

Bound by Debt or Driven by the Market?

A study on the effect of acquirer risk exposure on acquisition premiums
in public-to-public M&A transactions from 2000-2025

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Abstract

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Key Words: M&A, Acquisition Premium, Leverage, Stock Return Volatility, Free Cash Flow

Purpose: To examine whether an acquirer's risk exposure affects the acquisition premium paid in public-to-public M&A transactions, specifically isolating the effects of leverage and stock return volatility alongside the moderating role of free cash flow.

Methodology: The study employs multivariate OLS regressions with year and industry fixed effects and heteroskedasticity-robust standard errors to examine how leverage, stock return volatility, and free cash flow interactions relate to 4-week pre-announcement acquisition premiums. Robustness tests assess result sensitivity.

Theoretical perspectives: The framework uses agency theory, the free cash flow hypothesis, the hubris hypothesis, and the information asymmetry framework.

Empirical foundation: The study is based on 1,654 completed public-to-public M&A transactions involving US targets, announced between 2000 and 2025.

Conclusion: Baseline regressions show no statistically significant relationship between leverage or volatility and the premium, suggesting that external governance and market conditions neutralise firm-specific risk. However, the interaction model indicates a significant debt disciplining effect, but only among cash-poor acquirers. Overall, risk exposure does not seem to drive the acquisition premium. Instead, debt constrains bidding behaviour only when internal resources are limited.

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1. Introduction

This chapter presents the study's background and the problem discussion for the chosen subject area. In addition, the study's purpose and research question are introduced. Finally, the study's contributions, findings, and outline are presented.

1.1 Background

In January 2022, Microsoft announced its plans to acquire Activision Blizzard for \$95 per share in an all-cash transaction valued at \$68.8 billion (Microsoft, 2022). The offer included an acquisition premium of approximately 45% over the target's pre-announcement share price as of January 14, 2022 (Activision Blizzard, 2022). The decision to pay this high premium for one of the world's largest gaming companies immediately raised a fundamental question: what motivated Microsoft to pay such a significant premium? Was it rational synergy explanations, management overconfidence, or the fact that Microsoft held \$125.4 billion in cash, cash equivalents, and short-term investments at the time (Microsoft Corporation, 2022)?

While Microsoft's bid represents an example of financial discretion, it highlights a broader, more fundamental reality. Mergers and acquisitions remain among the most important financial decisions a firm can make. In the United States alone, the total value of M&A deals over the past two decades has exceeded \$2 trillion in several years, and the pricing of these transactions has direct implications for the wealth of shareholders on both sides of the deal (Moeller et al., 2004). An important part of any transaction is the premium paid by the acquirer firm over the target's pre-announcement market price, which typically ranges from 30% to 50% of the target's pre-bid share price (Laamanen, 2007). Acquisition premiums are among the largest discretionary wealth transfers in corporate finance, and understanding what determines their size is therefore of great interest to both academics and practitioners.

The determinants of acquisition premiums have been studied extensively since the early empirical work of Walkling and Edmister (1985) and the theoretical contributions of Roll (1986) and Jensen (1986). The literature has identified a wide range of factors that influence the

premium, including target characteristics such as pre-bid performance and ownership structure, deal-level features such as payment method and the presence of competing bidders, and behavioural characteristics of acquiring managers. However, relatively little attention has been paid to how the acquirer's own risk exposure affects the premium paid. This thesis addresses this deficiency by examining whether an acquirer's risk exposure, measured through financial risk (leverage), market risk (stock return volatility), and managerial discretion (free cash flow), is significantly associated with the acquisition premium paid in mergers and acquisitions between publicly traded companies.

1.2 Problem Discussion

The research question in this study is motivated by competing theoretical predictions about the relationship between acquirer risk exposure and bidding behaviour. On the one hand, agency theory predicts that managers in firms with higher financial risk may have incentives to overbid for targets. Jensen and Meckling (1976) argue that highly leveraged firms face incentives to engage in asset substitution, in which shareholders benefit from making risky investments at the expense of debt holders. In the context of mergers and acquisitions, this means that highly leveraged acquirers may be willing to pay unreasonably high premiums, since much of the downside risk is borne by debt holders while equity holders retain most of the potential upside from the acquisition. Similarly, the hubris hypothesis (Roll, 1986) suggests that managers operating in more volatile markets may exhibit greater overconfidence in their valuation abilities, which increases the premiums they are willing to pay. The information asymmetry framework (Myers & Majluf, 1984) further implies that acquirers with higher stock return volatility are more difficult for outside investors to value accurately, which may lead target shareholders to demand higher premiums to compensate for uncertainty about the acquirer's true value.

On the other hand, leverage can also have a disciplining effect. Jensen (1986) argues that debt reduces the free cash flow available for acquisitions, and Lang et al. (1991) show that high leverage reduces acquirers' tendency to overpay for targets. In this sense, leverage serves as a governance mechanism that compensates for weak shareholder oversight by allocating a larger

share of the firm's cash flows to debt payments, thereby limiting the resources available for value-destroying acquisitions.

Since theory does not provide a clear prediction, the direction and strength of the relationship between acquirer risk exposure and acquisition premiums are ultimately empirical questions. The existing empirical evidence is limited and points in different directions depending on the sample, period and specification used. Previous studies have mainly focused on target characteristics (Walkling & Edmister, 1985), CEO-level behavioural attributes such as hubris and overconfidence (Hayward & Hambrick, 1997; Malmendier & Tate, 2008), or aggregate market conditions (Simonyan, 2014). To our knowledge, no prior study has jointly examined acquirer leverage and stock return volatility as proxy measures of risk within a single empirical framework. This thesis directly addresses that gap.

From a practical perspective, understanding this relationship is relevant to several stakeholders. Shareholders and boards of target companies benefit from knowing how acquirer characteristics affect the suitability of a bid when evaluating whether to accept or reject an offer. Acquirer shareholders benefit from understanding whether management is disciplined by the firm's financial characteristics when pursuing growth through acquisitions, or whether premiums paid simply reflect management's judgment. For regulators and corporate governance bodies, understanding how risk exposure shapes bidding behaviour can inform the design of mechanisms that limit value-destroying acquisitions.

1.3 Purpose, Contribution, and Findings

The purpose of this thesis is to examine the relationship between an acquirer's risk exposure and the acquisition premium paid in public-to-public transactions, testing whether leverage and stock return volatility work as predicted by the competing theoretical frameworks outlined above. As an extension, free cash flow is introduced as an additional explanatory variable in a second-stage specification to examine its potential role as the underlying mechanism driving these relationships. The study aims to examine the following research question:

Does acquirer risk exposure, measured by financial risk (leverage) and market risk (stock return volatility), affect the acquisition premium, and does the level of managerial discretion (free cash flow) moderate these relationships?

1.4 Outline

The rest of the thesis is structured as follows. Section 2 reviews the theoretical frameworks and empirical literature on the determinants of acquisition premiums and develops the testable hypotheses. Section 3 presents the data, sample construction and descriptive statistics. Section 4 describes the empirical methodology, including the regression specification and variable definitions. Section 5 reports the regression results. Section 6 concludes by discussing implications, limitations, and the potential for future research.

2. Literature Review and Hypothesis Development

This chapter reviews the theoretical and empirical literature on the determinants of acquisition premiums. The chapter begins with the role of synergies and overpayment, followed by the theoretical frameworks that lay the ground for the study. Finally, the study's hypotheses are developed.

2.1 Acquisition Premium: Synergies and Overpayment

For a corporate acquisition to be successful, the acquirer typically has to offer a price that exceeds the target firm's pre-announcement market value. The amount paid in excess of this value, known as the acquisition premium (Laamanen, 2007), is generally considered to be value-creating only if the expected synergies from the acquisition exceed the premium paid (Damodaran, 2005). Empirical evidence supports the view that synergies are the primary driver of premiums, with acquirers paying higher premiums when greater synergies are expected (Bradley et al., 1988; Gupta & Gerchak, 2002; Madura et al., 2012). Bradley et al. (1988) confirm this by showing that successful acquisitions, on average, generate positive combined profits for acquirers and target firm shareholders. In practice, however, premiums frequently exceed what synergies can justify. Hayward and Hambrick (1997) find that acquirers consistently pay substantial premiums. Yet the returns to acquiring firm shareholders around the announcement are negative on average, suggesting that overpayment is the rule rather than the exception.

Two different explanations have been proposed for this pattern. The first is rooted in agency theory. Managers with access to free cash flow and limited profitable investment opportunities may face incentives to bid higher in acquisitions to serve their own objectives, including empire-building and establishment, rather than maximising shareholder value. This prioritisation may in turn result in premiums that exceed any justified synergy values (Jensen, 1986). The second explanation is more behavioural. Overconfident managers often overestimate both the available synergies from the acquisition and their own ability to realise them, which may lead them to pay higher premiums. This is not necessarily due to intentional self-interest, but rather to a systematic valuation error (Roll, 1986; Hayward & Hambrick, 1997). Malmendier and Tate

(2008) show that these two mechanisms work together. Overconfident CEOs are most likely to overpay when they have access to more internal funds, effectively combining the agency and behavioural mechanisms.

With this background, the theoretical framework of this study is created. The following section examines the specific mechanism through which acquirer characteristics, such as leverage, stock return volatility, and free cash flow, are expected to influence the size of the acquisition premium, drawing on agency theory, the free cash flow hypothesis, the hubris hypothesis, and the information asymmetry framework.

2.2 Theoretical Framework and Empirical Evidence

2.2.1 Agency Theory and Managerial Discretion

The primary framework for understanding managerial behaviour in corporate acquisitions is the agency framework developed by Jensen and Meckling (1976). It formalises the conflict of interest that arises when ownership and control are separated, resulting in managers and shareholders having different incentives. In the context of mergers and acquisitions, this conflict arises when managers undertake transactions that serve their private interests rather than maximising shareholder value. Since managers do not fully bear the costs of their decisions but may gain significant private benefits, the agency framework predicts that managerial behaviour in corporate acquisitions may deviate from what is in shareholders' best interest.

Jensen (1986) extends this reasoning by identifying free cash flow as a primary cause of agency conflicts. He defines free cash flow as cash left over after funding all necessary investments with positive net present values. When managers control substantial free cash flow, they face less pressure from external capital markets and have greater flexibility to make acquisitions that expand the firm rather than to return capital to shareholders. Jensen (1986) calls this empire-building behaviour, and the incentive for it is particularly strong in mature industries with limited growth opportunities, where managers are unable to justify retention of cash through profitable investments. This matters for acquisition premiums because managers with excess

cash may simply be willing to pay more, since the goal is to make the acquisition rather than to pay the right price. Morck et al. (1990) provide empirical support for this argument, finding that acquisitions driven by diversification or growth incentives generate negative returns for the acquiring firm's shareholders, consistent with the prediction that managers may undertake acquisitions that serve managerial objectives rather than shareholder value.

Shleifer and Vishny (1990) further developed the agency theory by introducing the concept of managerial entrenchment. They argue that managers invest in complementary skills, making themselves more valuable to the firm and harder to replace. In the context of corporate acquisitions, this implies that managers may pursue acquisitions that make them look good rather than those that offer the greatest synergy potential.

In addition, Masulis et al. (2007) incorporate governance into the agency framework, showing that firms with more antitakeover regulations, and thus weaker external governance, make acquisitions that generate lower announcement returns. Their results confirm that when managers are insulated from the market's disciplinary effects on corporate control, they are more likely to undertake value-destroying acquisitions. This motivates interpreting leverage as a governance mechanism in its own right, whereby debt obligations and creditor monitoring can limit managers' ability to overpay for targets even when shareholder oversight is weak. Barger et al. (2008) find that public acquirers pay substantially higher premiums than private acquirers, connecting this to greater agency problems in public firms where the separation of ownership and control is most pronounced. This result directly links the agency framework to acquisition premiums, suggesting that managerial discretion is associated with systematically higher premiums.

