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Financial Flexibility and Acquisition Performance: The Strategic Role of Underleveraging

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Professor Fábio Duarte

Professor José Matos

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Disclaimer

This study reflects the final stage of a research process that evolved through multiple rounds of academic discussion, review, and refinement.

An earlier version of this work was accepted for presentation at the GLOBAFA Conference, held in Madrid, Spain, on 29th and 30th May 2026. The opportunity to present the research in an international academic setting provided valuable feedback on its theoretical foundations, empirical design, and interpretation of the results.

The present version incorporates not only the guidance and recommendations provided by Professor Fábio Duarte and Professor José Matos, but also insights and constructive comments received during the conference discussion. These contributions motivated further methodological clarifications, additional robustness analyses, refinements to the empirical specification, and revisions to the interpretation of the findings.

As a result, the current version differs from the conference submitted version in several respects and should be regarded as the definitive version of the study. It reflects the cumulative outcome of the supervision process, the conference discussion, and the subsequent revisions undertaken by me. Responsibility for the final content, interpretation, and any remaining limitations rests solely with me.

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Finally, to myself. Thank you for not giving up. And for that, I will always be proud.

Abstract

We examine whether acquisition outcomes for underleveraged acquirers depend on the direction or the continuous extent of target leverage deviations from optimal capital structure. Prior work establishes that acquirers strategically preserve debt capacity before deals and that target capital structure shapes post-acquisition performance but has not separated these two dimensions of misalignment. We assemble a sample of 226 completed acquisitions undertaken by underleveraged publicly listed acquirers between 2014 and 2024, with strong Asia-Pacific representation. Target leverage is estimated following Frank and Goyal (2009), and performance is assessed through announcement-period cumulative abnormal returns (CARs), buy-and-hold abnormal returns (BHARs) over horizons up to 36 months, and post-deal changes in ROA and Tobin's Q. We find no evidence that target leverage is priced at announcement: neither the directional indicator nor the continuous deviation measure explains short-run returns, and a headline-sentiment diagnostic confirms this is not a narrative-information artefact. Over longer horizons, the picture is more differentiated. Evidence from the extended specifications suggests that larger target leverage deviations are associated with stronger 36-month buy-and-hold abnormal returns, although this relationship is not observed uniformly across specifications, whereas the binary directional indicator adds little incremental explanatory power at this horizon. In the valuation-based specifications (ΔTobin's Q), both the continuous deviation and the binary indicator attain significance, and the binary indicator enters the ΔROA extended model with marginal significance. Overall, the findings suggest that the relevance of target leverage misalignment depends on both how it is measured and the performance dimension considered. This pattern is consistent with the deployment of acquirer financial flexibility to refinance and restructure overleveraged targets, with value accruing gradually through post-acquisition capital structure adjustment. Taken together, the findings suggest that distinguishing between the continuous and directional dimensions of target leverage misalignment may provide additional insights into post-acquisition performance.

Keywords: Mergers and acquisitions; Capital structure; Financial flexibility; Underleveraging; Leverage deviation; Corporate performance

JEL-Codes: G32; G34; G14; L25

Resumo

Este estudo analisa se o desempenho das aquisições realizadas por empresas adquirentes subendividadas depende da direção ou da medida contínua dos desvios do nível de endividamento ótimo face à estrutura de capital ótima. A literatura demonstra que os adquirentes preservam estrategicamente capacidade de endividamento antes das aquisições e que a estrutura de capital das empresas-alvo influencia o desempenho pós-aquisição, mas ainda não distinguiu estas duas dimensões. Reunimos uma amostra de 226 aquisições concluídas por empresas cotadas subendividadas entre 2014 e 2024, com forte representação da região Ásia-Pacífico. O nível ótimo de endividamento é estimado segundo Frank e Goyal (2009), sendo o desempenho avaliado através dos retornos anormais acumulados no período do anúncio (CARs), dos retornos anormais de longo prazo (BHARs) dos acionistas até 36 meses após a aquisição e das variações do ROA e do Q de Tobin. Não há evidência de que o endividamento das empresas-alvo seja avaliado aquando do anúncio: nem o indicador direcional nem a medida contínua dos desvios explicam os retornos de curto prazo, sendo que uma análise complementar do sentimento das notícias sugere que este resultado não está associado à informação narrativa. Em horizontes mais longos, a evidência sugere uma associação positiva entre a medida contínua dos desvios e os BHARs aos 36 meses, embora esta relação não seja observada consistentemente entre especificações. O indicador direcional acrescenta reduzido poder explicativo neste horizonte temporal. Nas especificações baseadas no Q de Tobin, ambas as medidas são estatisticamente significativas, enquanto o indicador direcional evidencia significância marginal nas especificações alargadas da variação do ROA. Globalmente, os resultados sugerem que a relevância do desalinhamento financeiro depende tanto da forma como é medido como da dimensão de desempenho considerada, sugerindo a importância de distinguir entre as dimensões contínua e direcional do desalinhamento financeiro na compreensão do desempenho pós-aquisição.

Palavras-chave: Fusões e aquisições; Estrutura de capital; Flexibilidade financeira; Subendividamento; Desvio face à estrutura de capital-alvo; Desempenho empresarial.

Table of Contents

List of Tables

List of Figures

1. Introduction

Mergers and acquisitions (M&A) represent a major component of corporate investment (Harford et al., 2009). M&A activity has increased steadily in both frequency and economic magnitude, occurring in pronounced waves and reshaping the global business landscape (Alexandridis et al., 2012; Cartwright & Schoenberg, 2006; Keenan & Wójcik, 2023). Global M&A value exceeded $4 trillion in 2025 and this trend is expected to continue despite macroeconomic shocks and heightened uncertainty (Henry & Oostende, 2025; Levy, 2025).

M&A transactions combine strategic and financing decisions (Harford et al., 2009; Uysal, 2011). As such, firms' leverage positions may influence their ability to engage in acquisitions and affect performance. However, the extent to which leverage deviations explain value creation following M&A remains unclear.

Capital structure decisions are traditionally explained by the static trade-off theory, which posits that firms choose leverage by balancing the tax benefits of debt against the expected costs of financial distress and agency conflicts (Jensen & Meckling, 1976; Kraus & Litzenberger, 1973; Modigliani & Miller, 1958). Under this framework, firms maintain a target leverage ratio that maximises firm value, with deviations reflecting suboptimal financial policies (Wu & Reuer, 2020). However, this view abstracts from market frictions that may affect leverage decisions (Nguyen & Phan, 2017; Riddiough & Zhang, 2025).

The dynamic trade-off theory extends the static framework by recognising that firms adjust towards their target leverage gradually, due to adjustment costs and financing frictions (Fischer et al., 1989; Flannery & Rangan, 2006). Empirical evidence supports this dynamic adjustment process (Harford et al., 2009; Huang & Ritter, 2009), linking leverage deviations to financing decisions (DeAngelo et al., 2011), investment opportunities (Myers & Majluf, 1984), and acquisition activity (Harford et al., 2009).

An alternative perspective is offered by the market timing theory, which suggests that firms issue equity when valuations are high and repurchase when low, implying that capital structure reflects accumulated timing decisions rather than an optimal target (Baker & Wurgler, 2002). Furthermore, some studies question the empirical relevance of target leverage. Hennessy and Whited (2005) argue that target leverage may not exist in practice, while Welch (2004) finds that firms do not actively rebalance leverage following shocks. Nevertheless, substantial empirical evidence shows that firms do exhibit target leverage

behaviour and gradually adjust towards it (Huang & Ritter, 2009). This framework provides a core pillar for the present study, notwithstanding other literature strands.

Underleveraging plays a central role in acquisition decisions (Morellec & Zhdanov, 2008; Uysal, 2011). Empirical evidence shows that acquirers often operate below their target leverage levels, suggesting that such deviations may reflect deliberate strategic choices (Blomkvist et al., 2022; Morellec & Zhdanov, 2008). Although underleveraging may appear suboptimal from a static trade-off perspective, it preserves debt capacity that can be deployed when acquisition opportunities arise, enhancing firms' ability to compete for targets and support post-acquisition restructuring. This mechanism lies at the core of the strategic underleveraging theory (Morellec & Zhdanov, 2008).

Financial flexibility can be interpreted as a firm-specific resource, consistent with the Resource-Based View (Barney, 1991; Lockett & Thompson, 2001). Since it cannot be readily replicated by financially constrained competitors, such flexibility may confer a sustained competitive advantage in acquisition markets (DeAngelo et al., 2011). However, financial flexibility suggests value creation only when deployed in a context where it can be converted into competitive outcomes, which suggests that performance implications are conditional upon the target firm's characteristics (Barney, 1991). Nevertheless, this perspective does not contradict trade-off theory since once acquisition-related uncertainty dissipates, firms are expected to rebalance leverage toward the optimum of the combined entity (Flannery et al., 2023; Harrison et al., 2014).

However, maintaining lower leverage also entails costs. These include foregone tax benefits of debt and potential underinvestment in positive net present value projects (Morgado & Pindado, 2003; Myers & Majluf, 1984; Turnbull, 1979). Therefore, the key question is not whether underleveraging exists, but under which conditions it suggests value creation - conditional on the target firm's leverage position.

The existing literature has separately established three relevant insights. First, dynamic trade-off theory demonstrates that leverage deviations are costly: firms adjust toward their optimal capital structure gradually, and the costs of misalignment increase with distance from the optimum, implying that greater deviation creates stronger pressure, and potentially greater scope, for post-acquisition adjustment (Flannery & Rangan, 2006; Harford et al., 2009). Second, takeover contest theory, reinforced by the Resource-Based View, explains why acquirers may deliberately operate below their optimal leverage as a form of strategic resource preservation and that this financial flexibility generates value only when

deployed in contexts that enable restructuring (Barney, 1991; Blomkvist et al., 2022; Morellec & Zhdanov, 2008). Third, a growing body of evidence confirms that the capital structure of the target firm independently shapes post-acquisition outcomes, making target leverage misalignment a determinant of deal performance in its own right (Flannery et al., 2023).

However, what remains unresolved is how these three strands of literature connect: specifically, whether the performance payoff to acquirer financial flexibility depends on the binary direction or on the signed continuous leverage deviation of the target from optimal capital structure. This study addresses that gap directly by tackling M&A transactions involving strategically underleveraged acquirers and targets with heterogeneous capital structures.

Post-M&A performance is inherently multi-dimensional and evolves over time. Short-term market reactions measured using cumulative abnormal returns (CARs) capture investor expectations (Ang et al., 2019; Asquith, 1983). Long-term performance reflects realised value creation. Market-based measures, including buy-and-hold abnormal returns (BHAR) and Tobin's Q, capture shareholder gains and valuation effects and constitute the primary outcomes of this study (Agrawal & Jaffe, 2003; Dessaint et al., 2025). Accounting-based measures, such as return on assets (ROA), capture operating performance (Harrison et al., 2014; Ramalingegowda & Yu, 2018) and provide complementary evidence on post-acquisition outcomes.

Building on prior evidence, this study shows that long-run value creation is more strongly associated with the continuous extent of target leverage deviations than by their direction when considering long-run realised shareholder gains. However, with respect to post-acquisition operating performance and market valuation, both the target's leverage position (under- versus overleveraged) and the signed deviation from target leverage provide meaningful explanatory power. This study offers novel international evidence on these mechanisms. Notably, the sample exhibits strong representation of Asia-Pacific (APAC) markets, thereby extending a literature that has largely focused on US and European samples. Importantly, these findings remain robust across alternative leverage measures, leverage estimation methodologies, and geographic control specifications.

The study contributes to the literature in three principal ways. First, it distinguishes between the directional and continuous representations of target leverage misalignment, suggesting that they do not convey the same information about post-acquisition outcomes. Second, it combines dynamic trade-off theory, takeover contest theory, and the literature on

target capital structure to explain why financial flexibility matters, how it shapes competition for targets, and why target leverage may influence post-acquisition performance. The Resource-Based View complements this perspective by framing financial flexibility as a strategic resource. Third, it extends prior research beyond predominantly US and European settings by providing evidence from a global sample whose composition exhibits strong Asia-Pacific representation, suggesting that the leverage-adjustment channel may also operate outside the institutional contexts that have dominated the existing literature.

The remainder of this study is organised as follows. Section 2 reviews the relevant literature. Section 3 presents the empirical methodology. Section 4 reports the results. Section 5 discusses the findings and Section 6 concludes.

2. Literature review

2.1. Capital Structure in M&A: Strategic and Financial Foundations

Mergers and acquisitions (M&A) represent a major component of corporate investment (Harford et al., 2009), contributing significantly to the restructuring of firms, industries, and global business networks (Henry & Oostende, 2025; Levy, 2025). These deals enable firms to reconfigure governance structures (Jensen & Meckling, 1976), financing policies (Harford et al., 2009; Uysal, 2011), and strategic priorities (Bauer & Friesl, 2022; Welch et al., 2020). However, the value creation implications of these transactions remain difficult to predict (Cartwright & Schoenberg, 2006).

