressors are winsorized at the one-percent tails. This reduces the influence of outliers and makes the regression estimates more robust, but it also truncates very large announcement reactions and may understate the extent of rare but substantial mispricing.

Third, the construction of earnings and revenue surprises is subject to several practical constraints. Surprises are based on analyst consensus forecasts from FactSet, with a minimum of two analysts required for both earnings and revenue. On average coverage is high, which supports the reliability of the consensus, but it also means that announcements for firms or periods with very sparse coverage are removed. The standardization of surprises by the cross-sectional dispersion of forecasts follows common practice, yet this dispersion itself is an imperfect measure of uncertainty and is influenced by the number and behavior of forecasters. Forecasts may also be stale if not all analysts update in the period directly before the announcement. These features introduce measurement error in the surprise variables, particularly for revenue, where coverage is often less uniform than for earnings. In that sense, the relative strength and precision of the earnings and revenue coefficients reflect not only economic content but also differences in forecast quality and availability.

Fourth, the measures of uncertainty capture broad market conditions rather than firm-specific risk. Implied volatility and the daily US economic policy uncertainty index are matched to the date of the announcement using a calendar that fills non-trading days with the most recent available value. This provides a high-frequency measure of financial and policy uncertainty at the cost of smoothing over very short-lived changes between trading days. The Baker and Wurgler sentiment index is only available at a monthly frequency and is therefore assigned at the month level, so all announcements within the same month share the same sentiment estimate. This coarse timing may mask within-month changes in conditions and likely introduces noise in the interaction terms, which can bias moderating effects toward zero. Moreover, all three indicators are aggregate measures that reflect general financial, macroeconomic and behavioral conditions rather than firm-level uncertainty. If investors react mainly to uncertainty that is specific to the sector or the individual firm, the proxies used here only partly capture the relevant environment.

Fifth, the econometric specification is associative rather than causal. The regressions use linear models with sector fixed effects and a small set of firm-level controls, and standard errors are clustered at the firm level to allow for dependence within firms over time. This helps to account for some unobserved heterogeneity and serial correlation, but it does not remove all potential confounding influences. Shocks that affect many firms on the same day or within the same sector, as well as changes in macroeconomic policy, risk appetite or liquidity, may still be reflected in the error terms. The measures of uncertainty are themselves

outcomes of the same economic environment in which firms operate. They are not randomly assigned, and they may respond to news that is correlated with both earnings surprises and returns. The estimated relations between uncertainty and announcement reactions should therefore be interpreted as conditional associations, not as evidence that changes in volatility, policy uncertainty or sentiment mechanically cause changes in the earnings–return relation. In addition, the joint specification that includes VIX, EPU and sentiment in one regression is estimated on a smaller common sample and involves highly correlated proxies. This improves comparability across uncertainty channels, but it also reduces effective sample size and makes it harder to separate their individual contributions. The single-proxy specifications, estimated on larger samples, partly address this trade-off but do not fully resolve these identification limits.

Finally, the analysis of post-announcement behavior in H6 is restricted to windows that extend up to sixty trading days after the event. This horizon captures short- and medium-run adjustment but does not provide information on longer-run dynamics. The post-announcement return windows can also overlap with subsequent earnings announcements, guidance revisions, macroeconomic releases and other firm-specific events. The observed reversal of announcement-period reactions should therefore be viewed as a net outcome of several forces rather than a pure correction of initial mispricing. The evidence on drift and reversal complements the announcement-window findings, but it remains subject to the same data and design constraints that apply to the rest of the study.

7.3 Future Research

The findings suggest several avenues for further research on how markets process earnings information under uncertainty. A first step would be to extend the analysis to other market segments and settings. The present evidence is drawn from large, well followed US firms, which are likely to differ from smaller companies and firms in other countries in terms of liquidity, disclosure practice and analyst coverage. Applying a similar framework to small cap indices, non-US markets or cross-country samples would help to assess whether the strong announcement reactions, the limited role of financial volatility and the asymmetric moderating effects of policy uncertainty and sentiment also appear in environments with different trading frictions and institutional features.