2.2.2 The Free Cash Flow Hypothesis

The free cash flow (FCF) hypothesis builds directly on the agency framework and is one of the most influential theories in the empirical literature on mergers and acquisitions. It was first introduced by Jensen (1986), who argues that agency costs associated with free cash flow are most pronounced in firms that generate significant cash flow but face a limited number of

profitable investment opportunities. In such firms, managers have both the resources and the incentive to make acquisitions that cause the firm to grow beyond its optimal size. Crucially, because these acquisitions can be funded internally, managers avoid the scrutiny that comes with raising external capital and can instead use their free cash flow to make acquisitions that serve their private objectives rather than shareholder value. The central prediction of the FCF hypothesis is therefore that firms with high free cash flow and low growth opportunities are more likely to make value-destroying acquisitions and pay excessively high acquisition premiums (Jensen, 1986).

Several studies have put these predictions to the test. Lang et al. (1991) provide one of the earliest direct tests. Using Tobin's Q as a proxy for investment opportunities, they examine bidder returns in tender offers during 1968-1986. Their main finding is that bidder returns are significantly negative for acquirers with high cash flow and low Tobin's Q. In contrast, acquirers with high cash flow and high Q do not experience the same value destruction.

Harford (1999) takes a different approach by directly examining the acquisition behaviour of cash-rich firms. His study uses a comprehensive sample of US firms and finds that cash-rich firms are significantly more likely to undertake acquisitions, and that these acquisitions tend to be value-destroying, as reflected in abnormal returns around the announcement. Harford (1999) also shows that this tendency is not driven by superior investment opportunities, but is consistent with Jensen's (1986) prediction that excess cash enables managers to pursue acquisitions that would not be possible under external capital market scrutiny. Harford's (1999) results suggest that the level of internal cash is a meaningful predictor of both acquisition activity and quality, providing further reason for examining a firm's free cash flow in the context of acquisition premiums.

Stulz (1990) offers a formal theoretical model that complements Jensen's (1986) argument. In his model, managers derive private benefits from controlling a larger asset base and therefore have an inherent preference for overinvestment. Debt serves as a disciplining mechanism by reducing the cash flow available for managerial discretion. However, Stulz (1990) also shows that excessive debt can lead to underinvestment, as managers are forced to forgo positive-NPV

projects to meet debt obligations. In his framework, the optimal capital structure balances the costs of overinvestment with those of underinvestment. This is relevant to this study's examination of leverage, as it predicts a non-linear relationship in which moderate leverage disciplines managers and reduces overpayment, whereas excessive leverage may lead to underinvestment.

Richardson (2006) provides evidence from a large sample on the extent of overinvestment associated with free cash flow. By looking at a broad panel of US firms, he finds that firms with the highest level of free cash flow invest significantly more than what their growth opportunities justify. This overinvestment problem is most evident in firms with weak governance, consistent with the view that agency costs drive the misallocation of free cash flow. Although Richardson's (2006) paper focuses on capital expenditures rather than corporate acquisitions specifically, his findings are still applicable to this study's context. If free cash flow leads to a general overinvestment problem, the acquisition premium paid represents one channel through which this overinvestment is demonstrated.

The FCF hypothesis also offers a clear prediction regarding the role of leverage. If debt reduces free cash flow and increases external monitoring, highly leveraged acquirers should face stricter constraints on their ability to overpay in acquisitions. This disciplining function of debt is often referred to as the debt disciplining hypothesis, which suggests that leverage serves as a governance mechanism that limits value-destroying acquisition behaviour, as a larger proportion of cash flow is used to pay debt obligations (Jensen, 1986). However, this prediction conflicts with Jensen and Meckling's (1976) asset substitution hypothesis, which states that highly leveraged firms may bid more aggressively because shareholders benefit from increased firm-level risk, whereas debt holders do not. This study examines this contradiction empirically by testing whether the effect of leverage on premiums varies with the acquirer's free cash flow. This allows for a separation of the disciplining effect of debt from the risk-shifting incentive implied by the asset substitution hypothesis.

2.2.3 The Hubris Hypothesis and Managerial Overconfidence

The hubris hypothesis, introduced by Roll (1986), offers a more behavioural explanation than agency theory for why certain acquirers pay excessive acquisition premiums. Roll (1986) suggests that some acquisitions are not driven by rational economic calculations but by managerial overconfidence. The manager of the acquiring firm simply believes the target is worth more than the market thinks, even when no real synergies exist. This means that the premium paid reflects a valuation error rather than an expectation of value creation. Roll (1986) draws an analogy to the winner's curse to explain this, in which the winning bidder is the one who has overestimated the target's value the most.

Hayward and Hambrick (1997) were among the first to test this empirically, developing measures of CEO hubris based on the acquiring firm's recent stock returns, recent media praise for the CEO, and the CEO's relative compensation. In a sample of 106 large acquisitions, they find that each of these hubris indicators is positively and significantly associated with the acquisition premium paid. Their results also show that board vigilance, as measured by the proportion of outside directors and the separation of CEO and chairman roles, moderates the hubris effect. This finding is important because it suggests that governance mechanisms can reduce the tendency of overconfident managers to overpay in acquisitions, thereby linking the behavioural perspective to the agency framework discussed in Section 2.2.1 Agency Theory and Managerial Discretion.

Malmendier and Tate (2005, 2008) build on Roll (1986) and Hayward and Hambrick (1997) by examining how CEO overconfidence affects acquisition behaviour. They find that overconfident CEOs are significantly more likely to undertake acquisitions, especially when they have access to internal financing. These results connect the behavioural and free cash flow perspectives. Moreover, they show that the stock returns to the acquiring firm's shareholders around the announcement date are significantly more negative for hubris-driven CEOs than for their peers, indicating that the market recognises the value-destroying potential of hubris-driven transactions.

While this study does not include a direct measure of CEO hubris or overconfidence in the regression analysis, the hubris hypothesis remains a relevant explanation for the relationships

examined. A highly leveraged acquirer may not only signal financial risk but may also reflect a management team whose aggressive capital structure choices indicate overconfident decision-making. Similarly, high stock return volatility may not only increase the market risk embedded in the deal but also create an environment where valuation uncertainty provides cover for overestimating synergies. Since both the agency-based and behavioural explanations may hold simultaneously, the results of this study should be interpreted with both perspectives in mind.

2.2.4 Information Asymmetry and Signalling

Information asymmetry offers another explanation for why acquirer characteristics can affect the acquisition premium paid. It arises when managers have private information about their firm's value that outside investors cannot fully observe. Myers and Majluf (1984) show that in such situations, financing decisions can signal what managers privately know about their firm's value. In the context of corporate acquisitions, this signal is most visible in the choice of payment method. Managers who believe their equity is overvalued prefer to finance deals with stock, while those who believe their equity is undervalued prefer cash deals (Myers & Majluf, 1984). Target shareholders aware of this incentive have shown to demand higher premiums in stock-financed deals, to compensate for the risk of receiving overvalued equity. The same logic applies to stock return volatility. Acquirers with higher stock return volatility are more difficult for outside investors to value correctly, meaning that target shareholders face greater uncertainty about the true value of what they are receiving, which may lead them to demand a higher premium (Myers & Majluf, 1984).

Several empirical studies find support for the signalling argument. Travlos (1987) finds that stock-financed acquisitions generate significantly more negative market reactions than cash deals, consistent with the view that stock payments signal overvaluation. Fuller et al. (2002) show that this effect is most pronounced in public-to-public transactions, where target shareholders can independently evaluate the acquirer's equity, directly relevant to the sample in this study.

2.3 Hypothesis Development

The theoretical frameworks presented above offer competing predictions regarding the relationship between an acquirer's risk exposure and the acquisition premium paid in corporate acquisitions. On the one hand, the debt disciplining hypothesis suggests that higher leverage constrains managerial behaviour by subjecting acquirers to greater creditor scrutiny and tighter financial covenants, thereby reducing their ability to pay excessive premiums. On the other hand, agency theory and the free cash flow hypothesis suggest that the same risk characteristics may reflect underlying managerial incentives that cause acquirers to overpay. Managers of highly leveraged firms may pursue acquisitions to diversify firm-specific risk at shareholders' expense, while managers with excess cash flow face fewer constraints on their bidding behaviour. The hubris hypothesis offers an additional interpretation, suggesting that a highly leveraged acquirer or one with volatile share prices may reflect not only financial risk but also management prone to overconfidence and overbidding.

Beyond agency theory and hubris, the signalling perspective offers yet another explanation. Acquirer risk characteristics, such as leverage and stock return volatility, can act as observable signals that shape how target shareholders perceive the acquirer and thereby influence the premium they demand. A highly leveraged acquirer may raise concerns among target shareholders about the acquirer's financial strength. At the same time, a volatile stock price makes it harder for target shareholders to assess what the acquirer's shares are actually worth, particularly in stock-financed deals. Since agency theory, the hubris hypothesis, and the signalling framework all offer different, sometimes opposing predictions, there is no obvious answer to how acquirer risk exposure affects the premium paid. Given that the theory offers opposing predictions for leverage, this study tests both directions through two competing hypotheses. For volatility, the evidence points more consistently towards a positive relationship, and a directional hypothesis is formulated accordingly. The role of free cash flow is examined using an interaction model to test whether it moderates the effects of leverage and volatility on the premium paid.

2.3.1 Financial Risk and Acquisition Premium

The debt disciplining hypothesis (Jensen, 1986; Stulz, 1990) and the empirical evidence from Lang et al. (1991) predict that high leverage constrains managerial discretion by reducing free cash flow and increasing creditor monitoring, thereby leading to lower premiums. The asset substitution hypothesis (Jensen & Meckling, 1976), however, predicts that highly leveraged firms have incentives to pursue risky investments at the expense of debt holders, which could lead managers to bid more aggressively and pay higher premiums. Given these theoretical predictions, two directional hypotheses are formulated:

H_{1a}: There is a negative relationship between acquirer leverage and the acquisition premium paid, consistent with the debt disciplining hypothesis

H_{1b}: There is a positive relationship between acquirer leverage and the acquisition premium paid, consistent with the asset substitution hypothesis

2.3.2 Market Risk and Acquisition Premium

The hubris hypothesis (Roll, 1986) and empirical evidence from Hayward and Hambrick (1997), Malmendier and Tate (2008), and Simonyan (2014) suggest that managers operating in more volatile markets may exhibit greater overconfidence in their valuation abilities, leading to higher premiums. The information asymmetry framework (Myers & Majluf, 1984) further suggests that high-volatility firms are harder for outside investors to value correctly, which may lead target shareholders to demand higher premiums to compensate for this uncertainty. Unlike leverage, where theory points in opposite directions, both perspectives here predict a positive relationship, leading to a single directional hypothesis:

H₂: There is a positive relationship between an acquirer's market risk, measured by stock return volatility, and the acquisition premium paid

2.3.3 Free Cash Flow and Acquisition Premium

The first two hypotheses in the study test whether acquirer risk exposure is associated with acquisition premiums. However, finding such a relationship does not in itself explain what drives it. The free cash flow hypothesis (Jensen, 1986) offers a framework for examining the underlying mechanism.

The debt disciplining hypothesis predicts that highly leveraged acquirers are less likely to overpay for targets, since debt obligations tie up cash that would otherwise be available for acquisitions (Jensen, 1986). If this mechanism drives the leverage-premium relationship, the effect should depend on the firm's level of internal resources. For cash-rich firms with significant internal cash flow, leverage may be less of a problem since they can finance acquisitions internally regardless of their debt level. For cash-poor acquirers, leverage should be more binding because there is less discretionary cash flow to fall back on, making the disciplining function of debt more consequential. Similarly, the relationship between stock return volatility and acquisition premiums may also depend on free cash flow. If volatility partly captures managerial overconfidence or aggressive risk-taking, this tendency may be even stronger when managers have substantial internal cash available (Malmendier & Tate, 2008).