M&A act as instruments of strategic transformation, enabling firms to reallocate resources and reshape competitive positioning more rapidly than through organic growth (Alexandridis et al., 2017). M&A success depends critically on strategic decision-making throughout the deal process, from target selection to post-acquisition integration (Welch et al., 2020). This requires strong managerial coordination and effective governance mechanisms to manage organisational frictions that arise when corporate control changes (De La Bruslerie & Enache, 2023; Jensen & Meckling, 1976).

M&A also constitute significant financial events that affect firms' capital structure and risk exposure (Ang et al., 2019; Khoo et al., 2015). Unlike routine capital expenditures, acquisitions involve large and often irreversible financial commitments that reshape firms' balance sheets (Harford et al., 2009). These deals frequently require external financing, particularly debt, connecting acquisitions to financing and leverage decisions (Ang et al.,

2019). Indirect costs, including advisory, negotiation, and managerial expenses, further increase the financial implications of these transactions (Harrison et al., 2014).

Leverage influences acquisition decisions through several economic channels. It can influence firms' ability to compete for targets and structure transactions *ex ante,* while also shaping post-deal financial policy and capital structure adjustments *ex post* (De La Bruslerie & Enache, 2023; Flannery et al., 2023).

In takeover markets, financing capacity and bid credibility shape firms' ability to compete for attractive targets (Morellec & Zhdanov, 2008). Underleveraged acquirers retain unused debt capacity that can be deployed to finance acquisitions and pursue the most attractive targets (Harford et al., 2009; Uysal, 2011). Hence, leverage affects not only whether firms engage in acquisitions, but also how they compete for and structure deals.

Beyond deal completion, leverage influences the firm's ability to undertake post-acquisition restructuring and integration (De La Bruslerie & Enache, 2023). Successful acquisitions often require substantial complementary investments and organisational changes (Flannery et al., 2023). Therefore, acquirers with unused debt capacity may be better positioned to absorb integration costs, respond to shocks and exploit potential new growth opportunities (DeAngelo et al., 2011).

From an agency perspective, leverage may serve as a mechanism of managerial discipline (Jensen & Meckling, 1976). High leverage may reduce free cash flow and limit agency conflicts, but it may also increase financial distress risk and discourage investment in positive net present value projects (Morgado & Pindado, 2003; Myers, 2003). Managers must therefore balance the pursuit of strategic opportunities (including M&A deals), with preserving financial flexibility (De Jong & Van Dijk, 2007).

Trade-off theory becomes paramount in analysing these mechanisms. Under the static version, firms define their target leverage by balancing the tax benefits of debt against expected financial and agency costs (Jensen & Meckling, 1976; Kraus & Litzenberger, 1973; Modigliani & Miller, 1958). Deviations from this target translate into value-reducing policies (Harford et al., 2009; Uysal, 2011). Dynamic trade-off theory extends this view by recognising that firms adjust to target leverage gradually (Fischer et al., 1989; Flannery & Rangan, 2006; Huang & Ritter, 2009). Empirical evidence shows that this adjustment process is influenced by valuation changes, cash flow fluctuations, and strategic considerations (Chang et al., 2014; Faulkender et al., 2012; Korteweg et al., 2022; Welch, 2004).

Together, these mechanisms suggest that leverage is not merely a financing outcome but an active strategic variable that shapes every stage of the acquisition process, from competitive positioning in takeover markets to post-deal restructuring and integration. Understanding why firms deviate from their optimal leverage, and whether those deviations are deliberate or incidental, is therefore central to explaining how M&A transactions create or destroy value.

2.2. Strategic Underleveraging and Financial Flexibility

Takeover contest models provide a leading explanation for why acquiring firms systematically operate below their target leverage prior to acquisitions (Morellec & Zhdanov, 2008). From an economic perspective, strategic underleveraging may improve expected value creation in acquisitions through several channels. First, by preserving unused debt capacity, firms reduce the costs of external financing and alleviate financial constraints (Ang et al., 2019; Uysal, 2011). Operating below target leverage also increases resilience to external shocks, which is important given the uncertainty and risk associated with acquisitions and changing macroeconomic conditions (Harford et al., 2009; Myers, 2003). Finally, financial flexibility enhances the credibility of financing commitments in competitive takeover environments, strengthening bargaining power and increasing the likelihood of securing high-value targets (DeAngelo et al., 2011; Morellec & Zhdanov, 2008).

Takeover markets are characterised by strategic interactions among bidders, who anticipate competitors' financial positions when formulating their own bids (Morellec & Zhdanov, 2008). Underleveraged acquirers therefore enjoy structural advantages in takeover contests. Highly levered firms, by contrast, face tighter financing constraints and reduced flexibility, making them less likely to prevail as bidders (Morellec & Zhdanov, 2008). Empirical evidence supports this view. Blomkvist et al. (2022) show that acquirers actively adjust their capital structures in anticipation of acquisition opportunities and competitors' moves, particularly by reducing debt. This behaviour is more pronounced in industries characterised by intense takeover competition and when expected synergies are high.

Strategic underleveraging is particularly important from the perspective of the acquiring firm (Blomkvist et al., 2022; Morellec & Zhdanov, 2008). In the pre-deal stage, acquirer's financial flexibility shapes the bidding process and increases the likelihood of completing a transaction (Blomkvist et al., 2022). It also improves target screening by

enabling acquirers to identify stronger strategic, financial, and organisational matches and to respond more effectively to competitive pressures during negotiations (Welch et al., 2020).

The role of financial flexibility on the acquirer side also extends to the post-acquisition period (Harrison et al., 2014). It enhances long-term outcomes by positioning firms in a stronger financial and competitive position from the outset of the transaction (Harrison et al., 2014). Moreover, these acquirers are better able to undertake follow-on investments, support post-deal growth opportunities (DeAngelo et al., 2011), and facilitate organisational restructuring (Flannery et al., 2023).

Strategic underleveraging is not expected to be permanent (Blomkvist et al., 2022; Morellec & Zhdanov, 2008). Instead, it is temporary and contingent on acquisition-related conditions, particularly the intensity of takeover competition. Once transactions are completed and uncertainty declines, firms tend to increase leverage to restore tax benefits and converge toward their target capital structures (Harford et al., 2009; Khoo et al., 2015). This dynamic behaviour is consistent with trade-off theory, as firms may optimally remain underleveraged *ex ante* when financial flexibility is valuable, but subsequently rebalance toward the target leverage of the combined entity after the transaction (Flannery et al., 2023).

Strategic underleveraging can also be interpreted through the Resource-Based View (RBV), which emphasises that competitive advantage arises from valuable and difficult-to-replicate firm-specific resources (Barney, 1991; Lockett & Thompson, 2001). Financial flexibility, arising from deliberately maintaining unused debt capacity, represents such a resource by enabling firms to act quickly and credibly in uncertain and competitive environments (Blomkvist et al., 2022; DeAngelo et al., 2011).

However, the RBV specifies that resources generate value only when deployed in a context where they can be converted into competitive outcomes (Barney, 1991). Hence, financial flexibility does not foster value in isolation; instead, its post-deal implications depend on the deployment context, including the financial characteristics of the target firm. The value of the resource therefore scales with the scope for restructuring it enables, and that scope increases with the continuous extent of target leverage misalignment.

This conditional logic is central to the present study. Beyond target characteristics, heterogeneity in performance outcomes may also be reinforced by deal-specific conditions such as takeover competition, expected synergies, and post-acquisition financing needs (Harrison et al., 2014; Morellec & Zhdanov, 2008). As a result, strategic underleveraging is unlikely to generate uniform benefits across transactions (DeAngelo et al., 2011; Harford et

al., 2009), making it essential to understand the conditions under which financial flexibility translates into value creation in M&A (Uysal, 2011).

2.3. Target firm's capital structure

The target firm's financial characteristics independently shape M&A outcomes. Flannery et al. (2023) show that targets deviating substantially from optimal leverage create greater scope for post-deal restructuring and capital reallocation by the combined firm.

M&A deals result in the creation of a combined entity that integrates the assets, liabilities, and cash flows of both the acquirer and the target (Harford et al., 2009; Lindner et al., 2023). The merged firm may face a different risk profile, debt capacity, and investment opportunity set relative to both firms prior to the transaction (Khoo et al., 2015). As a result, the optimal capital structure of the combined firm may differ from the pre-deal target leverage of both the acquirer and the target (Harford et al., 2009; Harrison et al., 2014). Furthermore, the realisation of synergies, the restructuring of operations, and the pursuit of future growth depend on the ability of the new entity to adjust toward that new optimum (De La Bruslerie & Enache, 2023; Flannery et al., 2023).

The financial condition of the target shapes the pre-deal phase. During target screening, acquirers assess both strategic and financial characteristics of potential targets (Welch et al., 2020). They seek firms with complementary assets, innovation potential, and similar growth prospects to enhance competitive advantage and long-term value creation (Bauer & Friesl, 2022; Cuypers et al., 2017).

The financial condition of the target firm is also central to deal outcomes (Flannery et al., 2023). The value of acquirer financial flexibility is not fixed. It depends on the deployment context - specifically, on the financial characteristics of the target (Barney, 1991). Strategically underleveraged acquirers can engage with both over- and underleveraged targets, but the mechanism through which value is created differs across these two configurations.

When underleveraged acquirers acquire overleveraged targets, value creation is expected to arise primarily through financial restructuring: relieving financing constraints, refinancing high-cost debt, and improving the target's investment efficiency (Flannery et al., 2023; Harrison et al., 2014). Overleveraged targets often face constrained access to capital, elevated distress risk, and underinvestment problems that limit their ability to exploit profitable opportunities (Morgado & Pindado, 2003; Myers & Majluf, 1984). Financial flexibility, deployed as a restructuring resource, directly addresses these frictions.

When underleveraged acquirers acquire underleveraged targets, value creation operates through a different mechanism. The combined entity benefits from preserved financial slack, lower financing costs, and enhanced capacity to fund post-acquisition investments and integration (DeAngelo et al., 2011). This flexibility facilitates the realisation of operational synergies, innovation, and expansion in uncertain environments (Blomkvist et al., 2022), further highlighting the competitive advantage that underleveraged acquirers have.

Beyond financial structure, acquisition outcomes also depend on target-level governance, information asymmetries, and organisational characteristics (Balachandran et al., 2024; Cuypers et al., 2017). Targets with strong governance reduce uncertainty and facilitate restructuring, while weak governance may increase legal, reputational, and integration risks. These characteristics may interact with the acquirer's financial flexibility, shaping how effectively strategic underleveraging translates into realised performance (Flannery et al., 2023).

2.4. Acquisition performance across time horizons

Leverage influences acquisition outcomes through distinct economic mechanisms that unfold across the M&A timeline (Harford et al., 2009; Harrison et al., 2014). At announcement, cumulative abnormal returns (CARs) capture investor expectations about deal credibility, anticipated synergies, and the acquirer's perceived ability to finance and complete the transaction (Ang et al., 2019; Asquith, 1983). Over longer horizons, performance reflects whether anticipated synergies, restructuring gains, and strategic complementarities are effectively realised (Agrawal & Jaffe, 2003; Dessaint et al., 2025).

At announcement, underleveraged acquirers may benefit from stronger credibility and bargaining power in takeover contests (DeAngelo et al., 2011; Morellec & Zhdanov, 2008). Whether target leverage is simultaneously priced, however, is less clear. Since post-acquisition capital structure decisions depend on integration outcomes unobservable at deal disclosure, announcement returns are more likely to reflect deal quality and completion probability than the scope for balance sheet adjustment (Ahmed & Elshandidy, 2020; Asquith, 1983). Short-run reactions may also be led by media coverage and deal narrative rather than financial fundamentals (Danbolt et al., 2015; Fu et al., 2019; Liao et al., 2021), a channel this study empirically assesses.

Over longer horizons, accounting-based measures such as ROA capture operating improvements from post-acquisition restructuring, though they may lag due to integration

frictions (Harrison et al., 2014). Market-based indicators, including Tobin's Q and buy-and-hold abnormal returns (BHARs), are better positioned to capture the value of leverage adjustment as it unfolds, reflecting both realised performance and evolving growth expectations (Agrawal & Jaffe, 2003; Dessaint et al., 2025). Since adjustment speed varies across firms and institutional settings (Gungoraydinoglu & Oztekin, 2011), analysing horizons of up to 36 months strengthens the ability to detect this channel.