Further work could also refine the measurement of uncertainty and investor sentiment. The indicators used here capture broad market and policy conditions and are, by construction, aggregate measures. Future research may explore sector level and firm specific proxies, for example based on the information content of regulatory filings, conference call language or news tone, and link these more directly to earnings announcements. It would also be useful to examine non linearities and regime dependence, such as whether the moderating effects of uncertainty become stronger in periods of extremely high volatility or exceptionally optimistic or pessimistic sentiment.

Another direction is to strengthen identification of the link between uncertainty and announcement reactions. The empirical approach in this study documents conditional associations, but uncertainty measures are themselves shaped by the economic environment. Designs that exploit exogenous shifts in policy or macro uncertainty, or that focus on specific policy events that change uncertainty while leaving fundamentals largely unaffected, could provide a tighter view on causality. Panel models with richer sets of firm and time fixed effects, or high frequency studies around well-defined uncertainty shocks, may further help to separate the effect of uncertainty from other time varying factors.

Finally, future research may dig deeper into the mechanisms behind the differences between earnings and revenue surprises and the reversal observed after announcements. One possibility is to decompose earnings into cash flow and accrual components and to examine whether policy uncertainty and sentiment are especially important for the pricing of accrual heavy news. Another is to incorporate guidance, concurrent news and measures of trading activity and liquidity around the announcement to understand whether post announcement reversal is driven mainly by initial overreaction, by inventory and liquidity effects or by the arrival of new information. Such extensions would complement the current evidence by clarifying how different dimensions of uncertainty interact with more detailed aspects of the earnings process and trading behavior.

8. Appendix

Appendix **Table A1** compares the baseline H1–H2 specification for CAR $[-1, +1]$ with an augmented version that adds the three uncertainty proxies VIX(z), EPU(z) and BW sentiment (z) as additional controls. Both models are estimated on the common H1–H2 sample with firm-clustered standard errors and sector fixed effects. The coefficients on SUE and SUR remain very similar across the two columns (around 47 bps and 27 bps, respectively), and the adjusted R^2 increases only marginally. By contrast, the uncertainty proxies load significantly, which indicates that they mainly shift the average level of announcement-window returns rather than the sensitivity to earnings and revenue news. This confirms that the baseline H1–H2 results are not driven by omitted variation in financial, policy or sentiment conditions.

Appendix Table A1. Robustness of H1-H2 to adding uncertainty controls

	Baseline	With uncertainty controls
	CAR $[-1, +1]$	CAR $[-1, +1]$
	(1)	(2)
EPS surprise	46.7*** (1.9)	47.0*** (1.9)
Revenue surprise	26.1*** (1.7)	26.8*** (1.7)
VIX (z)		17.1*** (4.6)
EPU (z)		-12.4*** (4.2)
BW Sentiment (z)		-21.4*** (2.9)
Size (log)	2.9 (3.0)	8.7*** (3.0)
N	39392	39392
Adj. R^2	0.072	0.074
SE Clustering	Firm	Firm
Sector FE	Yes	Yes

Appendix **Table A2** reports single-proxy moderation regressions where VIX(z) and its interactions are added to the baseline H1–H2 specification. The coefficients on earnings and revenue surprises stay very close to the main results (around 43–46 bps for earnings and 26–28 bps for revenue), while the main effect of VIX(z) is modestly positive. The earnings–VIX interaction is small and only marginally significant in the widest [−3, +3] window, and the revenue–VIX interaction is close to zero in all cases. The Wald tests at the bottom show that the two VIX interaction terms are not jointly different from zero and that their effects cannot be statistically distinguished from each other. Overall, Appendix **Table A2** suggests that financial uncertainty, taken on its own, does not systematically change the announcement-window sensitivity to earnings and revenue news.