To test this, the study uses an interaction model in which the main independent variables, leverage and volatility, interact with a cash-rich dummy, defined as 1 if the acquirer's free cash flow exceeds the sample median and 0 otherwise, following the approach of Lang et al. (1991). The interaction terms directly test whether the effect of leverage and volatility on the premium differs significantly between cash-rich and cash-poor acquirers. This leads to the third hypothesis:

H₃: The relationship between acquirer risk exposure and the acquisition premium paid is moderated by the acquirer's level of free cash flow

H3 is motivated by the prediction that free cash flow increases the agency costs associated with acquisitions. Lang et al. (1991) show that acquisitions made by cash-rich acquirers with limited growth opportunities generate significantly negative returns for acquiring firm shareholders,

confirming that it is the combination of excess cash and few profitable investment opportunities that drives excessively high acquisition premiums. By interacting leverage and stock return volatility with a cash-rich indicator, this study formally tests whether the mechanisms underlying H1a, H1b, and H2 are moderated by the acquirer's level of free cash flow, as predicted by Jensen (1986).

3. Data and Sample Description

This chapter describes the data and sample used in the empirical analysis. It covers sample construction and variable definitions, and presents summary statistics and correlation analysis for the final sample.

3.1 Sample Description

All data in this study are retrieved from S&P Capital IQ Pro, a widely used and reliable financial database known for its extensive coverage of M&A transactions and firm-level financial metrics. Using a single database ensures consistency and eliminates the need to merge sources, reducing the risk of data inconsistencies. Transaction-level data, including the acquisition announcement date, deal status, consideration structure, transaction value, and the acquisition premium, are collected alongside acquirer-level financial data such as total assets, total debt, net income, EBITDA, taxes, interest expense, dividends paid, market capitalisation, and stock return volatility. In line with previous research (Moeller et al., 2004; Lang et al., 1991), acquirer financial statement data is measured at the fiscal year-end preceding the announcement to reflect the acquirer's financial position as observable to the market at the time of the deal. Stock return volatility is measured over 1 year, defined as the annualised standard deviation of daily returns over 252 trading days (Simonyan, 2014), ending 20 days before the announcement (Meulbroek, 1992). Unlike the financial statement variables, stock return volatility captures market-based risk in the period immediately preceding the announcement.

The initial sample consists of completed M&A transactions involving US targets announced between January 1, 2000, and January 1, 2025, with a minimum transaction value of \$0.5 million USD, consistent with prior similar research (Moeller et al., 2004; Simonyan, 2014). This threshold is applied to exclude very small transactions that are unlikely to reflect strategic acquisition decisions. Smaller deals are subject to higher relative transaction costs, less analyst coverage, and less market scrutiny, all of which weaken the link between acquirer characteristics and the premium paid (Moeller et al., 2004; Fuller et al., 2002). In transactions of this size, the premium tends to be shaped more by the specific circumstances of the individual deal than by any systematic factors about the acquirer. The data on the acquisition premium itself is also less

reliable for small deals, given that limited analyst coverage and market attention make it harder for prices to accurately reflect the true value of the transaction.

The sample period from January 1, 2000 to January 1, 2025 is deliberately chosen to capture a broad range of market conditions in the United States. It includes the dot-com bust of the early 2000s, the 2008-2009 financial crisis, and a prolonged low-interest-rate environment throughout the 2010s. Over this period, total US M&A deal value fluctuated from a low of \$521 billion in 2002 to an all-time peak of \$3,474 billion in 2021 (IMAA, 2026), reflecting the sensitivity of acquisition markets to credit conditions and investor sentiment. This variation in market conditions is important for this study, as the mechanisms through which leverage and volatility influence acquisition premiums are likely to operate differently across credit environments, and a larger sample period reduces the risk that the results simply reflect the conditions of a single era.

Furthermore, acquirers operating in the financial and utility sectors are excluded from the sample, as their leverage ratios are not comparable to those of non-financial firms and are heavily influenced by regulation (Fama & French, 1992; Moeller et al., 2004). Additionally, only transactions that result in a change of control are included in the sample, meaning the acquirer acquires an ownership stake exceeding 50% of the target's voting equity. This ensures that the acquirer gains full decision-making authority over the target and excludes partial stake acquisitions, where the premium is likely to reflect a different set of incentives and negotiation dynamics (Grossman & Hart, 1980; Rossi & Volpin, 2004). Finally, only transactions for which the one-month acquisition premium is available are included, as this is the dependent variable in the study.

Applying these criteria yields an initial sample of 3,457 transactions. Several data availability requirements are then applied before the final sample is established. First, observations with missing values for any regression variables, including financial statement items and market data, are removed. Additionally, transactions are excluded if sufficient trading history is unavailable to compute stock return volatility (i.e., fewer than 252 trading days) or if the acquirer or target SIC codes are missing, as these are required for industry classification and fixed effects. Deals with undisclosed consideration structures are also excluded, as the payment method is an important

control variable in the analysis. Finally, a small number of observations were removed due to clearly incorrect values in the Capital IQ Pro database. After applying all data availability requirements, the final sample consists of 1,654 completed public-to-public transactions announced between January 1, 2000, and January 1, 2025.

3.2 Dependent Variable

3.2.1 Acquisition Premium

In existing research on corporate acquisitions, the acquisition premium is a common dependent variable, often used to examine the factors that drive acquirers to pay above the target firm's pre-announcement market value (Laamanen, 2007; Walkling & Edmister, 1985; Hayward & Hambrick, 1997; Alexandridis et al., 2012; Simonyan, 2014). In line with the theoretical and empirical arguments presented in Section 2. Literature Review and Hypothesis Development, the acquisition premium therefore serves as the dependent variable in this study.

The acquisition premium is retrieved directly from S&P Capital IQ Pro, where it is defined as the percentage difference between the offer price and the target's share price four weeks before the announcement. This measure is also consistent with Alexandridis et al. (2012) and Golubov et al. (2012). The four-week window is chosen because stock prices often rise before the official acquisition announcement, driven by market anticipation or information leakage (Schwert, 1996). The four-week window is therefore set to capture this movement and the true premium.

3.3 Explanatory Variables

3.3.1 Financial Risk (Leverage)

Leverage is measured as total debt divided by total assets for the fiscal year preceding the announcement date, in line with Maloney et al. (1993) and Moeller et al. (2004). This ensures that the variable captures the acquirer's financial position before any deal-related financing

activity. This is consistent with standard practice in cross-sectional M&A research (Moeller et al., 2004; Pan et al., 2025).

3.3.2 Market Risk (Stock Return Volatility)

Stock return volatility is included as the primary measure of the acquirer's market risk. Following Simonyan (2014), stock return volatility is measured as the annualised standard deviation of daily stock returns over a 252 trading-day window, as presented in *Appendix 1*. The trading-day window spans a full trading year and provides sufficient observations to estimate a stable, representative measure of the acquirer's underlying risk profile. Consistent with Simonyan (2014) and Walkling and Edmister (1985), the measurement window ends 20 trading days before the announcement date to exclude deal-related price movements in the pre-announcement period. This adjustment is motivated by Meulbroek (1992), who finds that almost half of the pre-announcement price run-up occurs on insider trading days, ensuring that the variable captures underlying market risk rather than acquisition-specific information leakage.

3.3.3 Managerial Discretion (Free Cash Flow)

Free cash flow is included as the third independent variable in this study to test whether acquirer-level managerial discretion, as measured by the availability of internal funds, affects the acquisition premium. Following Lang et al. (1991), free cash flow is measured as EBITDA minus taxes, interest expense, and dividends paid, scaled by total assets for the fiscal year preceding the announcement date. Where dividend data in this study's sample is unavailable, the value is set to zero based on the assumption that no dividends were paid out. Similarly, interest expense is set to zero if a firm reports no outstanding debt. A Cash-Rich indicator is constructed as equal to 1 if the acquirer's free cash flow is above the sample median, and 0 otherwise. Acquirers above the median are referred to as cash-rich, and those below as cash-poor, throughout the analysis.

3.4 Control variables

3.4.1 Return on Assets (ROA)

Return on assets (ROA) is included as a control variable in this study because empirical research shows it can affect bidding behaviour and acquisition premiums. More profitable acquirers may have greater financial flexibility and internal resources, leading to more aggressive bidding and higher premiums (Masulis et al., 2007; Golubov et al., 2012). At the same time, high profitability may reflect stronger managerial quality and operational efficiency, which in turn could result in greater bargaining power and lower premiums paid (Simonyan, 2014). Simonyan (2014) reports a negative and significant coefficient on acquirer ROA, suggesting that more profitable acquirers pay lower premiums. Baker et al. (2012) and Moeller et al. (2004), however, find no statistically significant relationship, suggesting that profitability alone does not consistently explain variation in premiums paid. In this study, ROA is measured as net income divided by total assets at the fiscal year-end before the announcement, in accordance with Moeller et al. (2004), Baker et al. (2012), and Pan et al. (2025).

3.4.2 The Size of the Acquiring Company

The size of the acquiring firm is included as a control variable, as prior studies show that larger firms tend to offer higher acquisition premiums, consistent with the hubris hypothesis (Moeller et al., 2004). Larger acquiring firms may have access to more extensive internal and external financial resources, potentially leading to more aggressive bidding and higher premiums. On the other hand, larger firms may possess greater bargaining power or more disciplined acquisition processes, enabling them to negotiate lower premiums (Alexandridis et al., 2012; Simonyan, 2014). Moeller et al. (2004) find that large acquirers pay significantly higher premiums than smaller firms. In contrast, Simonyan (2014) finds a negative and significant coefficient on the natural logarithm of acquirer assets, suggesting that larger firms may pay lower acquisition premiums. Alexandridis et al. (2012) find that larger acquirers are associated with lower premiums, potentially due to greater complexity and reduced competition for large targets.

In this study, the size of the acquiring company is measured as the natural logarithm of the acquirer's total assets at the fiscal year-end before the announcement, in accordance with Golubov et al. (2012), Simonyan (2014), and Pan et al. (2025).

3.4.3 Tobin's Q

Tobin's Q is included as a control variable to capture the acquirer's company valuation and future growth opportunities, which can influence both acquisition decisions and the acquisition premium. Following Moeller et al. (2004) and Barger et al. (2008), it is measured as the market capitalisation plus the book value of debt, divided by the book value of total assets, at the fiscal year-end before the announcement. Moeller et al. (2004) find a small, statistically insignificant positive coefficient, suggesting that higher valued acquirers do not systematically pay higher premiums in their sample. Baker et al. (2012) include both the bidder's and the target's Tobin's Q in their regression and similarly find no statistically significant relationship for the acquirer's Q.

3.4.4 Relative Deal Size

Relative deal size is included in this study to control for the acquisition's scale relative to the acquirer. Following Fuller et al. (2002) and Moeller and Schlingemann (2005), it is measured as the total transaction value divided by the acquirer's market capitalisation at the fiscal year-end preceding the announcement. Moeller et al. (2004) find a positive, significant coefficient for relative size and acquisition premiums. Indicating that acquisitions that are larger relative to the acquirer are associated with higher premiums paid. Hayward and Hambrick (1997) similarly find a positive but statistically insignificant coefficient on relative target size in their premium regression.

3.4.5 Method of Payment

The method of payment is included since previous research consistently shows that it affects the acquisition premium paid (Fuller et al., 2002; Simonyan, 2014). According to Myers and

Majluf's signalling theory (1984), acquirers who believe their stock is overvalued tend to finance acquisitions with stock, while those who believe their stock is undervalued prefer cash. As a result, stock-financed transactions can signal potential overvaluation, leading target firms to demand higher premiums to compensate for increased uncertainty. Faccio and Masulis (2005) further show that the acquirer's financial condition, including leverage and access to credit lines, significantly influences the choice between cash and stock financing. They suggest that leverage may affect premiums both directly and indirectly, through its influence on the payment method. The payment method is captured by a dummy variable equal to 1 if the acquisition is financed entirely with stock and 0 otherwise, with mixed and cash payments serving as the reference category.

3.4.6 Tender Offer

A tender offer dummy is included in this study because tender offers directly offer to buy target shareholders' shares, typically requiring a higher premium to induce dispersed shareholders to tender. It is defined as a dummy variable equal to one if the acquisition is structured as a tender offer and zero otherwise. This methodology aligns with previous empirical research, including Rossi and Volpin (2004), Baker et al. (2012), and Moeller et al. (2004). Rossi and Volpin (2004) find a positive, statistically significant coefficient between tender offers and acquisition premiums, which they interpret as evidence for the free-rider hypothesis. This hypothesis holds that the bidder in a tender offer must pay a higher premium to induce dispersed shareholders to tender their shares. Moeller et al. (2004) and Baker et al. (2012) also report a positive, significant coefficient in their regressions.