The effects of strategic underleveraging may therefore differ systematically across short- and long-term horizons depending on the target's leverage position. Evidence that announcement returns and long-run performance diverge substantially for acquirers is consistent with this view (Agrawal & Jaffe, 2003; Tao et al., 2017) and motivates the joint analysis of both horizons in this study.

2.5. Literature gap and research hypothesis

The preceding sections establish three interlocking bodies of evidence. Dynamic trade-off theory demonstrates that leverage deviations are not permanent as firms adjust toward their optimal capital structure gradually while accounting for the costs of misalignment, meaning that a more misaligned target offers greater scope for post-acquisition restructuring (Flannery & Rangan, 2006; Harford et al., 2009). Takeover contest theory, grounded in the Resource-Based View, suggests that acquirers deliberately underleverage before acquisitions to preserve financial flexibility as a strategic resource, generating value when deployed to support bidding and post-acquisition restructuring (Barney, 1991; Blomkvist et al., 2022; DeAngelo et al., 2011; Morellec & Zhdanov, 2008). Evidence on target firm capital structure confirms that the target's leverage position independently shapes post-acquisition outcomes (Flannery et al., 2023). Together, these frameworks predict that performance depends on the interaction between acquirer financial flexibility and target leverage misalignment but leave open which dimension of that misalignment is operative.

What these strands have not jointly addressed is whether the operative dimension of target leverage misalignment is its direction or its degree. The binary directional classification assigns targets to one of two categories - overleveraged or underleveraged - based solely on whether their actual leverage exceeds or falls short of the firm-specific optimum estimated (Frank & Goyal, 2009). The continuous leverage deviation, by contrast, is a signed scalar running from large negative values for deeply underleveraged targets through zero to large positive values for heavily overleveraged ones, preserving both direction and distance along

a single uninterrupted scale. Existing studies have predominantly relied on the binary representation, leaving unclear whether the continuous measure provides additional explanatory power for post-acquisition outcomes, particularly where acquirer financial flexibility enables meaningful post-acquisition capital structure adjustment (Flannery et al., 2023; Harford et al., 2009). The present study addresses this question.

Resolving this distinction matters both theoretically and empirically. If the binary direction leads the outcomes, value creation arises primarily from financial constraint relief, as overleveraged targets benefit more from acquirer flexibility due to their heightened financing constraints. If the continuous deviation becomes more relevant, the mechanism is richer: as targets become progressively more overleveraged, they offer increasingly greater scope for post-acquisition restructuring and capital reallocation, and the acquirer's financial flexibility can be more productively deployed. Korteweg (2010) shows that deviations from optimal leverage carry economically meaningful value implications. In the present setting, this suggests that the extent of a target's positive leverage deviation may provide information beyond the binary distinction between over- and underleveraged firms.

These mechanisms are consistent with the broader sources of value creation in M&A, typically attributed to managerial, operational, and financial synergies (Devos et al., 2009; Trautwein, 1990). Financial flexibility plays a central role in realising financial synergies, particularly when acquisitions involve targets with misaligned capital structures requiring post-deal restructuring. The extent to which these synergies materialise therefore depends on how effectively financial flexibility is deployed given the target's financial condition, motivating the following research question: *does post-acquisition performance depend on whether the target is over- or underleveraged, or on the continuous extent of the target's leverage deviation from its optimum?*

Importantly, the mechanisms through which financial flexibility leads to value creation are likely to differ across time horizons. Announcement-period returns primarily reflect investor expectations regarding deal quality, financing risk, and the credibility of anticipated synergies. Transactions involving underleveraged acquirers and similarly unconstrained targets may therefore be perceived more favourably, signalling lower execution risk and greater capacity to exploit investment opportunities. By contrast, realised long-run performance depends on the extent to which acquirers can deploy their financial flexibility through post-acquisition restructuring and capital structure adjustment. More overleveraged targets may offer greater scope for these actions and, consequently, greater potential gains. Thus, the determinants of favourable market reactions at announcement

need not coincide with those of realised value creation over longer horizons. This leads to the first hypothesis:

H1: *Within acquisitions undertaken by underleveraged acquirers, announcement-period cumulative abnormal returns are higher when the target is also underleveraged.*

Consistent with this reasoning, long-run value creation is expected to arise primarily through restructuring and capital structure adjustment. As the target's leverage deviation increases—that is, as targets become more overleveraged—the scope for deploying the acquirer's financial flexibility also expands. This leads to the second hypothesis:

H2: *Within acquisitions undertaken by underleveraged acquirers, long-run post-acquisition performance increases with the continuous deviation of the target's leverage from its estimated optimum.*

This perspective also implies that the binary classification of targets as over- or underleveraged provides only a partial view of acquisition dynamics. While the directional indicator captures the sign of deviation, it discards information about where along the spectrum a target sits. If value creation scales with the extent of target leverage misalignment, the binary classification should be a weaker predictor than the underlying continuous measure. This leads to the third hypothesis:

H3: *Within acquisitions undertaken by underleveraged acquirers, how far the target deviates from its optimal leverage matters more for long-run post-acquisition performance than whether it is over- or underleveraged.*

These hypotheses formalise the central prediction of this study: that the determinants of favourable announcement reactions differ from those of realised long-run value creation, and that the continuous representation of target leverage misalignment provides a richer characterisation of post-acquisition dynamics than a binary directional classification. Figure 1 summarises the theoretical foundations, literature gap, research question, and hypotheses developed throughout this chapter. The following section presents the empirical strategy used to test these predictions.

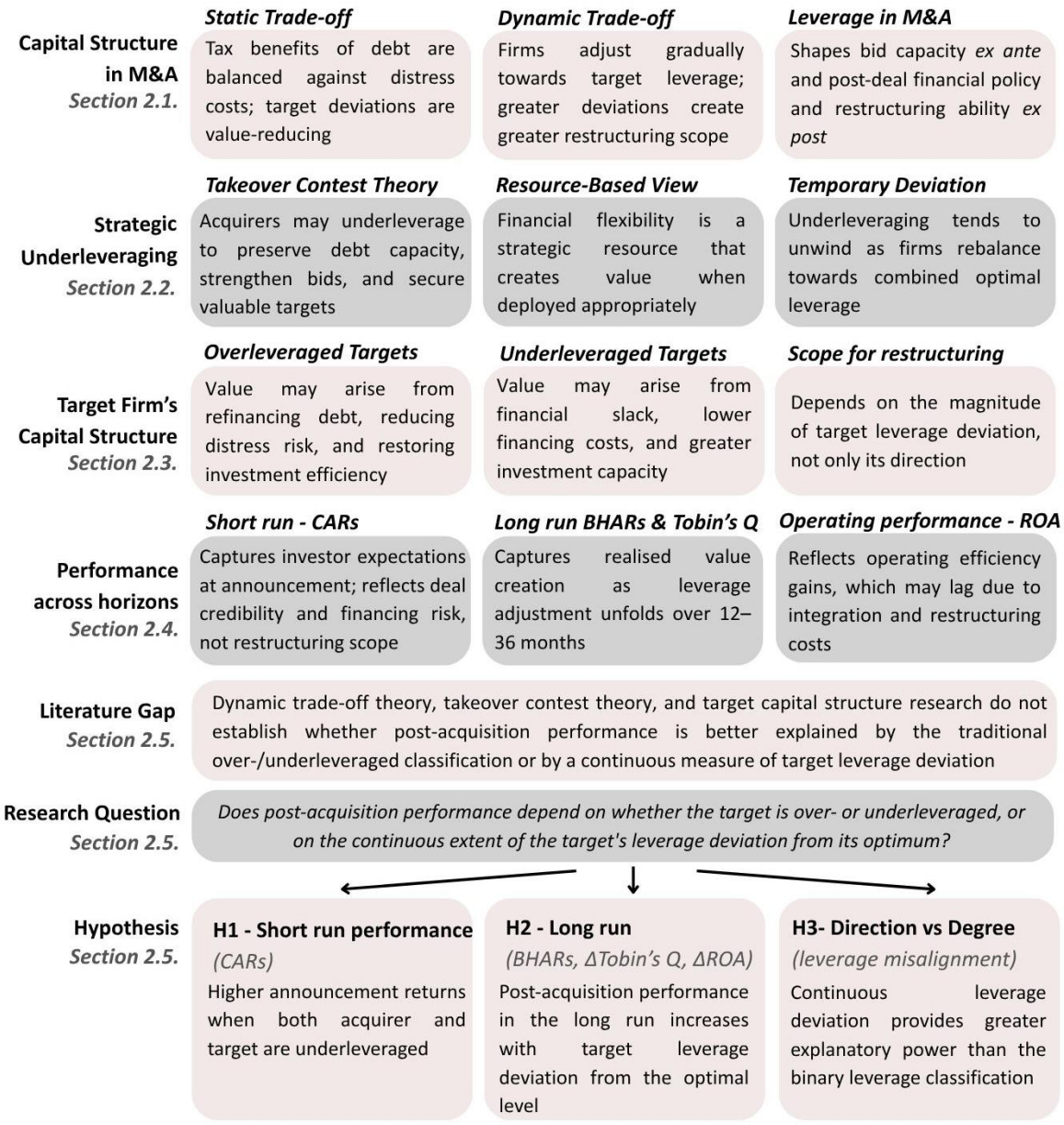

Figure 1. Theoretical Foundations and Research Framework.

3. Empirical Approach

This section presents the empirical strategy used to examine whether post-acquisition performance of underleveraged acquirers depends on the target's leverage position, and specifically whether this relationship is determined by the binary direction of leverage deviation or by its continuous value. Target leverage is estimated following Frank and Goyal (2009), and leverage deviation is constructed following Uysal (2011) and Harford et al. (2009). Short-run performance is measured via announcement-period cumulative abnormal returns (CARs) using standard event-study methodology (Asquith, 1983; Dessaint et al., 2025; Khoo

et al., 2015), and long-run performance via buy-and-hold abnormal returns (BHARs) (Agrawal & Jaffe, 2003), complemented by post-deal changes in return on assets and Tobin's Q (Harrison et al., 2014).

3.1. Data sources and sample construction

The empirical analysis relies on deal-level information obtained from the Orbis M&A Database, while firm-level accounting and market data are sourced from the LSEG Datastream Excel add-in and the LSEG Data Library for Python, respectively.

A global market benchmark, the iShares MSCI ACWI ETF (NASDAQ), is employed throughout the analysis. The primary objective of the event-study design is to compare abnormal returns across acquisitions undertaken in different countries rather than to evaluate whether individual acquirers outperform their domestic equity markets. A common benchmark therefore improves comparability across observations and avoids introducing benchmark heterogeneity unrelated to deal characteristics (MacKinlay, 1997). The MSCI ACWI provides a broad and investable representation of the global equity market, covering both developed and emerging economies and therefore reflecting the geographic composition of the sample (MSCI, 2024). A potential limitation is that the benchmark is a US-listed ETF, implying that daily abnormal returns may be affected by non-synchronous trading across time zones, particularly for Asia-Pacific acquirers (Scholes & Williams, 1977; Dimson, 1979). This concern is most relevant for short-window CAR analyses and is less severe for BHAR measures computed from monthly returns.

The initial sample comprises completed M&A transactions announced between 1 January 2014 and 31 December 2024, spanning different phases of global M&A activity. Both acquirer and target are required to be publicly listed, since the analysis depends on market prices and financial disclosures for leverage and performance measurement. Financial institutions (NACE codes 64–66; SIC (UK) codes 64–66; NAICS code 52) and utility firms (NACE codes 35–39; SIC (UK) codes 35–39; NAICS code 22) are excluded given their distinct regulatory environments and structural differences in capital structure.

Starting from 1,153 transactions, standard filters are applied: deals involving multiple acquirers or targets are excluded, as are observations lacking valid ISIN identifiers, residual financial-sector firms, and transactions without a meaningful transfer of control (final stake below 50%) (Ortiz et al., 2023). The resulting sample consists of 862 transactions, as summarised in Table 1.

Table 1. Sample Construction.

Selection Criterion	Number of deals
Initial extract: completed M&A, 2014–2024, both parties listed, excl. financials and utilities	1,153
Remove deals with multiple acquirers or multiple targets	-146
Remove deals where target has no ISIN in LSEG universe	-77
Remove banking or financial services firms not captured by initial sector filters	-37
Remove deals with unknown acquirer stake or final stake below 50%	-25
Remove deals where acquirer has no ISIN in LSEG universe	-6
Clean Sample from ORBIS M&A	**862**

These 862 deals are matched to 50,889 publicly listed firms in LSEG (excluding Financials and Utilities), yielding 1,375 matched firms. Since firms may participate in multiple transactions or appear in different roles across deals, identifiers are retained with duplicates at this stage.

Transactions with a deal value below USD 1 million are further excluded since they cannot affect the acquirer's balance sheet, capital structure, or performance trajectory in any meaningful way (Uysal, 2011). The resulting analytical samples are summarised in Table 2, while Annex A provides additional details on the matching and sample construction procedures.