Appendix table A2. VIX and moderation of announcement-window abnormal returns			
	CAR [−1, +1] (bps)	CAR [0, +2] (bps)	CAR [−3, +3] (bps)
	(1)	(2)	(3)
Earnings surprise	45.9*** (1.8)	43.0*** (1.7)	44.5*** (1.8)
Revenue surprise	27.7*** (1.7)	26.2*** (1.6)	26.9*** (1.7)
VIX (z)	8.7* (4.7)	7.8** (3.7)	5.0 (4.0)
Earnings surprise × VIX(z)	3.1 (2.0)	2.2 (1.5)	3.3* (1.7)
Revenue surprise × VIX(z)	-0.9 (2.1)	-0.8 (1.6)	-1.0 (1.7)
Size (log)	3.9 (2.9)	3.4 (2.8)	2.5 (2.8)
N	42876	42876	42876
Adj. R ²	0.072	0.075	0.068
Sector FE	Yes	Yes	Yes
SE clustering	Firm	Firm	Firm
VIX moderation: $\delta_EPS = \delta_Revenue = 0$	0.2692	0.3182	0.1601
Equal moderation: $\delta_EPS = \delta_Revenue = 0$	0.2217	0.2331	0.1326

Appendix **Table A3** presents the analogous single-proxy moderation regressions for economic policy uncertainty, using EPU(z) and its interactions with earnings and revenue surprises. Again, the baseline earnings and revenue coefficients remain very similar to those in the main H1–H2 table. The main effect of EPU(z) on CAR is mildly negative, while the earnings–EPU interactions are clearly negative and highly significant across all three windows. The revenue–EPU interactions are positive, around 2–2.4 bps, but imprecisely estimated. The Wald tests indicate that the EPU interaction terms are jointly different from zero and that the earnings and revenue interactions are significantly different from each other. Taken together, Appendix **Table A3** supports the conclusion that high policy uncertainty systematically weakens the price reaction to earnings surprises, while any strengthening of the revenue response is small and less precisely identified.

Appendix table A3. EPU and moderation of announcement-window abnormal returns			
	CAR [−1, +1] (bps)	CAR [0, +2] (bps)	CAR [−3, +3] (bps)
	(1)	(2)	(3)
Earnings surprise	45.7*** (1.8)	42.8*** (1.7)	44.3*** (1.7)
Revenue surprise	28.1*** (1.7)	26.5*** (1.6)	27.3*** (1.7)
EPU (z)	−4.1 (3.6)	−5.0 (3.3)	−2.4 (3.7)
Earnings surprise × EPU(z)	−3.9*** (1.3)	−3.3*** (1.1)	−4.3*** (1.3)
Revenue surprise × EPU(z)	2.4 (1.6)	2.3 (1.5)	2.2 (1.6)
Size (log)	3.3 (3.0)	2.9 (2.8)	2.2 (2.9)
N	42876	42876	42876
Adj. R ²	0.072	0.075	0.068
Sector FE	Yes	Yes	Yes
SE clustering	Firm	Firm	Firm
EPU moderation: $\delta_EPS = \delta_Revenue = 0$ (p-value)	0.0054	0.0085	0.0030
Equal moderation: $\delta_EPS = \delta_Revenue$ (p-value)	0.0045	0.0066	0.0048

Appendix **Table A4** reports the single-proxy post-announcement regressions with VIX as the only uncertainty measure. The baseline earnings and revenue coefficients are very similar to **Table 5** and again show clear reversal in both post windows. VIX itself is insignificant in [+2, +20] and positive in [+2, +60], while only the revenue–VIX interaction in the short window remains noticeably positive and significant; the other interaction terms are small and imprecise. The Wald tests confirm that VIX-related moderation is only jointly significant for [+2, +20], so any weakening of the revenue reversal is short-lived.