3.4.7 Cross-Border Transactions

A cross-border dummy variable is included in this study to control for potential differences in premiums paid between cross-border and domestic acquisitions. It is defined as a dummy variable equal to 1 if the acquirer and target are domiciled in different countries, and 0 otherwise, consistent with Rossi and Volpin (2004) and Moeller and Schlingemann (2005). Rossi and Volpin (2004) find a positive and statistically significant coefficient, with cross-border deals

associated with approximately 3% higher premiums than domestic deals. They attribute this to differences in investor protection and governance environments between the acquirer and target countries.

3.4.8 Diversifying Acquisitions

A diversifying dummy is included to control for whether the acquisition crosses industry boundaries. It is defined as a dummy variable equal to 1 if the acquirer and target operate in different two-digit SIC industries and 0 otherwise. This methodology is consistent with Moeller et al. (2004), Golubov et al. (2012), and Moeller and Schlingemann (2005). Walkling and Edmister (1985) find that premiums of non-conglomerate offers are approximately 7 percentage points higher than premiums on conglomerate offers. Moeller et al. (2004) similarly find a significant negative coefficient for the conglomerate dummy in their regression. All formulas and dummy variables of the dependent, independent, and control variables are presented in *Appendix I*.

3.5 Summary Statistics

To mitigate the influence of outliers on the regression estimates, all continuous variables except Log(Total Assets) are winsorized at the 1st and 99th percentiles, following standard practice in corporate finance research (Simonyan, 2014). *Table 1* reports summary statistics for the final sample of 1,654 completed transactions.

The mean acquisition premium is 48.32% with a median of 37.5%, consistent with the range reported by Alexandridis et al. (2012) and Barger et al. (2008) for US public-to-public deals. The positive skewness indicates that a subset of high premium transactions drives up the average. The average leverage ratio of 0.230 reflects moderate indebtedness, while the mean stock return volatility of 42.48% suggest substantial variation across the sample, with a standard deviation of 25.66 percentage points.

Regarding deal characteristics, cash deals account for 57.6% of the sample, stock deals for 23.5%, and mixed consideration for 18.9%. In addition, tender offers represent 28.7% of transactions, cross-border deals 20.5%, and diversifying acquisitions 30.4%.

Table 2 reports Mergers and Acquisitions transactions distributed over year and industry. As shown in Panel A, the period 2000-2003 accounts for the largest share of transactions (24.24%), with frequencies gradually declining in later periods, reflecting variation in M&A activity over time. Furthermore, Panel B shows that Manufacturing dominates the sample (61.79%), followed by Services (21.16%), as expected given the composition of firms in the dataset. As shown in Panel C, acquisition premiums also vary across industries, with Manufacturing acquirers paying an average of 50.89%, compared to 46.76 for Service firms. These differences support the inclusion of industry fixed effects in the regression specifications. Overall, the distribution across time and industries appears broadly consistent with typical M&A patterns.

Table 3 reports t-tests for differences in means between high-volatility and low-volatility acquirers, as well as between high-leverage and low-leverage acquirers. As seen in Panel A, where the acquirers are split at the sample median, the two groups do not differ significantly in the average premium paid (47.92% versus 48.73%, $p = 0.726$). This suggests that the unconditional relationship between volatility and premiums is weak. However, the groups differ on other dimensions. High-volatility acquirers are significantly less leveraged (0.209 versus 0.251, $p < 0.001$), have lower free cash flow (0.027 versus 0.083, $p < 0.001$), are less profitable (-0.034 versus 0.071, $p < 0.001$) and are substantially smaller (Log Assets of 14.01 versus 16.17, $p < 0.001$). These patterns confirm that volatile acquirers in the sample tend to be smaller, less profitable firms with fewer internal resources, highlighting the importance of controlling for these characteristics in the multivariate analysis to isolate volatility's independent effect on premiums.

Panel B shows the corresponding comparison between high-leverage and low-leverage acquirers. Similar to the volatility split, the two groups do not differ significantly in average premiums (47.68% versus 48.97%, $p = 0.579$), indicating a weak unconditional relationship between leverage and premiums. High-leverage acquirers are significantly larger (Log Assets of 15.61

versus 14.57, $p < 0.001$) and have lower Tobin's Q (1.73 versus 2.06, $p < 0.001$, indicating that larger, more mature firms with fewer growth opportunities tend to carry more debt. High-leverage firms also have marginally higher free cash flow (0.061 versus 0.049, $p = 0.048$), which is relevant to the interaction analysis testing H3 and suggests that leverage and free cash flow are not independent.

Table 1: Summary Statistics

	N	Mean	SD	Min	Median	Max
Acquisition Premium (%)	1654	48.324	47.391	-42.130	37.505	274.150
Leverage	1654	.230	0.183	0.000	.208	.846
Stock Return Volatility (%)	1654	42.485	25.662	14.121	34.480	140.786
Free Cash Flow / Assets	1654	.055	0.122	-.608	.074	.290
Cash-Rich Indicator	1654	.500	0.500	0.000	.500	1.000
Return on Assets	1654	.019	0.187	-1.214	.054	.233
Log of Total Assets	1654	15.089	2.250	6.708	15.171	22.823
Total Assets (in millions)	1654	28113.151	207670.344	0.819	3880.106	8163480
Tobin's Q	1654	1.898	1.536	.316	1.459	10.457
Relative Deal Size	1654	.358	0.539	.001	.146	2.962
Cash Payment	1654	.576	0.494	0.000	1.000	1.000
Stock Payment	1654	.235	0.424	0.000	0.000	1.000
Mixed Payment	1654	.189	0.391	0.000	0.000	1.000
Tender Offer	1654	.287	0.453	0.000	0.000	1.000
Cross-Border	1654	.205	0.404	0.000	0.000	1.000
Diversifying Deal	1654	.304	0.460	0.000	0.000	1.000

Table 1 reports summary statistics for all variables used in the regression analysis. Continuous variables except Log(Assets) are winsorized at the 1st and 99th percentiles. Total Assets is reported unwinsorized for descriptive purposes; all regressions use Log(Total Assets). For variable definitions, see [Appendix 1](#).

Table 2: Mergers and Acquisitions Distributed over Year and Industry

Panel A: Year				Panel B: Industry			
	Freq.	Percent	Cum.		Freq.	Percent	Cum.
2000-2003	401	24.24%	24.24	Construction	14	0.85%	0.85
2004-2007	318	19.23%	43.47	Manufacturing	1022	61.79%	62.64
2008-2011	243	14.69%	58.16	Mining, Oil & Gas	105	6.34%	68.98
2012-2015	233	14.09%	72.25	Other	13	0.79%	69.77
2016-2019	233	14.09%	86.34	Retail Trade	56	3.39%	73.16
2020-2024	226	13.66%	100.00	Services	350	21.16%	94.32
				Transportation	62	3.75%	98.07
				Wholesale Trade	32	1.93%	100.00
Total	1654	100.00%		Total	1654	100.00%	

Panel C: Mean Acquisition Premium by Industry

Industry	Mean	SD	Freq.
Construction	53.290	43.375	14
Manufacturing	50.887	46.997	1022
Mining, Oil & Gas	34.196	46.099	105
Other	29.677	24.816	13
Retail Trade	44.715	34.970	56
Services	46.763	47.555	350
Transportation	53.733	66.938	62
Wholesale Trade	31.152	30.809	32
Total			1654

Table 2 reports the distribution of the 1,654 sample transactions by announcement sub-period (Panel A), acquirer industry (Panel B) and mean acquisition premium by industry (Panel C).

Table 3: Differences in Means

Panel A: High-Volatility vs Low-Volatility Acquirers

Variable	Mean (Low)	SD (Low)	N	Mean (High)	SD (High)	N	Diff	T-stat	p-value
Premium %	47.916	44.800	827	48.732	49.872	827	0.816	0.350	0.726
Leverage	0.251	0.170	827	0.209	0.193	827	-0.042	-4.739	0.000
Free Cash Flow	0.083	0.046	827	0.027	0.161	827	-0.056	-9.636	0.000
Return on Assets	0.071	0.057	827	-0.034	0.247	827	-0.105	-11.907	0.000
Tobin's Q	1.842	1.227	827	1.954	1.791	827	0.112	1.489	0.137
Log of Total Assets	16.167	1.818	827	14.011	2.122	827	-2.156	-22.188	0.000
Relative Deal Size	0.285	0.474	827	0.431	0.589	827	0.146	5.551	0.000

Panel B: High-Leverage vs Low-Leverage Acquirers

Variable	Mean (Low)	SD (Low)	N	Mean (High)	SD (High)	N	Diff	T-stat	p-value
Premium %	48.970	48.277	827	47.678	46.509	827	-1.292	-0.554	0.579
Leverage	0.086	0.074	827	0.374	0.142	827	0.288	51.725	0.000
Free Cash Flow	0.049	0.136	827	0.061	0.106	827	0.012	1.980	0.048
Return on Assets	0.019	0.197	827	0.019	0.177	827	0.000	0.023	0.982
Tobin's Q	2.061	1.760	827	1.734	1.252	827	-0.327	-4.348	0.000
Log of Total Assets	14.569	2.346	827	15.609	2.021	827	1.041	9.663	0.000
Relative Deal Size	0.352	0.568	827	0.365	0.509	827	0.012	0.469	0.639

Table 3 reports t-tests for differences in means between subgroups of acquirers. Panel A splits the sample at the median stock return volatility to distinguish high- and low-volatility acquirers. Panel B splits the sample at the median of leverage into high-leverage and low-leverage acquirers.

3.6 Correlation Analysis

Table 4 shows the pairwise correlation matrix. Several correlations are noteworthy for interpreting the regression analysis. *Leverage* and *Volatility* are negatively correlated (-0.118, $p < 0.05$), indicating that highly volatile firms tend to carry less debt. *Volatility* and *Log of Total Assets* are strongly negatively correlated (-0.570), suggesting that smaller acquirers within the sample exhibit greater market risk.

The *Stock Payment* dummy is positively correlated with *Volatility* (0.460) and negatively correlated with *Acquisition Premium* (-0.121), consistent with Myers and Majluf's (1984) signalling framework, in which volatile firms are more likely to use equity financing, and stock deals are associated with lower premiums.

As shown in *Table 4*, the continuous variables *Free Cash Flow* and *ROA* exhibit a high positive correlation of 0.715. While this value approaches thresholds often cited as indicative of severe multicollinearity (Brooks, 2008), this issue is avoided in Model (5). Following Lang et al. (1991), *Free Cash Flow* is transformed into a binary *Cash-Rich* Indicator rather than being used in its continuous form. This categorical split significantly reduces collinearity with *ROA*, allowing the model to safely retain both measures to capture distinct aspects of a firm's financial profile without the risk of inflated standard errors.

In contrast, the correlation between the two main independent variables, *Leverage* and *Volatility*, remains modest (-0.118), confirming that they capture distinct dimensions of acquirer risk and can be included jointly in Model (4) without concern for multicollinearity (Wooldridge, 2016).

Table 4: Pairwise Correlation

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) Acquisition Pr.	1.000											
(2) Leverage	-0.036	1.000										
(3) Stock Return Vol.	-0.026	-0.118*	1.000									
(4) Free Cash Flow	0.023	0.020	-0.453*	1.000								
(5) Return on Assets	0.081*	-0.042	-0.511*	0.715*	1.000							
(6) Log of Total Assets	0.062*	0.216*	-0.570*	0.397*	0.420*	1.000						
(7) Tobin's Q	0.050*	-0.091*	0.158*	-0.063*	-0.038	-0.085*	1.000					
(8) Relative Deal Size	-0.111*	0.064*	0.176*	-0.118*	-0.109*	-0.315*	-0.206*	1.000				
(9) Stock Payment	-0.121*	-0.038	0.460*	-0.292*	-0.345*	-0.317*	0.062*	0.192*	1.000			
(10) Tender Offer	0.187*	-0.032	-0.123*	0.119*	0.126*	0.115*	0.040	-0.174*	-0.292*	1.000		
(11) Cross-Border	0.071*	-0.042	-0.128*	0.015	0.063*	0.093*	-0.065*	-0.001	-0.151*	0.125*	1.000	
(12) Diversifying	-0.067*	-0.021	-0.009	-0.018	0.016	0.065*	-0.037	-0.086*	0.018	-0.032	-0.006	1.000

Table 4 presents the pairwise correlation coefficients among all variables. Statistical significance at the 5% level is denoted by *.