Table 2. Analytical Sample Construction.

Selection Criterion	Number of deals
Clean sample from ORBIS M&A	862
Remove deals with transaction value below USD 1 million	-212
Clean analytical deal sample	650
Restrict sample to underleveraged acquirers	226
Require target leverage deviation to be observable	131
Outcome-specific estimation samples	
CAR [-1,+1], [-2,+2], [-5,+5] analysis	118
BHAR 12m analysis	113
BHAR 24m analysis	93
BHAR 36m analysis	85
ΔTQ (t+1 vs t-1) analysis	94
ΔROA (t+1 vs t-1) analysis	40
ΔTQ (t+2 vs t-1) analysis	87
ΔROA (t+2 vs t-1) analysis	32

The final analytical dataset is constructed at the deal level, with all explanatory variables measured in the fiscal year preceding the announcement date. Data sources are merged using identifiers appropriate to each variable type. CARs are matched using the acquirer's ISIN and announcement date, BHARs using the acquirer's ISIN and completion date, and accounting-based measures (ΔROA and ΔTobin's Q) through pre- and post-acquisition firm-year observations.

Restricting the sample to underleveraged acquirers yields 226 transactions. This restriction reflects the focus of the study on acquisitions undertaken by firms that maintain financial flexibility below their leverage optimum rather than a data limitation. Estimating target leverage deviations requires sufficient accounting and market data to construct firm-specific leverage benchmarks following Frank and Goyal (2009), reducing the leverage-matched sample to 131 transactions. The final estimation samples vary across specifications because each dependent variable requires different post-acquisition data availability, as reported in Table 2.

3.2. Variable Construction

This section defines the key variables used in the empirical analysis, including leverage measures, performance outcomes, and control variables.

3.2.1 Independent Variables

Market leverage is used as the primary measure of capital structure, reflecting contemporaneous firm valuation and effective debt capacity. Book leverage is constructed as a robustness measure. Both measures are calculated at the fiscal year-end preceding the announcement and winsorised at the 1st and 99th percentiles (Frank & Goyal, 2009; Hovakimian et al., 2004). The definitions are provided in Equations (1) and (2), respectively:

$$Market\ leverage = L\_mkt_{i,t} = \frac{Total\ Debt}{Total\ Debt + Market\ Capitalisation} \qquad (1)$$

$$Book\ leverage = L\_book_{i,t} = \frac{Total\ Debt}{Total\ Assets} \qquad (2)$$

Grounded in the dynamic trade-off framework (Flannery & Rangan, 2006), target leverage for each firm is estimated using a pooled OLS regression on firm-level determinants, following Frank and Goyal (2009) and Harford et al. (2009). Specifically:

$$L^*_{i,t} = \beta \mathrm{X}_{i,t-1} + \gamma_t + \varepsilon_{i,t} \qquad (3)$$

where $\mathrm{X}_{i,t-1}$ is a vector of lagged firm-level characteristics including the natural logarithm of total assets (Size); fixed assets scaled by total assets (Tangibility); income before taxes scaled by total assets (Profitability); the market-to-book ratio (MTB); depreciation and amortisation over total assets (NDTS); and γ_t represents year fixed effects (Frank & Goyal, 2009; Harford et al., 2009). Although developed in a US context, the Frank and Goyal (2009) framework has been shown to apply broadly across institutional settings (Gungoraydinoglu & Oztekin, 2011) and is estimated here on the full international sample.

The full specification is estimated on 6,882 firm-year observations ($R^2 = 0.199$; $F = 100.46$), with all coefficients significant at the 1% level and signs consistent with standard capital structure theory. A reduced specification excluding MTB and NDTS, which are more frequently missing in international samples, is estimated on 7,138 observations; explanatory power declines ($R^2 = 0.110$) but coefficient signs remain stable. Detailed results are reported in Table B.1. (Annex B).

Leverage deviation is computed as the difference between observed leverage and estimated target leverage, following Harford et al. (2009) and Uysal (2011):

$$LevDev_i = L\_mkt_{i,t} - L^*_{i,t} \qquad (4)$$

$$LevDev_i = L\_book_{i,t} - L^*_{i,t} \qquad (5)$$

Positive values indicate overleveraging and negative values underleveraging. The deviation is computed separately for acquirers and targets, and a binary indicator classifies each firm accordingly (Tao et al., 2017; Uysal, 2011). Because leverage deviations are constructed using estimated target leverage ratios, they constitute generated regressors. Consequently, the second-stage regressions do not explicitly incorporate the uncertainty associated with the first-stage estimation of target leverage. Consistent with prior studies employing similar methodologies (Harford et al., 2009; Uysal, 2011), inference is based on conventional robust standard errors and should therefore be interpreted with appropriate caution.

3.2.2 Dependent Variables

Short-run market reactions are measured using cumulative abnormal returns (CARs) obtained through a market-adjusted event study methodology (Asquith, 1983; Harrison et al., 2014; MacKinlay, 1997). This approach is particularly suitable in international settings since it avoids estimating firm-specific betas, which may introduce additional noise when firms operate across heterogeneous markets and event windows are short. Prior M&A studies show that, over narrow announcement windows, market-adjusted returns perform similarly to market-model specifications while offering greater transparency and comparability across firms (Asquith, 1983; MacKinlay, 1997).

Abnormal returns are defined as $AR_{i,t} = R_{i,t} - R_{m,t}$, where $R_{i,t}$ is the acquirer's daily total return and $R_{m,t}$ is the return on benchmark, summed over three event windows: $[-1,+1]$, $[-2,+2]$, and $[-5,+5]$ trading days around the announcement date, as in equation

(6). Minimum data requirements of two, three, and five non-missing abnormal return observations are imposed for the respective windows, and transactions failing to satisfy these thresholds are excluded. All CAR measures are winsorised at the 1st and 99th percentiles.

$$CAR_i(t_1, t_2) = \sum_{t=t_1}^{t_2} AR_{i,t} \qquad (6)$$

Long-run performance is assessed via buy-and-hold abnormal returns (BHARs) over 12, 24, and 36 months following deal completion (Agrawal & Jaffe, 2003; Dessaint et al., 2025). BHARs are winsorised at the 1st and 99th percentiles.

Although BHARs are widely used in the M&A literature, they may exhibit skewed distributions and cross-sectional dependence when event windows overlap in calendar time (Lyon et al., 1999). Consistent with prior studies, inference is based on heteroskedasticity-robust standard errors, and this limitation is discussed further in Section 5.5.

$$BHAR_{i,T} = \prod_{t=1}^{T}(1 + R_{i,t}) - \prod_{t=1}^{T}(1 + R_{m,t}) \qquad (7)$$

In equation 7, $R_{i,t}$ and $R_{m,t}$ are decimal monthly returns for the acquirer and the ACWI benchmark respectively. Daily returns are first converted into log returns and aggregated at the monthly level. Daily returns below −99% or above +200% and monthly returns below −80% or above +300% are excluded to mitigate data errors. To address incomplete post-deal histories in more recent transactions, BHARs are calculated only when a minimum of 10, 20, and 30 monthly observations is available for the 12-, 24-, and 36-month horizons, respectively.

Operating performance is measured by the change in return on assets (ΔROA), defined as $(ROA_{t+1} - ROA_{t-1})$, over total assets, following Harrison et al. (2014) and Uysal (2011). Although accounting measures may lag the effects of restructuring and integration, they provide complementary evidence on whether financial flexibility translates into improvements in operating efficiency. ROA is defined as:

$$ROA = \frac{EBIT}{Total\ Assets} \qquad (8)$$

A second horizon using $t + 2$ versus $t - 1$ is computed as a robustness check. The profitability variable in the target leverage estimation uses income before taxes as the numerator, following Frank and Goyal (2009), whereas ROA here uses EBIT to align with standard performance measures in M&A literature.

Changes in Tobin's Q (ΔTobin's Q) provide a second primary measure of long-run performance by capturing the market's reassessment of firm value during the integration

period (Chung & Pruitt, 1994). Unlike BHARs, which reflect realised shareholder returns, Tobin's Q captures evolving growth expectations and valuation effects associated with post-acquisition adjustment. Tobin's Q is defined as:

$$Tobin's\ Q = \frac{Market\ Capitalisation + Total\ Debt\ (book\ value)}{Total\ Assets\ (book\ value)} \quad (9)$$

ΔTobin's Q is defined as $(TQ_{t+1} - TQ_{t-1})$, with an additional horizon using $t+2$ versus $t-1$ is computed as a robustness check.

Together, these measures provide complementary perspectives on post-acquisition value creation: ΔROA captures operational efficiency gains, while ΔTobin's Q reflects the market's reassessment of firm value over the integration period.

3.2.3 Control Variables

Control variables are grouped into deal-level and acquirer-level characteristics that prior research has shown to influence acquisition outcomes (Harford et al., 2009; Harrison et al., 2014; Uysal, 2011). All controls are measured prior to the announcement date.

The baseline specification includes deal size, payment method, acquirer size, and acquirer leverage deviation, capturing the core determinants of financing capacity, transaction complexity, and pre-existing financial conditions. The extended specification additionally incorporates relative deal size, profitability, growth opportunities, and deal-structure indicators to account for heterogeneity in acquisition characteristics. This approach balances model completeness against the reduction in sample coverage associated with additional data requirements.

3.3. Sample descriptive analysis

The sample is geographically concentrated in Asia-Pacific, which accounts for 160 of the 226 underleveraged-acquirer deals (70.8%), followed by other regions (N = 28), Europe (N = 26), and the Americas (N = 12), as in Figure 2. This distribution reflects the structure of publicly listed M&A activity in the LSEG universe and is consistent with the growing role of Asia-Pacific capital markets in global deal activity (Keenan & Wójcik, 2023). Prior evidence supports the cross-country applicability of standard leverage determinants (Antoniou et al., 2008; Gungoraydinoglu & Oztekin, 2011), and regional heterogeneity is addressed through robustness specifications with acquirer-region fixed effects.

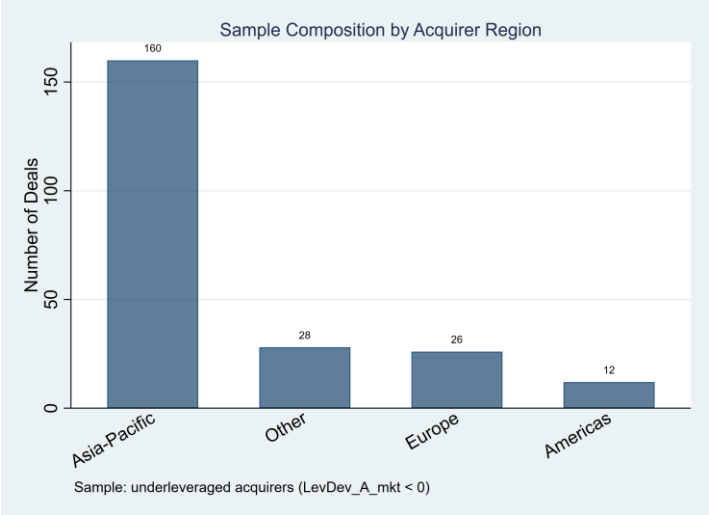

Figure 2. Sample Composition by Acquirer Region.

The temporal distribution of transactions is relatively stable (Figure 3) and broadly consistent with global M&A waves. The 2014 cluster reflects post-crisis recovery dynamics, while the 2021 initial decrease captures pandemic-related restrictions (Henry & Oostende, 2025; Levy, 2025). Cross-border activity is more prevalent in Europe and other regions, while Asia-Pacific transactions are predominantly domestic (Figure B.1. in the Annex). This heterogeneity further supports controlling for deal geography in the empirical specifications (Keenan & Wójcik, 2023).

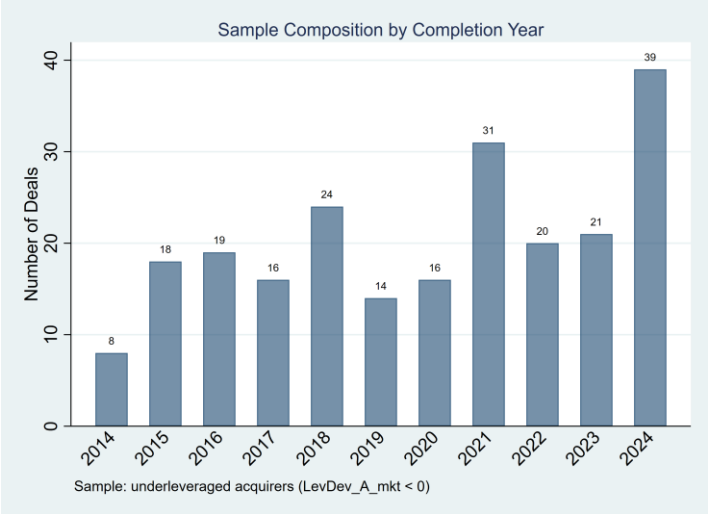

Figure 3. Sample Composition by Completion Year.