Appendix table A4. Post-announcement moderation by VIX		
	CAR [+2, +20] (bps)	CAR [+2, +60] (bps)
	(1)	(2)
Earnings surprise	-1.7 (1.3)	-14.0*** (2.3)
Revenue surprise	-6.5*** (1.6)	-22.4*** (3.0)
VIX (z)	-5.8 (6.0)	23.7** (9.4)
Earnings surprise × VIX(z)	1.7 (2.4)	-2.7 (3.9)
Revenue surprise × VIX(z)	8.0*** (3.0)	-3.6 (5.5)
CAR [-1, +1]	0.0*** (0.0)	0.1*** (0.0)
Size (log)	-28.4*** (3.1)	-77.0*** (5.7)
N	42893	42893
Adj. R ²	0.007	0.014
Sector FE	Yes	Yes
SE clustering	Firm	Firm
VIX post-mod: $\delta_{\text{EPS}} = \delta_{\text{Revenue}} = 0$ (p-value)	0.0055	0.4292
Equal moderation post: $\delta_{\text{EPS}} = \delta_{\text{Revenue}}$ (p-value)	0.1545	0.9142

Appendix **Table A5** shows the corresponding post-announcement regressions with EPU as the only proxy. As in **Table 5**, EPU has a positive and significant main effect in both windows, indicating higher average post-announcement returns when policy uncertainty is high. However, the earnings–EPU and revenue–EPU interaction terms are small, mostly insignificant and not jointly different from zero, and the equality tests between them are also not rejected. This suggests that, once other proxies are removed, EPU mainly shifts the level of post-announcement returns without materially changing the strength of the reversal in earnings or revenue surprises.

Appendix table A5. Post-announcement moderation by EPU

	CAR [+2, +20] (bps)	CAR [+2, +60] (bps)
	(1)	(2)
Earnings surprise	-1.8 (1.2)	-14.1*** (2.2)
Revenue surprise	-6.5*** (1.6)	-22.8*** (3.0)
EPU (z)	9.4** (4.5)	36.2*** (8.3)
Earnings surprise × EPU(z)	-1.1 (1.4)	-2.9 (2.6)
Revenue surprise × EPU(z)	2.0 (1.8)	-4.7 (3.3)
CAR [-1, +1]	0.1*** (0.0)	0.1*** (0.0)
Size (log)	-28.2*** (3.3)	-80.4*** (6.0)
N	42893	42893
Adj. R ²	0.006	0.014
Sector FE	Yes	Yes
SE clustering	Firm	Firm
EPU post-mod: $\delta_EPS = \delta_Revenue = 0$ (p-value)	0.5167	0.0659
Equal moderation post: $\delta_EPS = \delta_Revenue$ (p-value)	0.2619	0.7269

9. References

- Baker, M., & Wurgler, J. (2006). Investor sentiment and the cross-section of stock returns. *Journal of Finance*, 61(4), 1645–1680.
- Baker, M., & Wurgler, J. (2007). Investor sentiment in the stock market. *Journal of Economic Perspectives*, 21(2), 129–151.
- Baker, S. R., Bloom, N., & Davis, S. J. (2016). Measuring economic policy uncertainty. *Quarterly Journal of Economics*, 131(4), 1593–1636.
- Ball, R., & Brown, P. (1968). An empirical evaluation of accounting income numbers. *Journal of Accounting Research*, 6(2), 159–178.
- Barberis, N., Shleifer, A., & Vishny, R. (1998). A model of investor sentiment. *Journal of Financial Economics*, 49(3), 307–343.
- Bekaert, G., & Hoerova, M. (2014). The VIX, the variance premium and stock market volatility. *Journal of Econometrics*, 183(2), 181–192.
- Beaver, W. H. (1968). The information content of annual earnings announcements. *Journal of Accounting Research*, 6, 67–92.
- Beaver, W. H., McNichols, M. F., & Wang, Z. Z. (2020). Increased market response to earnings announcements in the 21st century: An empirical investigation. *Journal of Accounting and Economics*, 69, Article 101244.
- Bernard, V. L., & Thomas, J. K. (1989). Post-earnings-announcement drift: Delayed price response or risk premium? *Journal of Accounting Research*, 27(Supplement), 1–36.
- Bird, R., Choi, D. F. S., & Yeung, D. (2014). Market uncertainty, market sentiment, and the post-earnings announcement drift. *Review of Quantitative Finance and Accounting*, 43, 45–73.
- Bloom, N. (2009). The impact of uncertainty shocks. *Econometrica*, 77(3), 623–685.
- Bollerslev, T., Tauchen, G., & Zhou, H. (2009). Expected stock returns and variance risk premia. *Review of Financial Studies*, 22(11), 4463–4492.
- Bossmann, A., Gubareva, M., & Teplova, T. (2023). Economic policy uncertainty, geopolitical risk, market sentiment, and regional stocks: Asymmetric analyses of the EU sectors. *Eurasian Economic Review*, 13, 321–372.
- Brogaard, J., & Detzel, A. (2015). The asset-pricing implications of government economic policy uncertainty. *Management Science*, 61(1), 3–18.
- Da, Z., Engelberg, J., & Gao, P. (2015). The sum of all FEARS: Investor sentiment and asset prices. *Review of Financial Studies*, 28(1), 1–32.
- de Haan, E., Shevlin, T., & Thornock, J. (2015). Market (in)attention and the strategic scheduling and timing of earnings announcements. *Journal of Accounting and Economics*, 60(1), 36–55.
- De Long, J. B., Shleifer, A., Summers, L. H., & Waldmann, R. J. (1990). Noise trader risk in financial markets. *Journal of Political Economy*, 98(4), 703–738.
- Diebold, F. X., & Yilmaz, K. (2012). Better to give than to receive: Predictive directional measurement of volatility spillovers. *International Journal of Forecasting*, 28(1), 57–66.
- Du, X., Ao, Z., Chai, Y., & Ge, S. (2023). Economic policy uncertainty, investor attention and post-earnings announcement drift. *International Review of Financial Analysis*, 87, Article 102615.