4. Methodology

This chapter outlines the econometric methodology employed in the study. The regression specifications are presented, followed by a discussion of the key modelling choices, including fixed effects, heteroskedasticity, and endogeneity.

4.1 Econometric Design

To examine the relationship between an acquirer's risk exposure and the premiums paid in corporate acquisitions, this study uses a multivariate Ordinary Least Squares (OLS) regression framework. OLS is the standard estimation method in cross-sectional studies of acquisition premiums and has been applied in closely related work, such as Simonyan (2014), Hayward and Hambrick (1997), and Walkling and Edmister (1985). Furthermore, year fixed effects are included in the study because deals announced during the same period naturally share the same interest-rate environment, credit conditions, and investor sentiment, which influence premiums but are unrelated to individual acquirer characteristics. In addition to year fixed effects, industry fixed effects are included because some industries structurally pay higher or lower premiums than others, regardless of any acquirer's particular risk profile. Finally, heteroskedasticity-robust standard errors are used throughout the study, since the sample spans a wide range of firm sizes and deal values. For instance, a small technology acquisition looks very different from a large cross-border merger, and this variation means that the error terms are unlikely to be constant across observations. Without this correction, standard errors would be understated, and significance levels overstated, making results appear more reliable than they actually are (Wooldridge, 2016).

4.1.1 Multivariate Analysis

To test H_{1a} , H_{1b} , and H_2 and examine the relationship between acquirer financial risk, market risk, and the acquisition premium, Models 1 through 4 are estimated. Models 1 and 2 are both bivariate specifications that isolate the unconditional relationships between leverage and the premium and between volatility and the premium, respectively, without controlling for other

variables. Model 3 then introduces the full set of control variables alongside both independent variables, and Model 4 further adds year and industry fixed effects to account for time-varying macroeconomic conditions and systematic differences across industries.

Moreover, to test H_3 , whether free cash flow moderates the relationship between acquirer risk exposure and the acquisition premium, Model 5 extends Model 4 by introducing interaction terms between the independent variables and a cash-rich indicator. The cash-rich dummy equals 1 if the acquirer's free cash flow exceeds the sample median and 0 otherwise. The baseline specifications for Models (1) through (3) are presented in [Appendix 2](#), and a full variable list is presented in [Appendix 1](#).

(4) Main Model

$$Premium_i = \beta_0 + \beta_1 Leverage_i + \beta_2 Volatility_i + \beta_k Controls_{k,i} + \delta_{year} + \gamma_{industry} + \epsilon_i$$

(5) H3 Interaction Model

$$Premium_i = \beta_0 + \beta_1 Leverage_i + \beta_2 Volatility_i + \beta_3 CashRich_i + \beta_4 Lev * CashRich_i + \beta_5 Vol * CashRich_i + \beta_k Controls_{k,i} + \delta_{year} + \gamma_{industry} + \epsilon_i$$

In the regression above, $Premium_i$ is the acquisition premium paid in the deal i . $Leverage_i$, $Volatility_i$, and $CashRich_i$, are the main independent variables, representing the acquirer's financial risk, market risk, and managerial discretion, respectively. $Lev * CashRich_i$ and $Vol * CashRich_i$ are interaction terms that capture whether the effect of leverage and volatility on the premium differs between cash-rich and cash-poor acquirers. The control variables are defined in [Section 3.4 Control Variables](#). δ_{year} are indicator variables for each announcement year, with year 2000 as the base category. $\gamma_{industry}$ represents industry fixed effects based on two-digit SIC codes, excluding financial and utility firms. Finally, ϵ_i is the unobserved error term.

4.1.2 Modelling Choices

To perform an Ordinary Least Squares (OLS) regression, certain assumptions must be met for the results to be statistically reliable. The following sections discuss the key assumptions most relevant to this study and how each is addressed in the empirical design.

4.1.2.1 Industry and Year Fixed Effects

In cross-sectional M&A research, unobserved heterogeneity across time and industries can bias coefficient estimates if correlated with the explanatory variables. For instance, aggregate market conditions such as interest rate environments, credit availability, and investor sentiment differ over time. They may simultaneously affect both acquirer risk characteristics and the acquisition premium paid. At the same time, systematic differences across industries, such as leverage norms, deal competition, or valuation practices, could confound the relationship between acquirer risk exposure and acquisition premiums if not controlled for.

To address this, year fixed effects are included in Models (4) and (5) to absorb time-varying macroeconomic conditions that affect all transactions announced in a given year. This approach is consistent with Harford (2005), who demonstrates that merger activity clusters around periods of high capital liquidity, and with Rhodes-Kropf and Viswanathan (2004), who found that market-wide misvaluation can systematically inflate premiums during boom periods. Without year fixed effects, the estimated coefficients on leverage and volatility could partly reflect these aggregate trends rather than firm-level risk exposure.

The inclusion of industry fixed effects based on two-digit SIC codes is motivated by Mitchell and Mulherin (1996), who show that M&A activity clusters by industry in response to sector-specific shocks such as regulation or technological changes. Industries with structurally higher leverage ratios or more deal activity may also differ systematically in average premium levels for reasons unrelated to the acquirer risk mechanisms studied in this paper. Industry fixed effects absorb these cross-sectional differences, ensuring that the estimated relationship reflects variation within industries.

To ensure valid inference and account for potential non-constant error variance, all regressions in this study are estimated using heteroskedasticity-robust standard errors. This approach is consistent with previous research in the same field, such as Moeller et al. (2004) and Alexandridis et al. (2012). The progressive introduction of fixed effects across model specifications, from no fixed effects in Models (1) through (3), to both year and industry fixed effects in Model (4), as well as the further addition of the free cash flow interaction terms in Model (5), allows for an assessment of how sensitive the main results are to the inclusion of these controls.

4.1.2.2 Heteroskedasticity

A key assumption of OLS regression is that the error term variance is constant across observations, a property known as homoskedasticity (Wooldridge, 2016). Violating this assumption, in which the variance differs systematically across observations, is known as heteroskedasticity. If heteroskedasticity is present, the OLS coefficient estimates remain unbiased, but the standard errors become unreliable, invalidating hypothesis testing (Wooldridge, 2016). In a sample like the one in this study, where firms differ significantly in size, leverage, and deal characteristics, heteroskedasticity is a natural concern. To assess whether the assumption holds, a White's test is conducted on the baseline specification (Model 3), where the null hypothesis of homoskedasticity is rejected if the p-value is less than 0.05 (White, 1980). The results are reported in [Appendix 3](#) and discussed in [Section 5.2.1 White's test](#).

4.1.2.3 Endogeneity

A significant concern in empirical M&A research is the potential for endogeneity, including reverse causality (Roberts & Whited, 2011). In the context of this paper, reverse causality would occur if an acquirer strategically adjusts its capital structure or financial position in direct anticipation of an acquisition announcement. If such adjustments are made, the observed relationship between the acquirer's risk profile and the acquisition premium would be biased by the deal itself.

To mitigate these risks and isolate the impact of the acquirer's pre-existing risk exposure, this study uses several temporal adjustments. First, all firm-level financial metrics, including leverage, ROA and total assets, are measured at the fiscal year-end immediately preceding the acquisition announcement, in line with Moeller et al. (2004) and Lang et al. (1991). By using lagged data, the study ensures that the variables capture the acquirer's financial position as it was observable to the market before any deal-related financing or restructuring occurred.

Secondly, to prevent market risk measures from being influenced by "leakage" or "deal-driven" price movements, the calculation window for stock return volatility ends 20 trading days before the announcement. This 20-day buffer, in line with Meulbroek (1992), ensures that the volatility measure reflects the acquirer's underlying risk profile rather than the market's reaction to the pending transaction.

Finally, while these temporal adjustments reduce the likelihood of reverse causality, it is important to acknowledge that this study does not employ an instrumental variable approach, which would more definitively address endogeneity concerns (Roberts & Whited, 2011). Consequently, the findings are presented as statistically significant associations and should be interpreted as such rather than as definitive causal estimates.

4.2 Robustness

To verify the reliability of the baseline regression results and ensure that the findings are not driven by specific market abnormalities or extreme outliers, robustness checks for H1a, H1b, H2, and H3 are conducted using three primary tests. First, Model (4) and Model (5) are re-estimated after excluding acquirers in the top 5th percentile of stock return volatility. Firms with extremely high stock return volatility are qualitatively different from the rest of the sample. These firms tend to be smaller, financially weaker, and more likely to experience firm-specific distress or speculative trading activity unrelated to the acquisition itself. If these firms also happen to pay unusual premiums, their presence in the sample can pull the estimated volatility coefficient in a direction that does not reflect the relationship for the typical acquirer. By excluding them, the test

assesses whether the baseline results are driven by this small group of extreme observations or hold more broadly across the sample.

Second, to assess whether the results are driven by aggregate market uncertainty rather than firm-specific risk, a robustness test is conducted using the CBOE Volatility Index (VIX). The VIX data is obtained from the Chicago Board Options Exchange (CBOE) and measures the implied volatility of the S&P 500 over the next 30 days, reflecting investor sentiment and market stress (Whaley, 2009; S&P Dow Jones Indices, 2026). For each transaction, the VIX closing level is measured 20 trading days before the announcement date, matching the measurement window used for the firm-level volatility variable (Meulbroek, 1992). In the robustness specification, the VIX replaces year fixed effects, allowing a direct test of whether aggregate market uncertainty accounts for the volatility-premium relationship observed in the baseline models. The test is motivated by Simonyan's (2014) finding that aggregate market volatility is positively associated with acquisition premiums, and by the sensitivity of the firm-level volatility coefficient to the inclusion of year fixed effects in the main specifications.

Third, the models are re-estimated after excluding transactions in the bottom quartile of deal size, to verify that economically marginal transactions do not drive the baseline results. Smaller deals are subject to higher relative transaction costs, less analyst coverage, and less market scrutiny, all of which can affect the relationship between acquirer characteristics and the acquisition premium (Moeller et al., 2004; Fuller et al., 2002). Excluding these transactions ensures that the estimates reflect economically meaningful acquisitions, where the mechanisms studied in this paper are most likely to appear.

5. Empirical Results & Analysis

This chapter presents the study's empirical results. The main regression results are discussed, followed by the interaction analysis, diagnostic tests, and robustness checks.

5.1 Multivariate Analysis

Table 5 presents the results of the five OLS regression models estimated to examine the relationship between acquirer risk exposure and the acquisition premium. The models are built progressively, starting with bivariate specifications for each independent variable before introducing the full set of control and fixed effects in Model (4), and the free cash flow interaction in Model (5). The discussion below focuses on the independent variables in turn, starting with leverage, then stock return, and finally free cash flow. The adjusted R^2 , which measures how much of the variation in acquisition premiums the model explains, is 0.070 in the fully specified model (4). This means that the model explains roughly 7% of the variation in premiums. While modest, this is consistent with findings reported by Simonyan (2014) and Moeller et al. (2004) in comparable cross-sectional settings. This study focuses specifically on acquirer-level risk characteristics. Given that acquisition premiums are also shaped by target characteristics, negotiation dynamics, and other factors beyond the scope of this study, an adjusted R^2 in this range is to be expected and does not reflect a weakness in the model.

5.1.1 Financial Risk and Acquisition Premiums

The coefficient on leverage is negative across all model specifications, ranging from -9.247 in the bivariate Model (1) to -6.590 in the fully specified Model (4), which includes the complete set of control variables along with year and industry fixed effects, as reported in *Table 5*.