Descriptive statistics are reported across different samples to reflect variation in data availability. Tables 3 and 4 present firm-level characteristics for target and acquirer firms in the leverage-matched sample, respectively. Table 3 summarises the full set of performance and deal-level variables for the underleveraged-acquirer working sample.

Table 3. Target Firm Descriptive Statistics.

	N	Mean	SD	Min	Median	Max
Leverage Deviation (Observed Leverage – Target Leverage)	131	-0.071	0.228	-0.639	-0.105	0.520
Size (log(Total Assets))	131	23.784	3.589	14.162	23.560	30.699
Profitability (Inc. Before Taxes / Total Assets)	131	0.044	0.164	-1.120	0.045	0.472
MTB (market capitalization / Total Equity)	131	2.715	5.132	0.221	1.465	40.719
Tangibility (Fixed Assets / Total Assets)	131	0.485	0.247	0.026	0.431	0.992
NDTS (Dep. & Amortis. / Total Assets)	131	0.039	0.040	0.000	0.031	0.316

Sample: Deals where the acquirer is underleveraged and target leverage deviation is observable (N = 131). Target characteristics are measured at t−1.

Table 3 reveals that target firms are, on average, slightly underleveraged (mean Leverage Deviation = −0.071), but display substantial cross-sectional variation: leverage deviations range from −0.639 to +0.520, with a standard deviation of 0.228. This reflects the breadth of the international sample.

Table 4. Acquirer Firm Descriptive Statistics.

	N	Mean	SD	Min	Median	Max
Leverage Deviation (Observed Leverage – Target Leverage)	226	-0.160	0.113	-0.639	-0.145	-0.001
Size (log(Total Assets))	226	24.706	3.665	16.299	24.606	32.568
Profitability (Inc. Before Taxes / Total Assets)	226	0.068	0.137	-1.120	0.073	0.476
MTB (market capitalization / Total Equity)	226	2.716	2.356	0.165	1.810	11.441
Tangibility (Fixed Assets / Total Assets)	226	0.484	0.222	0.026	0.466	0.996
NDTS (Dep. & Amortis. / Total Assets)	226	0.030	0.026	0.000	0.024	0.143

Sample: Deals where the acquirer is underleveraged (N=226). Acquirer characteristics are measured at t−1.

Acquirers, by construction, all operate below their estimated target leverage (mean = −0.160), and exhibit tighter distributions across most firm characteristics. They are systematically larger (mean size 24.706 vs. 23.784) and more profitable (mean 0.068 vs. 0.044) than targets, consistent with underleveraged firms tending to be financially stronger M&A participants (Blomkvist et al., 2022). These differences motivate the inclusion of acquirer-level controls in all specifications.

Table 5. Descriptive Statistics - Underleveraged Acquirer Sample.

Variable	N	Mean	SD	Min	p25	Median	p75	Max
CAR [-1,+1]	198	0.419	5.878	-12.375	-2.017	0.120	1.855	54.776
CAR [-2,+2]	198	0.325	6.100	-11.694	-2.589	-0.017	2.015	45.951
CAR [-5,+5]	198	-0.002	7.078	-16.693	-3.598	-0.449	2.621	42.636
BHAR 12m	187	0.032	0.588	-0.888	-0.293	-0.086	0.198	3.369
BHAR 24m	162	0.013	0.742	-1.086	-0.465	-0.139	0.322	4.594
BHAR 36m	150	0.020	0.960	-1.246	-0.569	-0.158	0.336	6.088
ΔROA (t+1 vs t-1)	74	-0.009	0.051	-0.165	-0.030	-0.007	0.015	0.147
ΔTQ (t+1 vs t-1)	169	-0.261	0.996	-4.866	-0.499	-0.153	0.098	2.867
ΔROA (t+2 vs t-1)	64	-0.004	0.060	-0.140	-0.022	-0.007	0.015	0.216
ΔTQ (t+2 vs t-1)	149	-0.263	0.988	-4.678	-0.541	-0.167	0.187	2.401
Targets' Leverage Deviation	131	-0.071	0.228	-0.639	-0.230	-0.105	0.102	0.520
Acquirers' Leverage Deviation	226	-0.160	0.113	-0.639	-0.218	-0.145	-0.073	-0.001

Log (Deal Value)	226	3.032	1.983	0.139	1.642	2.581	3.878	10.463
Relative Deal Size (Deal Value/Market Cap)	226	0.187	1.678	0.000	0.000	0.000	0.007	23.861
Size of Acquirer (as in Table 3)	226	24.706	3.665	16.299	21.868	24.606	27.541	32.568
Profitability of Acquirers (as in Table 3)	226	0.068	0.137	-1.120	0.039	0.073	0.117	0.476
MTB of Acquirers (as in Table 3)	226	2.716	2.356	0.165	1.117	1.810	3.477	11.441
Cross Border Deals	226	0.142	0.349	0.000	0.000	0.000	0.000	1.000
Cash Financed Deals	226	0.553	0.498	0.000	0.000	1.000	1.000	1.000
Overleveraged Targets	131	0.313	0.465	0.000	0.000	0.000	1.000	1.000

Sample: Deals where the acquirer is underleveraged. CARs are reported in percentage points; BHARs and accounting outcomes in decimal form (e.g. 0.30 corresponds to +30%). All continuous variables are winsorised at the 1st and 99th percentiles.

Announcement-period CARs are close to zero across all windows - means of +0.419%, +0.325%, and −0.002% for [−1,+1], [−2,+2], and [−5,+5] - with medians similarly close to zero, consistent with near-zero acquirer announcement returns documented in the literature (Dessaint et al., 2025; Harrison et al., 2014). Long-run BHARs are right-skewed: mean BHARs are positive at all three horizons (+3.2%, +1.3%, +2.0%) but medians are negative (−8.6%, −13.9%, −15.8%), indicating that average outcomes are due to a small number of high-performing transactions (Agrawal & Jaffe, 2003). Accounting-based measures follow a similar pattern, with negative means and medians throughout. The high dispersion across all performance measures confirms that acquisition outcomes are highly heterogeneous, motivating the conditional regression framework in Section 3.4.

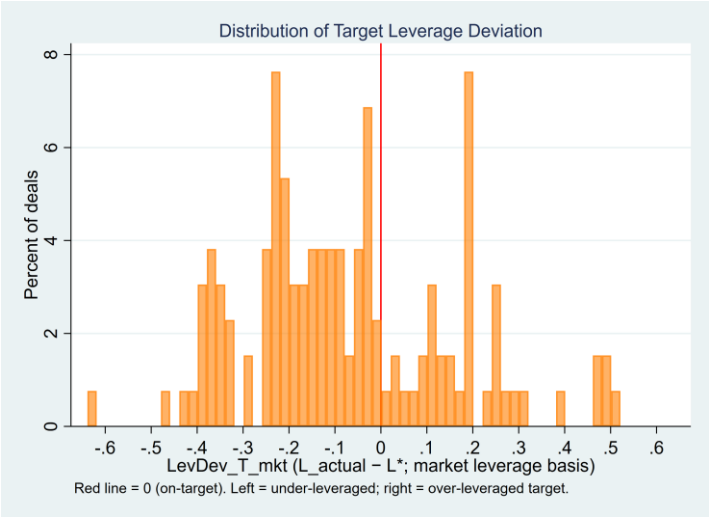

Figure 4. Distribution of Target Leverage Deviation (N=131).

The distribution of target leverage deviation (Figure 4) is broadly centred near zero but exhibits a bimodal shape, with observations clustering on both sides of the optimal leverage threshold. The leverage-matched sample contains 90 underleveraged and 41

overleveraged targets (approximately 2.2:1), consistent with the well-documented persistence of negative leverage deviations (Harford et al., 2009), which limits the statistical power of group-level comparisons. Crucially, the continuous variation across the full range from −0.639 to +0.520 provides ample scope to identify the effect of the continuous deviation in the regression analysis - information that would be discarded by a purely binary classification.

Table 6. Post-Acquisition Outcomes for Underleveraged and Overleveraged Targets.

	Underleveraged Target			Overleveraged Target			Mean Difference	p-value
Variable	**N**	**Mean**	**Median**	**N**	**Mean**	**Median**		
CAR [-1,+1]	84 *(7.502)*	1.385	0.702	34 *(4.329)*	0.326	-0.304	1.059	0.340
CAR [-2,+2]	84 *(6.993)*	0.830	0.379	34 *(5.439)*	0.452	-0.407	0.378	0.754
CAR [-5,+5]	84 *(7.606)*	0.717	-0.343	34 *(6.545)*	0.360	-0.121	0.357	0.799
BHAR 12m	82 *(0.575)*	0.003	-0.085	31 *(0.741)*	0.105	-0.080	-0.102	0.493
BHAR 24m	71 *(0.659)*	-0.039	-0.138	22 *(0.616)*	-0.042	-0.183	0.003	0.984
BHAR 36m	64 *(0.783)*	-0.051	-0.175	21 *(0.997)*	-0.040	-0.505	-0.011	0.964
ΔROA (t+1 vs t-1)	30 *(0.050)*	-0.003	-0.002	10 *(0.037)*	-0.018	-0.011	0.015	0.317
ΔTQ (t+1 vs t-1)	71 *(1.105)*	-0.210	-0.087	23 *(0.544)*	-0.217	-0.096	0.007	0.968
ΔROA (t+2 vs t-1)	21 *(0.032)*	-0.001	-0.005	11 *(0.090)*	-0.002	-0.000	0.001	0.967
ΔTQ (t+2 vs t-1)	64 *(1.048)*	-0.222	-0.154	23 *(0.696)*	-0.303	-0.167	0.081	0.681

Note. Sample split by target leverage relative to predicted leverage L*. N denotes observations; standard deviations in parentheses. Difference = mean(underleveraged) − mean(overleveraged); p-values from Welch t-tests. CARs in percentage points; other variables in decimal form. Outcomes winsorised at 1st–99th percentiles.

Table 6 reports univariate post-acquisition outcomes for deals involving underleveraged and overleveraged targets. Across all performance measures - announcement-period CARs, BHARs, and changes in ROA and Tobin's Q - mean differences between the two groups are statistically insignificant. Underleveraged targets are associated with slightly higher average CARs, whereas overleveraged targets exhibit somewhat stronger average BHARs over longer horizons, but none of these differences are statistically distinguishable from zero.

Both groups also experience negative average changes in ROA and Tobin's Q, consistent with the integration costs and dilution effects documented in the long-run M&A literature (Agrawal & Jaffe, 2003; Dessaint et al., 2025). These findings do not suggest that target leverage is irrelevant. Rather, they indicate that the binary classification of targets as

under- or overleveraged is insufficient to explain differences in acquisition outcomes, motivating the multivariate analysis in Section 3.4, where the continuous measure captures information beyond the binary split.

Table 7. Mean Outcomes by Acquirer Region.

	Americas			Asia-Pacific			Europe			Other		
Variable	**N**	**Mean**	**Median**	**N**	**Mean**	**Median**	**N**	**Mean**	**Median**	**N**	**Mean**	**Median**
CAR [-1,+1]	12	4.227 *(17.611)*	-0.080	139	-0.021 *(4.118)*	-0.083	22	0.417 *(3.379)*	0.980	25	1.039 *(5.020)*	0.304
CAR [-5,+5]	12	2.540 *(16.243)*	-0.412	139	-0.260 *(6.293)*	-0.341	22	-0.513 *(3.961)*	-1.197	25	0.655 *(6.677)*	-0.481
BHAR 12m	11	0.114 *(1.132)*	-0.134	127	0.075 *(0.581)*	-0.076	23	-0.080 *(0.252)*	-0.055	26	-0.112 *(0.502)*	-0.137
BHAR 36m	9	-0.253 *(0.460)*	-0.324	99	0.139 *(1.105)*	-0.101	21	-0.220 *(0.426)*	-0.224	21	-0.184 *(0.639)*	-0.152
ΔROA(t+1 vs t-1)	6	-0.013 *(0.099)*	-0.018	41	-0.003 *(0.046)*	-0.005	17	-0.011 *(0.038)*	-0.013	10	-0.026 *(0.055)*	-0.010
ΔTQ(t+1 vs t-1)	9	-0.245 *(0.297)*	-0.297	116	-0.270 *(1.173)*	-0.111	22	-0.305 *(0.468)*	-0.221	22	-0.175 *(0.357)*	-0.102

Note. Regional classification: Americas (US, CA, MX, BR, etc.); Asia-Pacific (CN, JP, KR, AU, etc.); Europe (DE, FR, GB, IT, etc.); Other. N = number of observations; SD in parentheses. CARs in percentage points; BHARs in decimal ratios; ΔROA and ΔTQ in decimal changes.