- Ertimur, Y., Livnat, J., & Martikainen, M. (2003). Differential market reactions to revenue and expense surprises. *Review of Accounting Studies*, 8, 185–211.
- Foster, G., Olsen, C., & Shevlin, T. (1984). Earnings releases, anomalies, and the behavior of security returns. *The Accounting Review*, 59(4), 574–603.
- Gulen, H., & Ion, M. (2016). Policy uncertainty and corporate investment. *Review of Financial Studies*, 29(3), 523–564.
- Jegadeesh, N., & Livnat, J. (2006). Revenue surprises and stock returns. *Journal of Accounting and Economics*, 41, 147–171.
- Kama, I. (2009). On the market reaction to revenue and earnings surprises. *Journal of Business Finance & Accounting*, 36(1–2), 31–50.
- Kim, O., & Verrecchia, R. E. (1997). Pre-announcement and event-period private information. *Journal of Accounting and Economics*, 24(3), 395–419.
- Nagar, V., Schoenfeld, J., & Wellman, L. (2019). The effect of economic policy uncertainty on investor information asymmetry and management disclosures. *Journal of Accounting and Economics*, 67(1), 36–57.
- Nartea, G. V., Bai, H., & Wu, J. (2020). Investor sentiment and the economic policy uncertainty premium. *Pacific-Basin Finance Journal*, 64, Article 101438.
- Pástor, L., & Veronesi, P. (2012). Uncertainty about government policy and stock prices. *Journal of Finance*, 67(4), 1219–1264.
- Savor, P., & Wilson, M. (2016). Earnings announcements and systematic risk. *Journal of Finance*, 71(1), 83–136.
- Stambaugh, R. F., Yu, J., & Yuan, Y. (2012). The short of it: Investor sentiment and anomalies. *Journal of Financial Economics*, 104(2), 288–302.
- Veronesi, P. (1999). Stock market overreaction to bad news in good times: A rational expectations equilibrium model. *Review of Financial Studies*, 12(5), 975–1007.
- Watts, R. L. (1978). Systematic “abnormal” returns after quarterly earnings announcements. *Journal of Financial Economics*, 6, 127–150.
- Whaley, R. E. (2000). The investor fear gauge. *Journal of Portfolio Management*, 26(3), 12–17.
- Wu, J. (2022). Economic policy uncertainty, investor sentiment, and stock price synchronisation: Evidence from China. *Mathematical Problems in Engineering*, 2022, Article 7830668.
- Zhang, X. F. (2006). Information uncertainty and stock returns. *Journal of Finance*, 61(1), 105–137.