However, the coefficient for leverage is not statistically significant at conventional levels in Models (1), (3), or (4), and this study therefore does not find support for either H1a or H1b in the baseline analysis.

The absence of a significant leverage effect on the acquisition premium is consistent with a broader pattern in the empirical framework. Moeller et al. (2004), despite working with a large sample of US transactions, explicitly report an insignificant leverage coefficient, a result they themselves describe as surprising given prior evidence. Additionally, Baker et al. (2012) similarly find no significant relationship in their premium regressions. Where significant effects have been documented, as in Maloney et al. (1993), these tend to come from samples focused on specific deal types and earlier time periods, which may limit how well the findings generalise to a broad sample of public-to-public transactions spanning 25 years. The fact that leverage remains insignificant across Models (1), (3), and (4), as controls and fixed effects are progressively added, further suggests that this is not a result that disappears or appears depending on how the model is specified.

Although the coefficient never reaches significance, its consistently negative sign across all baseline models remains meaningful. It points in the direction predicted by the debt disciplining hypothesis, suggesting that the underlying logic of Jensen (1986) is present but not strong enough to dominate in a sample of this breadth. The question is why, and three interconnected reasons help explain this.

The first concerns the governance environment. Since this sample consists entirely of public-to-public transactions, both acquirers and targets already operate under intense scrutiny from institutional investors, analysts, and the board of directors. Masulis et al. (2007) show that in such settings, these external governance mechanisms can substitute for the disciplining role of debt. When managers are already concerned with multiple channels simultaneously, the incremental contribution of leverage to their bidding behaviour becomes difficult to isolate and, in a regression, to detect. This interpretation is also consistent with the empirical evidence of Hayward and Hambrick (1997), who show that strong board vigilance and monitoring can moderate managerial behavioural biases and reduce the tendency to overpay in acquisitions.

The second reason lies in the competing incentives that leverage creates. As reflected in the competing hypotheses (H1a and H1b), the theoretical predictions point in opposite directions. Jensen (1986) predicts that debt reduces free cash flow and constrains overpayment, while

Jensen and Meckling (1976) argue that highly leveraged firms face risk-shifting incentives that could lead managers to bid more aggressively and pay higher premiums. Stulz (1990) provides further context, showing that the relationship between leverage and managerial decisions is fundamentally non-linear. Moderate leverage disciplines managers, but excessive leverage can lead to underinvestment as managers are forced to service debt rather than pursue value-creating deals. Across the sample of 1,654 heterogeneous transactions, these opposing forces likely operate simultaneously in different parts of the distribution, and a single linear OLS coefficient captures only their average, which may be close to zero even if the individual mechanisms each operate as predicted.

Third, the 25-year sample window covers significant structural changes in the credit market. The long period of historically low interest rates following the 2008 financial crisis made debt cheaper, which likely reduced its effectiveness as a binding constraint on managers. Although the regression includes year fixed effects to control for time-varying macroeconomic conditions, these variables only adjust for annual shifts in the average premium level. They do not capture changes in the underlying relationship between leverage and bidding behaviour over time. If years of cheap credit fundamentally altered how managers respond to debt, year fixed effects cannot absorb this shift in behaviour, further explaining the weak baseline result.

Taken together, these results show that, rather than reflecting an empirical shortcoming, they show how large, publicly listed acquirers actually operate. For the average firm in this sample, leverage is one of many governance pressures that simultaneously shape acquisition decisions. In that context, its marginal effect on the premium paid is simply too small to detect, a result that aligns with findings from Moeller et al. (2004) and Baker et al. (2012) in their respective samples.

That said, once free cash flow is introduced into Model (5), the leverage coefficient becomes significant among cash-poor acquirers. This is further discussed in *Section 5.1.3 Free Cash Flow and Acquisition Premium*. However, for the broad sample of public-to-public transactions, leverage does not systematically determine the premium paid, and this is the result that this study stands behind.

5.1.2 Market Risk and Acquisition Premiums

The results for stock return volatility tell a more nuanced story than the leverage results, and are worth examining in more detail. The coefficient ranges from -0.048 in the bivariate model (2) to 0.010 in the fully specified Model (4), which includes the complete set of control variables alongside year and industry fixed effects as reported in *Table 5*. The coefficient does not reach statistical significance at conventional levels in either specification, and the baseline analysis therefore does not support H2.

This finding is consistent with a broader pattern in the literature. Simonyan (2014), whose empirical design is close to this study, finds that the relationship between acquirer volatility and premiums weakens considerably once aggregate market conditions are controlled for, and attributes much of the apparent volatility effect to time-varying factors rather than the firm-specific risk. The fact that the volatility coefficient is insignificant in both the bivariate Model (2) and the fully specified Model (4) suggests that the absence of a significant result here is not a consequence of any particular modelling choice, but reflects something more fundamental about how volatility relates to premiums in a large, diverse sample.

To understand why, it helps to think about what stock return volatility actually measures in this context. A firm's volatility does not exist in isolation; instead, it rises and falls with the market around it. During the financial crisis of 2008-2009 or the COVID-19 pandemic, firms across industries saw their volatility rise simultaneously; meanwhile, acquisition premiums also shifted due to credit constraints, investor sentiment, and deal activity, rather than anything specific to individual acquirers. Without year fixed effects, a regression picks up this co-movement and attributes it to firm-level volatility, yielding a coefficient that appears meaningful but largely reflects the market environment. Once year and industry fixed effects are introduced in Model (4), and that shared variation is absorbed, the relationship disappears.

Additionally, certain industries are structurally more volatile than others, and those same industries may pay higher or lower premiums for reasons unrelated to acquirer risk. For instance, a technology firm and a healthcare firm can look completely different in terms of stock return volatility simply because of the nature of their businesses, not because of their bidding

behaviour. Without industry fixed effects, a regression cannot separate the two, and volatility ends up absorbing patterns that are just reflections of the industry in which a deal takes place. Once Model (4) controls for this, that source of variation is removed as well.

Despite this, none of the above means that the reasoning behind H2 is flawed. Myers and Majluf (1984) argue that target shareholders demand higher premiums when they are uncertain about the true value of the acquirer's offer, and Roll (1986) and Hayward and Hambrick (1997) show that overconfident managers tend to overpay. Both arguments are well-grounded and likely hold in specific transactions. But a volatile acquirer in the technology sector during the financial crisis looks very different from one in healthcare during a calm market period, and a single coefficient across 1,654 deals and 25 years cannot capture that distinction. Once year and industry fixed effects account for those differences, the relationship with the premium disappears. Furthermore, although Hayward and Hambrick (1997) document a strong positive relationship between managerial overconfidence and acquisition premiums, firm-level stock return volatility may be too broad a proxy to capture the more idiosyncratic behavioural drivers of overconfidence, such as media attention or relative executive compensation. Consistent with this interpretation, the results suggest that, for the broad cross-section of public acquirers studied here, stock return volatility does not systematically explain variation in acquisition premiums. This interpretation is further examined in Section 5.3 Robustness Tests, which assess whether the volatility effect differs across periods of high and low aggregate market uncertainty.

Table 5: Regression Results

	(1) Model 1	(2) Model 2	(3) Model 3	(4) Model 4	(5) Model 5
Leverage	-9.247 (7.057)		-5.331 (7.269)	-6.59 (7.979)	-19.972** (9.958)
Volatility		-.048 (.052)	.15** (.067)	.01 (.077)	-.021 (.086)
Return on Assets			15.166* (8.816)	11.493 (9.014)	12.719 (9.575)
Log of Total Assets			.626 (.783)	-.4 (.808)	-.354 (.801)
Tobin's Q			.741 (.845)	.439 (.876)	.681 (.895)
Relative Deal Size			-6.264*** (2.314)	-4.844** (2.367)	-4.73** (2.381)
Stock Dummy			-7.36** (3.302)	-7.901** (3.44)	-7.896** (3.46)
Tender Dummy			15.147*** (2.741)	14.764*** (2.814)	14.846*** (2.828)
Cross-Border Dummy			5.535* (2.993)	5.061* (3.003)	4.75 (3.033)
Diversifying Dummy			-7.029*** (2.461)	-6.02** (2.527)	-5.796** (2.536)
Cash-Rich Indicator					-11.413* (6.821)
Lev*Cash-Rich					31.746** (15.124)
Vol*Cash-Rich					.033 (.118)
Intercept	50.452*** (2.04)	50.377*** (2.317)	32.672** (13.555)	68.635*** (18.521)	74.308*** (18.731)
Observations	1654	1654	1654	1654	1654
Adj. R ²	.001	.000	.052	.070	.072
Year FE	No	No	No	Yes	Yes
Industry FE	No	No	No	Yes	Yes

Table 5 reports OLS regression results. All models are estimated with heteroskedasticity-robust standard errors. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

5.1.3 Free Cash Flow and Acquisition Premium

To formally test whether free cash flow moderates the relationship between acquirer risk exposure and acquisition premiums, *Table 6* reports results from an interaction model that tests H3. The model introduces interaction terms between the independent variables and a cash-rich indicator in addition to the constituent terms. The model includes the full set of control variables, year fixed effects, and industry fixed effects, extending the main specification in Model (4).

The coefficient on *Leverage* in Column (3) in *Table 6* captures the effect for cash-poor firms and is negative and statistically significant at the 5% level (-19.972). This indicates that among cash-poor acquirers, higher leverage is associated with significantly lower premiums, consistent with the debt disciplining hypothesis (Jensen, 1986). It is worth noting that this effect was undetectable in the full-sample baseline regressions reported in *Table 5*, where leverage was consistently insignificant. The interaction framework suggests that this insignificance reflects two offsetting effects across the subgroups, one for cash-rich firms and one for cash-poor firms, that cancelled each other out in the pooled sample.

The interaction term *Leverage * Cash-Rich* is positive and significant at the 5% level (31.746), confirming that the disciplining effect of leverage is significantly weaker for cash-rich firms. The total leverage effect for cash-rich acquirers, computed as the sum of the baseline and interaction coefficients ($-19.972 + 31.746 = 11.774$), is positive. This indicates that leverage has no constraining effect on bidding behaviour when acquirers have abundant internal resources. In the context of this paper, the pattern is consistent with the theoretical prediction that debt disciplines overpayment since it is used to service obligations and reduces the cash available for managerial discretion. But when firms can fund acquisitions with internal resources regardless of their leverage, the disciplining effect is less binding. A highly leveraged cash-rich acquirer can still bid aggressively because the debt does not limit the resources available for the transaction in a meaningful way. However, a highly leveraged but cash-poor acquirer faces a genuine constraint. Debt obligations absorb cash that would otherwise be available for bidding, and creditor monitoring further limits the manager's ability to overpay. This is precisely the pattern documented by the interaction model.

The *Cash-Rich Indicator* coefficient is negative and significant at the 10% level (-11.413), indicating that cash-rich acquirers pay lower premiums on average than cash-poor acquirers, holding all else equal. This finding does not align with Jensen's (1986) prediction that firms with abundant free cash flow are more likely to overpay. Rather than exhibiting agency-driven overpayment, cash-abundant managers in this sample may use their financial flexibility to negotiate premiums more closely aligned with the baseline synergy realisation metrics. One interpretation is that financial strength provides bargaining power or signals credibility to target firms. A cash-rich acquirer may be perceived as a more reliable counterparty, particularly in transactions where certainty of deal completion matters to target shareholders, and this credibility may reduce, rather than increase, the premium needed to close the transactions.

For volatility, the baseline coefficient is small and insignificant (-0.021), and the interaction term *Volatility * Cash-Rich* is similarly insignificant (0.033). This indicates that the volatility-premium relationship is not formally moderated by free cash flow. This is consistent with the main finding from Model (4) that firm-level volatility does not independently predict premiums once aggregate and industry-level conditions are controlled for. If volatility does not matter in the full sample, there is little reason to expect it to matter differentially across cash-rich and cash-poor firms.