Table 7 reports mean outcomes by acquirer region. Despite differences in institutional environments and financial systems across countries (Gungoraydinoglu & Oztekin, 2011; Keenan & Wójcik, 2023), no consistent pattern emerges in acquisition performance across regions. Americas-based acquirers show the highest mean CAR [−1,+1] at 4.227 pp, but this reflects a small subsample (N = 12) with high dispersion and does not persist at longer horizons. Asia-Pacific acquirers (N = 139) exhibit CARs close to zero and mildly positive 12-month BHARs, while European and other-region acquirers post negative long-run returns. Mean ΔROA is slightly negative across all regions, and acquirer-region fixed effects are included in robustness specifications as a precaution.

3.4. Econometric analysis

The main specifications relate post-acquisition performance outcomes to the leverage deviation of the target firm and a set of controls. For a given outcome Y_i for deal i:

$$Y_i = \beta_0 + \beta_1 Overleveraged\_T_i + \beta_2 LevDev\_T_i + \lambda X_i + \varepsilon_{i,t} \qquad (10)$$

where the first variable is a binary indicator equal to one if the target's market leverage exceeds its estimated optimal leverage (Target's Leverage Deviation > 0), and the second variable is the target's continuous market leverage deviation. X_i is a vector of deal- and acquirer-level control variables.

Including both variables allows the model to distinguish between two dimensions of target leverage misalignment. The continuous deviation variable preserves the target's position along the signed leverage deviation spectrum, from underleveraged (negative values) to overleveraged (positive values). The coefficient β_2 therefore captures how performance changes as targets move along this continuum.

The binary indicator captures a distinct effect. Conditional on the continuous deviation already being included, β_1 does not estimate a separate slope for overleveraged targets. Instead, it captures whether an additional shift in performance occurs when leverage deviation crosses zero. Consequently, the specification allows performance to vary continuously with signed leverage deviation while also permitting a discontinuity at the threshold between underleveraged and overleveraged targets.

This interpretation is illustrated in Figure 5. The slope of the fitted relationship is determined by β_2, while β_1 introduces an additional vertical shift that applies only to overleveraged targets. The specification therefore allows the analysis to assess whether post-acquisition performance is more closely associated with the target's position along the leverage deviation spectrum or with the simple classification of targets as underleveraged or overleveraged.

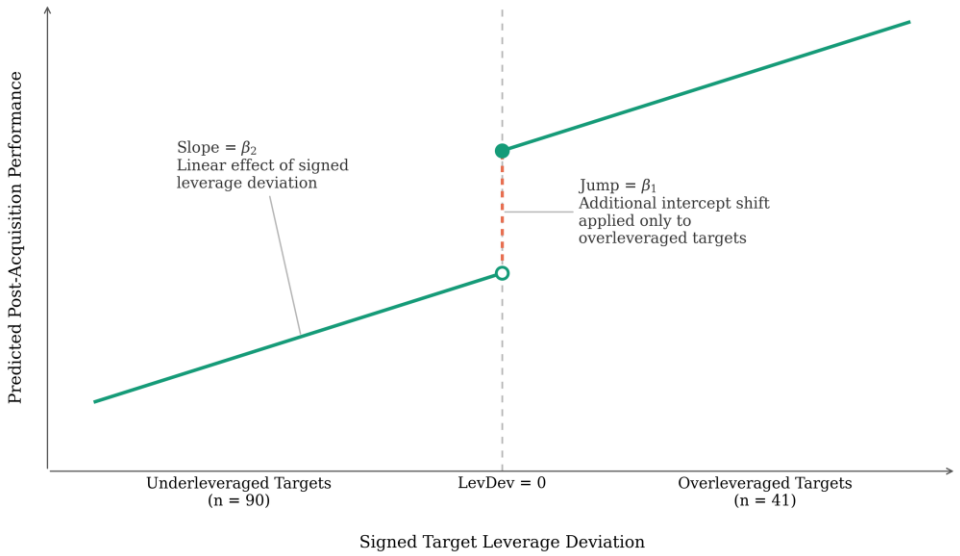

Figure 5. Interpretation of the Leverage Deviation Specification.

The model is estimated by OLS with heteroscedasticity-robust standard errors (White, 1980). Given the cross-sectional deal-level structure, firm fixed effects are not applicable. Year fixed effects are included in robustness specifications. Each outcome is estimated under two control specifications, as described in Section 3.2.

The expected signs of the coefficients differ across performance horizons. Under H1, $\beta_1 < 0$ in CAR specifications: investors should price the lower integration risk associated with underleveraged targets positively at announcement (Bruner, 1988; Uysal, 2011). Under H2, $\beta_2 > 0$ in long-run specifications: as the target's leverage deviation increases, the scope for post-deal restructuring grows and the acquirer's financial flexibility can be more productively deployed (Flannery et al., 2023). H3 is evaluated by examining the relative informativeness of β_1 and β_2. If β_2 remains statistically significant while β_1 contributes limited incremental explanatory power, this would suggest that post-acquisition performance is more closely associated with the target's position along the signed leverage deviation spectrum than with the simple classification of targets as underleveraged or overleveraged.

The robustness of the main findings is assessed along several dimensions. First, leverage deviation is reconstructed using book leverage to address potential mechanical links between market-based leverage and stock price movements (Welch, 2004). Second, target leverage is re-estimated using a reduced-form specification excluding MTB and NDTS, mitigating concerns related to sample selection (Frank & Goyal, 2009). Third, all performance outcomes are re-estimated on unwinsorised samples. Fourth, geographic heterogeneity is addressed by incorporating acquirer-region and acquirer-country fixed effects and by splitting the sample into Asia-Pacific and Rest-of-World subsamples (Gungoraydinoglu & Oztekin, 2011). Finally, long-run BHAR specifications are re-estimated using the absolute value of leverage deviation rather than its signed value. This test assesses whether long-run performance is driven by the target's position along the leverage deviation spectrum or simply by the magnitude of the deviation from the estimated optimum, regardless of whether the target is underleveraged or overleveraged.

While the robustness tests above examine coefficient stability, an additional diagnostic is introduced to improve the interpretation of the announcement-period results. Announcement-period returns may reflect the narrative information environment - media coverage, press releases, and the tone of financial news - rather than underlying financial fundamentals (Danbolt et al., 2015; Liao et al., 2021). If announcement-period returns are primarily driven by narrative factors, a null H1 result may reflect the dominance of information environment effects over target leverage characteristics rather than a genuine absence of market reaction to leverage misalignment. This diagnostic is therefore distinct from the robustness tests in Section 4.4, which assess coefficient stability, and instead

addresses a specific interpretive question about what announcement-period CARs actually capture.

To implement this diagnostic, headlines are collected from Google News using combinations of acquirer name, target name, and transaction keywords, capturing the information realistically observable by market participants at announcement (Hajek & Henriques, 2024; Liao et al., 2021). Two variables are constructed. The first is a binary indicator equal to one when at least one deal-related headline is retrieved, capturing deal visibility and investor attention. The second is a continuous measure of the average tone of retrieved headlines, constructed using the Loughran–McDonald financial dictionary (Loughran & McDonald, 2015; 2020). The augmented specification is:

$$Y_i = \beta_0 + \beta_1 Overleveraged\_T_i + \beta_2 LevDev\_T_i + \beta_3 Sentiment_i + \beta_4 NewsExistence_i + \lambda X_i + \varepsilon_{i,t} \quad (11)$$

To assess the representativeness of the headline retrieval process, coverage rates were examined across regions. Of the 226 transactions included in the sentiment sample, 79.2% yielded at least one retrievable deal-related headline. Coverage remained consistently high across the principal regions represented in the sample, including 80.0% for Asia-Pacific transactions and 76.9% for European transactions, reducing concerns that the analysis is driven by systematic regional differences in Google News availability. Full details of the data collection procedure, including search query construction, headline matching criteria, and sentiment score computation, are provided in Annex D.

4. Results

The analysis evaluates the hypotheses across multiple performance dimensions. Announcement-period CARs capture short-run market expectations and test H1. Long-run performance is assessed using BHARs, ΔROA, and ΔTobin's Q, providing complementary market-based and accounting-based perspectives on realised value creation for H2 and H3. All regressions are estimated on the leverage-matched sample of 131 deals, though sample size varies across outcome variables as explained in Section 3.

The results reveal a consistent but nuanced pattern. Target leverage deviation is not priced at announcement: neither the continuous deviation measure nor the binary directional indicator explains short-run CARs, providing no support for H1. Over longer horizons, the evidence is more differentiated. In the market-based setting, the continuous deviation measure is the sole significant predictor of 36-month buy-and-hold abnormal returns, while

the binary indicator adds no incremental explanatory power. In the valuation- and accounting-based specifications (ΔTobin's Q and ΔROA, respectively), both measures attain significance – therefore, H2 and H3 receive only partial support. Overall, the evidence identifies target leverage misalignment as a long-run restructuring determinant rather than a short-run pricing signal (Flannery & Rangan, 2006; Harford et al., 2009).

4.1. Short-run market reactions: announcement-period CARs

Table 8 reports OLS regression results for announcement-period CARs across three event windows ([−1,+1], [−2,+2], and [−5,+5]) and two control specifications. Odd-numbered columns present baseline specifications controlling for deal size, payment method, acquirer size, and acquirer leverage deviation; even-numbered columns present extended specifications that additionally incorporate relative deal size, acquirer profitability, growth opportunities (MTB), and deal structure indicators. The dependent variable is the winsorised CAR in percentage points.

Table 8. OLS Regressions: Short-Run Announcement Returns.

	CAR[-1,+1]	**CAR[-1,+1]**	**CAR[-2,+2]**	**CAR[-2,+2]**	**CAR[-5,+5]**	**CAR[-5,+5]**
1 = Target Overleveraged	1.282	0.140	1.636	0.618	0.611	-0.641
	(3.960)	*(2.514)*	*(3.687)*	*(2.525)*	*(3.845)*	*(2.494)*
Target Leverage Deviation	-6.380	-3.005	-6.393	-3.310	-3.798	-0.067
	(9.810)	*(5.277)*	*(8.923)*	*(5.378)*	*(9.481)*	*(5.728)*
Controls	Baseline	Extended	Baseline	Extended	Baseline	Extended
Observations	118	118	118	118	118	118
R-squared	0.123	0.370	0.110	0.323	0.046	0.308

Note. Dependent variable: cumulative abnormal return (CAR, percentage points) over the indicated event window. Sample restricted to underleveraged acquirers with non-missing target leverage and controls. Robust standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

Across all event windows and control specifications, neither the target overleveraged indicator nor the continuous target leverage deviation variable attains statistical significance. The findings indicate that investors do not systematically differentiate between acquisition targets based on their capital structure position at the time of announcement (Ang et al., 2019), providing no empirical support for H1.

A remaining concern is that the null result may reflect the dominance of narrative information over financial fundamentals at announcement rather than a genuine absence of market reaction to target leverage. To address this, the baseline specification is augmented with a news coverage indicator and a continuous headline sentiment score constructed using the Loughran-McDonald financial dictionary, as described in Section 3.4 and detailed in Annex D. Neither variable attains statistical significance across any of the three event

windows, and their inclusion leaves the leverage coefficient estimates essentially unchanged. The joint absence of leverage and sentiment effects supports a unified interpretation: the failure to price target capital structure at announcement is not explained by the substitution of narrative information for financial fundamentals but reflects a genuine horizon limitation in what announcement-period returns can capture.

4.2. Long-run market performance: buy-and-hold abnormal returns

Table 9 presents the regression results for buy-and-hold abnormal returns (BHARs) over 12-, 24-, and 36-month horizons following deal completion. The structure mirrors Table 8, with odd-numbered columns reporting baseline and even-numbered columns reporting extended specifications. The dependent variable is the winsorised BHAR in decimal form.

Table 9. OLS Regressions: Long-run BHAR Performance.