The interaction results, therefore, provide partial support for H3. The leverage-premium relationship is formally moderated by free cash flow, with debt serving as a disciplining mechanism on bidding behaviour among cash-poor firms but not among cash-rich firms. This result adds nuance to the insignificant leverage effect in Model (4). The effect is not absent but rather conditional on the firm's access to internal resources. However, the volatility-premium relationship is not moderated by free cash flow, consistent with the broader conclusion that firm-level volatility does not systematically determine premiums in this sample. Taken together, these findings suggest that the role of free cash flow in acquisition pricing is primarily as a moderator of the leverage-premium relationship, consistent with the disciplining effect of debt proposed by Jensen (1986), rather than as a broad amplifier of all dimensions of acquirer risk.

Table 6: H3 Interaction Analysis

	(1) No FE	(2) Year FE	(3) Year + Industry FE
Leverage	-19.709** (9.494)	-18.514* (9.781)	-19.972** (9.958)
Volatility	.111 (.078)	-.018 (.085)	-.021 (.086)
Cash-Rich Indicator	-12.494* (6.784)	-11.414* (6.798)	-11.413* (6.821)
Lev*Cash-Rich	33.509** (14.788)	30.580** (15.031)	31.746** (15.124)
Vol*Cash-Rich	.067 (.118)	.027 (.118)	.033 (.118)
Return on Assets	15.68* (9.27)	13.634 (9.459)	12.719 (9.575)
Log of Total Assets	.654 (.777)	-.332 (.803)	-.354 (.801)
Tobin's Q	.955 (.860)	.771 (.893)	.681 (.895)
Relative Deal Size	-6.105*** (2.323)	-4.760** (2.343)	-4.730** (2.381)
Stock Dummy	-7.312** (3.331)	-8.781** (3.424)	-7.896** (3.46)
Tender Dummy	15.246*** (2.75)	14.579*** (2.799)	14.846*** (2.828)
Cross-Border Dummy	5.263* (3.003)	4.910 (2.984)	4.750 (3.033)
Diversifying Dummy	-6.650*** (2.481)	-6.086** (2.449)	-5.796** (2.536)
Intercept	38.046*** (14.217)	64.892*** (16.084)	74.308*** (18.731)
Observations	1654	1654	1654
Adj. R ²	.054	.071	.072
Year FE	No	Yes	Yes
Industry FE	No	No	Yes

Table 6 reports OLS regression results from the interaction model testing H3 with interaction terms Leverage * Cash-Rich and Volatility * Cash-Rich. Column (1) excludes year fixed effects, Column (2) includes year fixed effects, Column (3) includes year and industry fixed effects. All models are estimated with heteroskedasticity-robust standard errors. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

5.1.4 Control Variables and Acquisition Premium

The control variable coefficients reported in *Table 5* display consistent patterns across specifications. In Model (4), the *Tender Offer* dummy is positive and highly significant (14.764, $p < 0.01$), confirming that tender offers require substantially higher premiums to incentivise dispersed shareholders to tender, consistent with Walkling and Edmister (1985). The *Stock Payment* dummy is negative and significant (-7.901, $p < 0.05$), with stock-financed deals associated with premiums roughly 8 percentage points lower than non-stock deals. This result contradicts the signalling prediction (Myers & Majluf, 1984) outlined in Section 2.2.4 *Information Asymmetry and Signalling*, which suggests that target shareholders should demand higher premiums to compensate for the risk of receiving overvalued equity. A possible explanation for this negative relationship, as suggested by the *Relative Deal Size* findings, is that these transactions may involve acquirers with stronger bargaining power, enabling them to negotiate lower premiums. However, the dominance of cash deals in the sample, accounting for 57.6% of all transactions, remains consistent with the broader signalling framework (Myers & Majluf, 1984), suggesting that the majority of acquirers believe their equity is not overvalued at the time of the acquisition.

Furthermore, the *Diversifying Deal* dummy is negative and significant (-6.020, $p < 0.05$), suggesting that acquisitions across industry boundaries are associated with lower premiums, likely reflecting lower expected synergies. This aligns with the theory outlined in Section 2.1 *Acquisition Premium: Synergies and Overpayment*, indicating that when expected synergies are lower, acquirers rationally scale back the premiums they are willing to offer. *Relative Deal Size* is negative and significant (-4.844, $p < 0.05$), contrary to the positive sign reported by Moeller et al. (2004), potentially reflecting better bargaining power in larger relative deals. The *Cross-Border* dummy is positive and marginally significant (5.061, $p < 0.10$), and ROA is positive but insignificant (11.493). *Log of Total Assets* and *Tobin's Q* remain insignificant, consistent with the mixed findings in prior literature (Moeller et al., 2004; Baker et al., 2012).

5.2 Diagnostic Tests

5.2.1 White's Test

As shown in [Appendix 3](#), White's test yields a test statistic of 147.72 with a p-value of 0.000, which in turn means that the null hypothesis of homoskedasticity is rejected. To address this, all models in the study are estimated with heteroskedasticity-robust standard errors, a standard practice in other cross-sectional studies (Moeller et al., 2004; Alexandridis et al., 2012; Simonyan, 2014).

5.2.2 Ramsey RESET Test

To assess whether the model is correctly specified in functional form, a Ramsey RESET test is conducted on the baseline specification (Model 3). The null hypothesis is that the model has no omitted variables. As reported in [Appendix 4](#), the test yields a test statistic of 0.97 with a p-value of 0.408, meaning that the null hypothesis cannot be rejected. This suggests that the linear specification is appropriate and that there is no evidence of omitted non-linear relationships between the dependent and independent variables.

5.3 Robustness Tests

To verify the reliability of the baseline results, the main regression models are re-estimated under three alternative specifications. [Table 7](#) reports the results for H1a, H1b, and H2, while [Table 8](#) reports the corresponding results for the H3 interaction model.

5.3.1 Financial Risk and Acquisition Premiums

The *Leverage* coefficient is negative and insignificant across Columns (1) - (3) in [Table 7](#), consistent with the baseline findings. However, when transactions in the bottom quartile of deal size are excluded in Column (4), *Leverage* becomes strongly negative (-20.050) and significant at the 1% level. This is the strongest *Leverage* result observed in the study and suggests that the disciplining effect of debt is strongest for larger, economically meaningful transactions, where

capital structure constraints are more likely to bind. The insignificant baseline results may therefore partly reflect the diluting influence of small deals, in which the acquisition premium is less sensitive to the acquirer's financial characteristics. This finding provides partial support for the debt disciplining hypothesis (Jensen, 1986), which was undetectable in the full-sample baseline.

5.3.2 Market Risk and Acquisition Premiums

The *Volatility* coefficient is small and insignificant across all four robustness specifications in [Table 7](#). This is consistent with the main Model (4) result, where volatility lost significance once year and industry fixed effects were introduced. The VIX test in Column (2) gives additional insight into this finding. When the VIX replaces year fixed effects, the *VIX* coefficient is positive and highly significant (0.957, $p < 0.01$) while the firm-level *Volatility* coefficient remains insignificant (0.044). This suggests that aggregate market uncertainty, rather than firm-specific risk, is the relevant channel through which volatility-related factors influence acquisition premiums, consistent with Simonyan (2014). Consequently, the valuation error described by Roll (1986) as the winner's curse, where the winning bidder overestimates the target's value the most, appears to be driven by systematic, market-wide macroeconomic uncertainty rather than an isolated, firm-specific error. The result from Column (3), where acquirers in the top 5th percentile of volatility are excluded, further confirms that extreme observations do not drive the insignificance of firm-level volatility. Overall, the robustness tests support the conclusion from the main analysis that acquirer stock return volatility does not, after accounting for aggregate market conditions and industry differences, independently predict acquisition premiums.

Table 7: Robustness Tests - H1a, H1b, and H2

	(1) Model 4	(2) VIX Control	(3) Excl. High Vol	(4) Excl. Small Deals
Leverage	-6.59 (7.979)	-4.354 (7.304)	-7.202 (7.548)	-20.05*** (6.111)
Volatility	.010 (.077)	.044 (.067)	.034 (.091)	-.014 (.072)
Return on Assets	11.493 (9.014)	12.827 (8.95)	2.859 (12.151)	-29.793* (15.973)
Log Total Assets	-.400 (.808)	.419 (.781)	-.312 (.830)	1.265 (.84)
Tobin's Q	.439 (.876)	.71 (.859)	.103 (.923)	1.560 (.968)
Relative Deal Size	-4.844** (2.367)	-5.061** (2.338)	-6.432*** (2.301)	-3.249 (2.005)
Stock Dummy	-7.901** (3.44)	-6.97** (3.324)	-7.438** (3.629)	-7.783** (3.496)
Tender Dummy	14.764*** (2.814)	13.609*** (2.757)	14.576*** (2.847)	17.572*** (2.783)
Cross-Border Dummy	5.061* (3.003)	5.699* (2.997)	5.569* (3.025)	.557 (2.612)
Diversifying Dummy	-6.02** (2.527)	-6.536*** (2.517)	-4.421* (2.580)	-6.651*** (2.449)
VIX_20d		.957*** (.196)		
Intercept	68.635*** (18.521)	29.446* (16.745)	67.394*** (19.281)	46.667** (18.761)
Observations	1654	1654	1572	1241
Adj. R ²	.070	.074	.066	.126
Year FE	Yes	No	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes

Table 7 reports robustness checks for H1a, H1b, and H2. Column (1) reproduces the baseline Model (4) results with year and industry-fixed effects. Column (2) replaces year fixed effects with the CBOE Volatility Index (VIX), measured 20 trading days before the announcement, as a direct control for aggregate market uncertainty, retaining industry fixed effects. Column (3) excludes acquirers in the top 5th percentile of stock price volatility. Column (4) excludes transactions in the bottom quartile of deal size. Heteroskedasticity-robust standard errors are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

5.3.3 Free Cash Flow and Acquisition Premiums

Table 8 reports robustness checks for the H3 interaction model. The key finding from the main analysis, that the *Leverage * Cash-Rich* interaction is positive and significant, is largely robust across all specifications. The interaction term remains significant at the 5% level when the VIX is introduced in Column (2) (34.519, $p < 0.05$) and at the 10% level when high-volatility acquirers are excluded in Column (3) (25.602, $p < 0.10$). This confirms that the moderating role of free cash flow in the leverage-premium relationship is not driven by aggregate market conditions or extreme volatility observations.

The baseline *Leverage* coefficient for cash-poor firms is negative and significant across Columns (1) through (3), ranging from -18.218 to -19.972, consistent with the debt disciplining interpretation. When small deals are excluded in Column (4), the leverage coefficient for cash-poor firms strengthens significantly (-27.263, $p < 0.01$), reinforcing the findings from *Table 7* that leverage is most influential in larger transactions. However, the interaction term in Column (4) drops to 15.277 and loses significance, suggesting that the distinction between cash-rich and cash-poor firms becomes less evident when restricting the sample to larger deals. This may indicate that, in larger transactions, other governance mechanisms, such as board oversight and advisor involvement, substitute for the moderating role of free cash flow.

The *Volatility * Cash-Rich* interaction remains small and insignificant across all robustness specifications, consistent with the main interaction analysis and the VIX robustness test, confirming that market risk does not differentially affect premiums for cash-rich and cash-poor acquirers.

Overall, the robustness tests confirm the study's main findings. First, leverage is insignificant in the full sample but becomes a significant negative predictor when small deals are excluded, providing conditional support for the study's hypothesis H1a and consistent with the debt disciplining hypothesis. Second, firm-level volatility does not independently predict premiums after controlling for aggregate conditions, with the VIX test confirming that market-wide uncertainty is the relevant channel. Third, free cash flow formally moderates the leverage-premium relationship, with the interaction effect remaining robust when controlling for the VIX and excluding high-volatility observations.