	BHAR 12m	**BHAR 12m**	**BHAR24m**	**BHAR 24m**	**BHAR 36m**	**BHAR 36m**
1 = Target Overleveraged	-0.189 *(0.232)*	-0.193 *(0.274)*	-0.202 *(0.290)*	-0.329 *(0.303)*	-0.451 *(0.456)*	-0.600 *(0.403)*
Target Leverage Deviation	0.729 *(0.498)*	0.763 *(0.562)*	0.376 *(0.460)*	0.800 *(0.522)*	0.956 *(0.744)*	1.614** *(0.719)*
Controls	Baseline	Extended	Baseline	Extended	Baseline	Extended
Observations	113	113	93	93	85	85
R-squared	0.033	0.053	0.072	0.169	0.070	0.260

Note. Dependent variable: buy-and-hold abnormal return (BHAR, decimal; 0.30 = +30%) over 12, 24, and 36 months post-completion. Coverage threshold: ≥ 83% of expected monthly observations. Sample restricted to underleveraged acquirers with non-missing target leverage and controls. Robust standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

At the 12- and 24-month horizons, no statistically significant relationship emerges between target leverage characteristics and long-run abnormal returns. At the 36-month horizon, the continuous measure of target leverage deviation is positive and statistically significant at the 5% level in the extended specification ($\beta = 1.614$, $p < 0.05$), while the target overleveraged indicator does not reach conventional significance thresholds. However, this result does not appear in the corresponding baseline specification and should therefore be interpreted as specific to the extended model rather than as a fully robust finding.

Capital structure adjustment following acquisitions is neither instantaneous nor costless, requiring the resolution of integration frictions, refinancing of existing obligations, and gradual rebalancing toward the combined firm's target leverage (Flannery & Rangan, 2006). The negative correlation between announcement-period CARs and 12-month BHARs documented in Table B.2. of Annex B reinforces this interpretation: short-run market

reactions and long-run restructuring gains are explained by distinct mechanisms operating at different horizons (Agrawal & Jaffe, 2003; Dessaint et al., 2025).

The positive coefficient on the continuous leverage deviation at the 36-month horizon provides suggestive evidence consistent with H2, indicating that greater target leverage deviation may be associated with stronger long-run abnormal returns. However, because significance is confined to the extended specification and only in this horizon, the evidence should be interpreted cautiously and viewed as indicative rather than conclusive. While the result should be interpreted cautiously, its sign is consistent with the mechanism proposed in Section 2. Because the deviation variable is signed, the positive coefficient implies that underleveraged acquirers generate higher 36-month returns when acquiring more overleveraged targets, and weaker returns when acquiring more underleveraged ones - consistent with financial flexibility being most productively deployed where restructuring opportunity is greatest (Harford et al., 2009; Morellec & Zhdanov, 2008).

This pattern is economically intuitive: the acquirer's preserved debt capacity is most productively deployed when it can be used to refinance, restructure, and reduce the distress risk of an overleveraged target, whereas combining two underleveraged firms forgoes the tax-shield and discipline benefits of additional leverage without offsetting restructuring gains (Flannery & Rangan, 2006; Harford et al., 2009; Morellec & Zhdanov, 2008).

Within the extended 36-month BHAR specification, the continuous leverage deviation is statistically significant while the overleveraged-target indicator is not. This pattern is consistent with H3, suggesting that a target's position along the leverage deviation spectrum may contain more information than its simple classification as overleveraged or underleveraged. However, because the result is confined to a single specification and because both variables remain significant in some accounting- and valuation-based outcomes, support for H3 should be regarded as partial rather than definitive. Consequently, the BHAR results provide suggestive support for H3, although the broader evidence across performance measures indicates that the relative importance of continuous and binary leverage representations remains outcome dependent.

4.3. Post-acquisition operating and valuation performance

Table 10 reports results for post-acquisition operating performance (ΔROA) and valuation (ΔTobin's Q) over one- and two-year post-deal horizons. Both outcomes are

defined relative to the pre-deal year t−1, as described in Section 3.2. All outcome variables are winsorised at the 1st and 99th percentiles.

Table 10. OLS Regressions: Operating and Valuation Performance.

	ΔROA t+1	**ΔROA t+1**	**ΔROA t+2**	**ΔROA t+2**	**ΔTQ t+1**	**ΔTQ t+1**	**ΔTQ t+2**	**ΔTQ t+2**
1 = Target Overleveraged	-0.064 *(0.041)*	-0.073* *(0.043)*	0.011 *(0.073)*	-0.052* *(0.027)*	0.068 *(0.363)*	-0.576* *(0.303)*	-0.095 *(0.356)*	-0.712** *(0.303)*
Target Leverage Deviation	0.104 *(0.082)*	0.161* *(0.086)*	-0.034 *(0.111)*	0.051 *(0.050)*	-0.291 *(0.648)*	1.418** *(0.609)*	0.011 *(0.689)*	1.679*** *(0.585)*
Controls	Baseline	Extended	Baseline	Extended	Baseline	Extended	Baseline	Extended
Observations	40	40	32	32	94	94	87	87
R-squared	0.133	0.326	0.115	0.723	0.023	0.462	0.013	0.499

Note. Dependent variables: post-deal change in ROA (ΔROA = EBIT/Assets, t+k minus t−1) and Tobin's Q (ΔTQ = [(MktCap+Debt)/Assets] at t+k minus t−1). Horizons t+1 (primary) and t+2 (robustness). Sample restricted to underleveraged acquirers with non-missing target leverage and controls. Winsorised at 1st–99th percentile. Robust standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

For post-acquisition operating performance, the evidence is limited and mixed. At the t+1 horizon, the target overleveraged indicator is negative and marginally significant only in the extended specification (coefficient = −0.073), while the continuous leverage deviation measure is positive and weakly significant in the same model (coefficient = 0.161). Neither effect appears consistently across specifications, and both weaken at the t+2 horizon.

Interpretation of the operating-performance results is further constrained by sample size. The ΔROA analyses are estimated on only 40 observations at t+1 and 32 observations at t+2. In particular, the extended ΔROA t+2 specification achieves an R^2 of 0.723 despite the limited number of observations and relatively large set of controls, raising concerns about overfitting and limited degrees of freedom. Consequently, any statistically significant coefficients in this specification should be viewed as illustrative rather than confirmatory evidence. Overall, the operating-performance results provide, at most, weak support for the proposed mechanism and should be interpreted with substantial caution.

The valuation results are more consistent with the long-run BHAR findings and provide partial support for H2 and H3. In the extended specification at t+1, the continuous leverage deviation measure is positive and significant at the 5% level (coefficient = 1.418), while the overleveraged target indicator is negative and marginally significant (coefficient = −0.576). At t+2, both effects strengthen: the deviation coefficient remains positive and becomes significant at the 1% level (1.679), while the indicator remains negative and significant at the 5% level (−0.712).

Tobin's Q is particularly well suited to capture this channel because of its forward-looking nature (Chung & Pruitt, 1994). Unlike the 36-month BHAR specification, where the binary indicator is not significant, both variables attain significance in the valuation setting. H3 is therefore only partially supported, as the binary classification retains explanatory power alongside the continuous measure.

The negative coefficient on the overleveraged indicator does not imply that acquiring overleveraged targets destroys value in absolute terms. Rather, the continuous deviation coefficient dominates economically. For an overleveraged target with a deviation of +0.30, the predicted effect at t+2 is $-0.712 + (0.30 \times 1.679) = -0.21$. For an underleveraged target with a deviation of −0.30, the predicted effect is approximately −0.50. Together, these estimates are consistent with a directional gradient in which underleveraged acquirers generate progressively stronger valuation gains as target leverage deviation increases, in line with the restructuring mechanism proposed in the theoretical framework (Barney, 1991; Harford et al., 2009; Morellec & Zhdanov, 2008).

Taken together, the valuation and long-run return results provide partial support for H2 and H3. The strongest evidence emerges from the valuation and long-run market-performance measures, whereas the operating-performance results remain weak, sensitive to specification choices, and constrained by limited sample sizes.

4.4. Robustness tests

Robustness checks assess the sensitivity of the main findings, organised across four dimensions further explored in Annex C. The first concerns leverage measurement: book leverage replaces market leverage to test sensitivity to mechanical co-movement with equity prices (Table C1) and a reduced-form target leverage model excluding market-to-book ratio and non-debt tax shields then tests whether the main findings depend on the completeness of the Frank and Goyal (2009) specification (Table C2).

Another robustness analysis concerns model specification: outcomes are re-estimated on unwinsorised samples to rule out sensitivity to outlier trimming (Table C3), and acquirer-region fixed effects are added to assess robustness to broad geographic heterogeneity (Table C4).

The third group of robustness tests addresses geographic heterogeneity more directly: the sample is partitioned into Asia-Pacific and Rest-of-World subgroups (Table C5) and

acquirer-country fixed effects provide the most granular geographic control available (Table C6).

Finally, the theoretical mechanism of this analysis is also examined by the signed leverage deviation being replaced with its absolute value to determine whether the effect operates through directional asymmetry or through distance from the optimum regardless of direction (Table C7).

Notwithstanding, before examining each issue, a multicollinearity diagnostic confirms that jointly including the directional indicator and the continuous deviation does not distort inference. Both variables share a common origin, producing VIFs of approximately 3, while all other regressors remain well below the conventional threshold of 5 to 10 (O'Brien, 2007). Correlation matrix results are additionally reported in Table B.2., Annex B.

Switching to book leverage (Table C1) eliminates the long-run signed leverage deviation effect: coefficients on both leverage variables are uniformly insignificant across market- and accounting-based performance outcomes. This is consistent with the well-established tendency of book leverage to be a noisier proxy for capital structure misalignment, absorbing less of the economically relevant variation that market leverage captures (Frank & Goyal, 2009; Welch, 2004). A significant coefficient does appear in one of the short-run CAR windows, but it is unstable across event widths and absent entirely at longer horizons, pointing to a mechanical result rather than a genuine leverage effect. The null result under book leverage thus supports the main specification.

The reduced-form target leverage model (Table C2) drops market-to-book ratio and non-debt tax shields - variables more prone to missingness in international samples - yielding an R^2 of 11.0% against 19.9% for the full specification. Across all performance outcomes, both leverage coefficients lose significance. This attenuation is better interpreted as a precision issue than as evidence against the main findings, since a noisier estimate of target leverage deviation mechanically widens standard errors and weakens the ability to detect the signed continuous leverage deviation effect.

Removing winsorisation from the outcome variables (Table C3) leaves the key results intact. In the 36-month BHAR specification, the target leverage deviation coefficient remains positive and significant at the 5% level, and the directional indicator retains its negative sign. The results are therefore not supported by extreme observations in the tails of the performance distribution.

Incorporating acquirer-region fixed effects (Table C4) to absorb broad geographic heterogeneity does not weaken the core result and in fact sharpens it: the continuous leverage deviation coefficient in the 36-month BHAR specification is positive and significant at the 5% level. The same directional pattern emerges for ΔTobin's Q. The leverage-performance relationship survives geographic partitioning and cannot be attributed to the compositional weight of any single region, including the Asia-Pacific observations that account for the majority of the sample.

Splitting the sample into Asia-Pacific and Rest-of-World subgroups (Table C5) allows a direct test of whether the effect is suggested by a single institutional context. In the Rest-of-World subsample, the leverage deviation coefficient on ΔTobin's Q is positive and statistically significant; in Asia-Pacific, the sign is consistent but precision falls as the within-region sample shrinks. For the 36-month BHAR, both subgroups yield directionally aligned coefficients. The result is therefore not a regional artefact, though the reduced within-group power means it should be interpreted with some caution outside the full-sample framework.

Country fixed effects (Table C6) apply the most granular geographic control available, absorbing all time-invariant country-level variation in financial systems, institutions, and capital market development. The leverage deviation coefficient on ΔTobin's Q remains positive and marginally significant, with the moderate precision loss relative to region fixed effects reflecting the thinner observation counts within country cells rather than any genuine instability in the underlying relationship.

The absolute-deviation robustness check (Table C7) examines whether the results persist once the directional component of target leverage deviation is removed. Replacing the signed leverage deviation with its absolute value collapses the distinction between overleveraged and underleveraged targets into a single measure of distance from optimal leverage irrespective of direction. Under this specification, the positive long-run coefficient observed in the main analysis disappears, suggesting that the effect is not due to leverage misalignment alone. This pattern is consistent with the interpretation that the target's signed position relative to its estimated optimum contains economically relevant information beyond absolute distance from the optimum. However, given the asymmetry of the leverage-matched sample (90 underleveraged versus 41 overleveraged targets), this evidence should be interpreted with caution, as the absolute-value specification may have lower statistical power to detect directional effects.

Taken together, the seven robustness checks reveal a consistent pattern. Announcement-period returns remain insensitive to target leverage characteristics across all specifications, while the positive relationship between signed continuous leverage deviation and long-run market-based performance persists across alternative leverage definitions, estimation approaches, outlier treatments, and geographic controls. Overall, the evidence partially supports the interpretation that post-acquisition capital structure adjustment, enabled by preserved financial flexibility, generates increasing long-run value as targets become progressively more overleveraged (DeAngelo et al., 2011; Flannery et al., 2023).

5. Discussion

5.1. Synthesis of findings

Three hypotheses structured the empirical analysis. Their resolutions are consistent and mutually reinforcing: target leverage misalignment is not priced at announcement but is consistent with long-run value creation through the continuous extent of leverage deviation rather than through its direction alone.