Table 8: Robustness Tests - H3

	(1)	(2)	(3)	(4)
	Model 5	VIX Control	Excl. High Vol	Excl. Small Deals
Leverage	-19.972** (9.958)	-19.265** (9.598)	-18.218* (10.508)	-27.263*** (8.45)
Volatility	-.021 (.086)	.006 (.079)	0 (.111)	.024 (.092)
Cash-Rich Indicator	-11.413* (6.821)	-12.836* (6.624)	-9.274 (7.027)	-1.815 (6.144)
Lev * Cash-Rich	31.746** (15.124)	34.519** (14.605)	25.602* (14.297)	15.277 (12.48)
Vol * Cash-Rich	.033 (.118)	.058 (.114)	.045 (.14)	-.11 (.108)
Return on Assets	12.719 (9.575)	13.791 (9.434)	3.789 (13.051)	-24.555 (16.125)
Log of Total Assets	-.354 (.801)	.439 (.775)	-.277 (.825)	1.196 (.836)
Tobin's Q	.681 (.895)	.958 (.877)	.32 (.949)	1.584 (.974)
Relative Deal Size	-4.73** (2.381)	-4.917** (2.349)	-6.331*** (2.305)	-3.289 (2.023)
Stock Dummy	-7.896** (3.46)	-6.957** (3.346)	-7.266** (3.628)	-7.496** (3.497)
Tender Dummy	14.846*** (2.828)	13.736*** (2.764)	14.532*** (2.86)	17.737*** (2.792)
Cross-Border Dummy	4.75 (3.033)	5.353* (3.022)	5.432* (3.058)	.309 (2.619)
Diversifying Dummy	-5.796** (2.536)	-6.203** (2.531)	-4.212 (2.611)	-6.716*** (2.461)
VIX_20d		.967*** (.194)		
Intercept	74.308*** (18.731)	35.272** (17.05)	72.244*** (19.863)	48.818** (19.249)
Observations	1654	1654	1572	1241
Adj. R ²	.073	.077	.067	.126
Year FE	Yes	No	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes

Table 8 reports robustness checks for the H3 interaction model. Column (1) reproduces the baseline Model (5) results with year and industry fixed effects. Column (2) replaces year fixed effects with the VIX, retaining industry fixed effects. Column (3) excludes acquirers in the top 5th percentile of stock price volatility. Column (4) excludes transactions in the bottom quartile of deal size. Heteroskedasticity-robust standard errors are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

6. Conclusion

This chapter concludes the study by summarising the main findings, discussing their implications for theory and practice, and acknowledging limitations and potential for future research.

The purpose of the study is to examine how an acquirer's risk exposure affects the acquisition premium paid in public-to-public corporate acquisitions. Specifically, the study seeks to answer the overarching research question: *Does acquirer risk exposure, measured by financial risk (leverage) and market risk (stock return volatility), affect the acquisition premium, and does the level of managerial discretion (free cash flow) moderate these relationships?* The hypotheses are built on competing theoretical frameworks, including the debt disciplining hypothesis (Jensen, 1986; Stulz, 1990; Lang et al., 1991), the asset substitution hypothesis (Jensen & Meckling, 1976), the hubris hypothesis (Roll, 1986), and the information asymmetry framework (Myers & Majluf, 1984).

Addressing the first part of the research question, the baseline results show no statistically significant independent relationship between an acquirer's risk exposure and the acquisition premium. Based on Model (4), the primary specification, this study concludes that neither leverage nor stock return volatility has a significant independent effect on the premium paid by the average public acquirer. The insignificant leverage results in the baseline model are consistent with Moeller et al. (2004) and Baker et al. (2012) and likely reflect the simultaneous operation of competing mechanisms: debt discipline pulling premiums down while risk-shifting incentives push them up, producing a net effect that is indistinguishable from zero in this study's full sample. While the main model yields insignificant overall results, robustness tests in [Table 7](#) reveal that the disciplining effect of leverage becomes highly significant when restricting the sample to larger transactions, providing partial support for the debt disciplining hypothesis in those specific settings. The insignificant volatility results, confirmed by the VIX robustness test, indicate that firm-level stock return volatility does not independently predict premiums once aggregate market conditions and industry differences are accounted for. The VIX itself is

positive and highly significant, confirming that market-wide uncertainty, rather than firm-specific risk, shapes acquisition pricing in this respect.

However, the most notable finding of this study comes from the interaction analysis testing H3. While leverage appears irrelevant in the full sample, the interaction model reveals that this insignificance masks two distinct, opposing effects. Among cash-poor acquirers, leverage is negative and significant, consistent with the debt disciplining hypothesis: debt obligations absorb resources that would otherwise be available for bidding, and creditor monitoring constrains managers' ability to overpay. Among cash-rich acquirers, this disciplining effect disappears entirely. The interaction term *Leverage * Cash-Rich* is positive and significant at the 5% level, indicating that when firms have abundant internal resources, leverage ceases to function as a binding constraint on bidding behaviour. This finding is robust to the inclusion of the VIX and the exclusion of high-volatility observations, consistent with the theoretical prediction that debt disciplines overpayment only when it meaningfully reduces discretionary cash flow (Jensen, 1986). By contrast, the volatility-premium relationship is not moderated by free cash flow, suggesting that financial risk and market risk operate through different channels in acquisition pricing. Ultimately, in answer to the research question, the acquisition premium is neither truly bound by the acquirer's financial risk nor driven by the broader market; instead, it depends on whether the acquirer has the internal resources to circumvent the constraints that debt imposes.

This conditional relationship represents a central contribution of the study. It shows that treating the acquirer's risk exposure as a single dimension overlooks important variations in the relationships between leverage, volatility, and premiums. While the impact of leverage is highly dependent on a firm's access to internal resources, firm-level volatility plays no significant role in determining the premium. Together, these findings yield important practical implications. For target shareholders and boards assessing a bid, the acquirer's capital structure is informative about bidding discipline only when the acquirer is financially constrained. For acquirer shareholders and governance bodies, the results suggest that monitoring mechanisms centred on leverage are most effective when internal resources are limited, and that alternative governance instruments may be needed to constrain cash-rich acquirers.

However, the study's findings must be interpreted in light of several limitations. The analysis is restricted to public-to-public transactions involving US targets, which limits the generalisability of the results to other transaction types and geographies. The relatively low explanatory power of the models, while consistent with prior cross-sectional studies of the acquisition premium (Simonyan, 2014), suggests that acquisition premiums are shaped by a broad set of factors beyond the acquirer characteristics examined here. Furthermore, as this study does not employ an instrumental variable approach, the results should be interpreted as associations rather than causal estimates (Roberts & Whited, 2011).

For future research, extending the analysis to non-US markets or private transactions would allow for a broader assessment of whether the findings generalise beyond the US public M&A market. Incorporating direct measures of managerial overconfidence, such as CEO option-holding behaviour following Malmendier and Tate (2005, 2008), could help distinguish between the behavioural and agency explanations identified in this study. Perhaps most importantly, the asymmetric pattern observed in the H3 analysis, whereby leverage constrains cash-poor firms but not cash-rich firms, suggests that the relationship between acquirer risk and managerial discretion warrants further investigation. Exploring these interactions in greater depth could improve both theoretical insights into bidding behaviour and the development of governance mechanisms designed to reduce value-destroying acquisitions.

Appendix

Appendix 1: Variable Definitions

Variable	Definition
Panel A: Dependent Variable	
Acquisition Premium	<p>The percentage difference between the offer price per share and the target's share price four weeks before the announcement date.</p> $(1) \frac{\text{Offer Price}_i - \text{Target Price}_i, 4 \text{ weeks prior}}{\text{Target Price}_i, 4 \text{ weeks prior}}$
Panel B: Explanatory Variables	
Leverage	<p>Total debt divided by total assets, measured at the fiscal year-end preceding the announcement.</p> $(2) \frac{\text{Total Debt}_i}{\text{Total Assets}_i}$
Stock Return Volatility	<p>Annualised standard deviation of daily stock returns over 252 trading days ending 20 days before the announcement date.</p> $(3) \text{Volatility}_i = \sigma(r_i) * \sqrt{252}$
Free Cash Flow	<p>EBITDA minus taxes, interest expense, and dividends paid, scaled by total assets for the fiscal year preceding the announcement date.</p> $(4) \frac{\text{EBITDA}_i - \text{Taxes}_i - \text{Interest Expense}_i - \text{Dividends Paid}_i}{\text{Total Assets}_i}$

Cash-Rich Indicator	<p>Dummy variable equal to 1 if the acquirer's free cash flow is above the sample median, 0 otherwise. Acquirers below the median (cash-poor) serve as the reference point.</p> <p>1 = <i>Cash Rich</i>, 0 otherwise</p>
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Panel C: Control Variables	
Return on Assets (ROA)	<p>Net income divided by total assets, measured at fiscal year-end preceding the acquisition announcement.</p> $(5) \frac{Net\ Income_i}{Total\ Assets_i}$
Size of Acquiring Company	<p>Natural logarithm of acquirer's total assets, measured at fiscal year-end preceding the acquisition announcement.</p> $(6) \text{Log}(Total\ Assets)_i$
Tobin's Q	<p>Market capitalisation plus book value of debt divided by book value of total assets, at the fiscal year-end before the announcement.</p> $(7) \frac{Market\ Capitalization_i + Book\ value\ of\ Debt_i}{Book\ Value\ of\ Total\ Assets_i}$
Relative Deal Size	<p>Total transaction value divided by the acquirer's market capitalisation at the fiscal year-end preceding the announcement.</p> $(8) \frac{Transaction\ Value_i}{Market\ Capitalization_i}$
Method of Payment	Dummy variable equal to 1 if the acquisition

	<p>is entirely financed with stock, 0 otherwise. Mixed and cash payments serve as the reference point.</p> <p>1 = <i>Stock</i>, 0 otherwise</p>
Tender Offer	<p>Dummy variable equal to one if the acquisition is structured as a tender offer and zero otherwise.</p> <p>1 = <i>Tender Offer</i>, 0 otherwise</p>
Cross-Border Transactions	<p>1 = <i>Acquirer and target domiciled in different countries</i>, 0 otherwise</p>
Diversifying Acquisitions	<p>1 = <i>Acquirer and target in different two – digit SIC code industries</i>, 0 otherwise</p>

Panel D: Robustness Variables	
VIX	<p>The CBOE Volatility Index, measuring the implied volatility of the S&P 500 over the next 30 days, reflecting investor sentiment and market stress. Measured at the closing level 20 trading days before the announcement date.</p> <p>(9) VIX_{20d}</p>

Appendix 1 defines all variables used in the regression analysis. All acquirer financial data is measured for the fiscal year immediately preceding the acquisition announcement. Continuous variables except Log(Assets) are winsorized at the 1st and 99th percentiles.

Appendix 2: Baseline Model Specifications

(1) Bivariate Model - Financial Risk

$$Premium_i = \beta_0 + \beta_1 Leverage_i + \epsilon_i$$

(2) Bivariate Model - Market Risk

$$Premium_i = \beta_0 + \beta_1 Volatility_i + \epsilon_i$$

(3) Multivariate Model - Full Controls, No Fixed Effects

$$Premium_i = \beta_0 + \beta_1 Leverage_i + \beta_2 Volatility_i + \beta_k Controls_{k,i} + \epsilon_i$$

Appendix 3: White's Test for Heteroskedasticity

H0: Homoskedasticity			
Ha: Unrestricted heteroskedasticity	Test value	P	Decision
Model 3	147.72	0.000	Reject H0

Appendix 4: Ramsey RESET Test

H0: Model has no omitted variables			
Ha: Model has omitted variables	Test Value	P	Decision
Model 3	0.97	0.408	Fail to reject H0

Appendix 5. AI Contribution Statement

In accordance with Lund University's Policy on Principles for the Use of Generative AI, the authors declare that generative AI tools, specifically Claude and Grammarly, were used during the preparation of this paper. These tools were utilised strictly as a support function to resolve spelling and grammatical errors, eliminate textual repetitions, and refine the structural flow and conciseness of the prose. Additionally, Claude was used to obtain technical guidance and troubleshooting tips on econometric commands in Stata, with these interventions primarily affecting Section 4 (Methodology), 5 (Empirical Results & Analysis), and 6 (Conclusion). Generative AI has therefore only been used as a supplementary aid, and the authors have independently designed all core conceptual arguments, interpretations, and written text. Furthermore, the authors retain full responsibility for the content of this thesis, ensuring its accuracy, authenticity, and academic integrity.

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