H1 predicted that announcement-period cumulative abnormal returns would be higher when underleveraged acquirers acquire underleveraged targets. The evidence provides no support for this prediction. Across all three event windows and both control specifications, neither the directional indicator for target overleveraging nor the continuous leverage deviation measure attains statistical significance. This is theoretically coherent: at announcement, investors lack the information required to assess how financial flexibility will be deployed, since those decisions depend on integration outcomes that remain unobservable at the time of deal disclosure (Harford et al., 2009). The sentiment diagnostic further confirms that the null result is not attributable to narrative information substituting for financial fundamentals, as neither media coverage nor the tone of deal-related news predicts announcement returns (Danbolt et al., 2015; Fu et al., 2019). Announcement-period CARs therefore reflect deal premia and near-term synergy expectations rather than balance-sheet restructuring potential (Ahmed & Elshandidy, 2020; Asquith, 1983).

H2 predicted that post-acquisition performance would increase with the continuous deviation of the target's leverage from its estimated optimum. This prediction receives partial support. The continuous leverage deviation is positive and significant in the 36-month BHAR specification, and ΔTobin's Q exhibits a positive and growing coefficient that strengthens from t+1 to t+2, consistent with a gradual capital structure adjustment process

(Flannery & Rangan, 2006; Harford et al., 2009). However, the continuous deviation does not attain significance at shorter BHAR horizons, and in the ΔROA specifications it is significant only marginally in the extended model at t+1. H2 is therefore supported most robustly at the 36-month horizon and in the valuation-based specifications and should not be read as a uniform result across all performance dimensions.

H3 predicted that the continuous leverage deviation would carry greater explanatory power than the binary directional classification. This is also only partially confirmed. In the 36-month BHAR specification, the binary indicator fails to attain significance while the continuous deviation remains significant, consistent with H3 (Korteweg, 2010). In the ΔTobin's Q specifications, however, both variables attain significance across t+1 and t+2, indicating that the direction of misalignment retains incremental explanatory power in the valuation setting. H3 holds most clearly at the furthest market-based horizon; in the accounting-based outcomes, the two variables carry overlapping information and neither fully displaces the other.

Together, the three findings converge on a unified conclusion: target leverage is not a short-run pricing signal but a long-run restructuring determinant, and the operative dimension of that signal is the continuous gradient of target leverage deviation, not the binary direction of misalignment.

5.2. Discussion and comparison with literature

The absence of a significant announcement effect is consistent with prior evidence showing that short-run M&A reactions primarily reflect deal completion probability, acquisition premia, and immediate synergy expectations rather than the scope for post-acquisition balance sheet restructuring (Ahmed & Elshandidy, 2020; Asquith, 1983).

Dynamic trade-off theory emphasises that capital structure adjustments materialise gradually and are shaped by integration frictions that only resolve over time (Flannery & Rangan, 2006; Harford et al., 2009), while takeover contest models suggest that announcement returns are induced primarily by bidding dynamics and perceived financing capacity rather than by the restructuring potential embedded in the target's balance sheet (Morellec & Zhdanov, 2008). The sentiment diagnostic reinforces this: the null result is not explained by narrative information substituting for financial fundamentals, confirming that the horizon limitation is genuine rather than a measurement confound (Danbolt et al., 2015; Liao et al., 2021).

The RBV offers a precise account of why financial flexibility cannot be priced at announcement. As a strategic resource, it generates value not through its existence but through the restructuring decisions it enables post-acquisition, and these decisions depend on integration outcomes that are unobservable at deal disclosure (Barney, 1991). The deployment context is simply not yet observable to the market.

The long-run results establish that the continuous extent of target leverage deviation is the operative dimension of post-acquisition performance. Blomkvist et al. (2022) show that acquirers strategically underleverage prior to acquisitions but do not examine whether performance gains depend on target characteristics. Flannery et al. (2023) establish that target capital structure shapes post-acquisition outcomes but do not separate the direction from the continuous extent of deviation. The present analysis bridges these perspectives: it is how far the target deviates from its leverage optimum - and in particular, how overleveraged it is - rather than simply which side of it the target sits on, that indicates long-run value creation.

This result is consistent across theoretical frameworks. Under dynamic trade-off theory, more overleveraged targets offer greater scope for value-enhancing capital structure adjustment following the acquisition (Flannery & Rangan, 2006; Harford et al., 2009). Under the takeover contest framework, the value of financial flexibility scales with the restructuring potential of the target, which is greatest when the target is furthest from its leverage optimum on the positive side (Morellec & Zhdanov, 2008). Under the RBV, a strategic resource generates returns in proportion to the richness of the context in which it is deployed, and a more overleveraged target provides precisely that context (Barney, 1991).

The absolute deviation robustness check anchors this interpretation empirically. When the signed leverage deviation is replaced by its absolute value, overleveraged and underleveraged targets at the same distance from the optimum become indistinguishable, and the long-run effect disappears. This confirms that direction is not incidental - what leads performance is not simply how far the target sits from its optimal leverage, but specifically how overleveraged it is.

5.3. Practical implications

The findings carry practical implications for how financial flexibility is evaluated in M&A practice.

For acquiring firms and their advisors, the results suggest that simply classifying targets as over- or underleveraged may provide an incomplete basis for identifying value

creation opportunities through capital structure adjustment. The evidence indicates that long-run value creation is stronger when underleveraged acquirers target firms with larger positive leverage deviations, suggesting that the extent of target misalignment provides information beyond the binary classification. Target screening may therefore benefit from incorporating estimates of leverage deviation alongside the strategic and operational metrics that dominate current due diligence practice (Welch et al., 2020). This implication should, however, be interpreted with caution given the sensitivity of the results to alternative leverage specifications.

For corporate boards and institutional investors, the findings reinforce the strategic role of preserving financial flexibility prior to acquisitions. Financial flexibility may support bidding capacity, alleviate financing constraints, and preserve balance sheet capacity for post-acquisition restructuring. However, its value appears conditional on deployment: maintaining excess financial capacity entails opportunity costs that are only justified when acquisition targets offer meaningful restructuring potential (DeAngelo et al., 2011). Underleveraging should therefore be evaluated not in isolation, but in light of the firm's acquisition strategy and the leverage characteristics of likely targets.

Finally, for investors and analysts assessing acquisition performance, the temporal structure of the results is critical. The potential benefits associated with capital structure adjustment appear to emerge gradually and are not reflected in announcement returns - a pattern reinforced by the sentiment diagnostic, which suggests that observable narrative signals carry little predictive power for short-run returns. Consequently, short-horizon evaluation frameworks may overlook aspects of value creation that materialise only over time, highlighting the importance of complementing immediate market reactions with longer-horizon performance assessments.

5.4. Policy implications

The finding that target leverage misalignment is associated with long-run M&A outcomes, yet is not reflected in announcement-period returns, may have implications for how managers, investors, and boards assess acquisition opportunities.

The information asymmetry documented in this study appears to operate primarily through financial fundamentals rather than narrative visibility. Key drivers of post-acquisition restructuring - including the target's leverage misalignment, the acquirer's intended financing strategy, and the expected capital structure of the combined entity - are

generally not disclosed in sufficient detail at announcement (Ortiz et al., 2023). As a result, investors may lack the information required to assess the restructuring potential embedded in a transaction at the time of deal disclosure. The sentiment diagnostic reinforces this interpretation: neither media coverage nor headline tone explains announcement-period returns, suggesting that the absence of short-run market reactions reflects limited visibility into the underlying financial adjustment process rather than insufficient market attention.

These findings suggest that current M&A disclosure frameworks may provide limited information about the post-deal financing and restructuring process. In particular, investors typically receive little detail regarding how the acquirer expects to refinance target liabilities, adjust leverage after completion, or finance future integration and restructuring costs (Ortiz et al., 2023). Greater transparency around these dimensions could help markets assess the long-run implications of acquisitions more effectively and reduce the information asymmetry identified in this study (Ahmed & Elshandidy, 2020). Even qualitative disclosure regarding intended post-acquisition leverage policies and financing strategy could improve investors' ability to evaluate restructuring potential at announcement.

The international composition of the sample also has implications for the interpretation of the findings. Approximately 70% of the observations originate from Asia-Pacific markets, meaning the documented leverage-adjustment channel is identified primarily within the institutional and regulatory environments represented in those economies. Although the main findings remain robust across regional specifications, capital structure adjustment dynamics may differ across jurisdictions with distinct disclosure standards, governance regimes, creditor protections, and capital market structures. As a result, the magnitude and timing of post-acquisition restructuring gains may vary across institutional settings.

From a governance perspective, the findings highlight a practical distinction that boards and institutional investors should take seriously: deliberate strategic underleveraging is not the same as an unintended leverage shortfall. The former reflects a purposeful policy that preserves acquisition capacity and provides the conditions for post-deal restructuring; the latter may carry none of those benefits. Governance frameworks that require boards to explain how their leverage position relates to their acquisition pipeline, and whether that flexibility is strategic or simply accidental, would improve accountability and give institutional investors a clearer basis for evaluating capital structure decisions (Blomkvist et al., 2022; Graham & Harvey, 2001).

Finally, the results highlight the importance of distinguishing between short-run market reactions and long-run restructuring outcomes when evaluating M&A activity. Announcement-period returns in this study contain little information about the future performance effects of target leverage misalignment, whereas the restructuring channel becomes economically meaningful only over longer horizons, particularly at the 36-month horizon. This suggests that short-run market reactions may not fully capture the long-run value implications of acquisitions involving financially flexible acquirers and materially misleveraged targets. Policymakers and regulators should therefore exercise caution when interpreting announcement effects as a sufficient indicator of deal quality or economic welfare.

5.5. Limitations

Five limitations bear on the interpretation of the findings, varying in their consequence for the main conclusions.

The most significant limitation concerns the absence of a formal causal identification strategy and the resulting selection bias in the acquisition sample. Because acquisitions are strategic rather than random events, underleveraged acquirers may systematically select targets whose leverage profiles already signal future improvement. In such cases, the positive association between target leverage deviation and post-acquisition performance may partly reflect screening ability rather than the causal effect of deploying financial flexibility to restructure a misaligned target. This form of selection on unobservables cannot be eliminated through conventional controls, while instrumental variable estimation would require a valid instrument that is difficult to identify in this cross-sectional international setting. The findings should therefore be interpreted as evidence of a robust association between target leverage misalignment and post-acquisition value creation, rather than definitive proof of a causal mechanism (Harford et al., 2009).

The second limitation concerns the estimation of optimal leverage. The pooled OLS framework of Frank and Goyal (2009) captures common leverage dynamics across firms and years but may not fully reflect firm-specific strategic behaviour or industry-specific determinants of capital structure. As a result, the estimated leverage deviation variable may contain measurement noise, reducing the precision of the empirical specifications and making underlying relationships more difficult to detect statistically. This pattern is reflected in the reduced-form specification in Section 4.4, where excluding relevant leverage

determinants leads to weaker and less stable results. Future research could therefore explore alternative approaches to estimating optimal leverage (Hovakimian et al., 2004; Ozkan, 2001).

The third limitation concerns the operating performance specifications, which rely on comparatively small estimation samples. The ΔROA regressions include only 40 observations at the one-year horizon and 32 at the two-year horizon, limiting statistical power and increasing sensitivity to individual observations. As a result, the operating-performance findings should be interpreted with caution. By contrast, the BHAR and Tobin's Q specifications benefit from substantially broader sample coverage, allowing for more reliable inference regarding long-run post-acquisition performance.

Nevertheless, although BHARs are widely used in the acquisition-performance literature, they are sensitive to skewness and cross-sectional dependence, particularly when transactions cluster within similar calendar periods. This issue may be also relevant in the present sample given the concentration of transactions around 2021. Consequently, conventional heteroskedasticity-robust standard errors may understate the true sampling uncertainty and overstate statistical significance. While the positive association between target leverage deviation and 36-month BHAR performance remains economically meaningful and consistent with the theoretical framework developed in this study, the statistical inference should be interpreted with appropriate caution. Future research could assess the robustness of these findings using skewness-adjusted test statistics, bootstrap procedures, or calendar-time portfolio approaches (Lyon et al., 1999).

The sample is concentrated in Asia-Pacific, which accounts for approximately 70% of underleveraged-acquirer observations. Robustness tests with region and country fixed effects confirm the main findings are not supported by this concentration. However, the small within-region samples outside Asia-Pacific limit the ability to assess whether the magnitude of the effect varies across institutional environments with distinct financial systems, governance structures, and capital market development (Gungoraydinoglu & Oztekin, 2011).

Finally, the 2014–2024 sample period spans markedly different macroeconomic conditions, which may have affected leverage dynamics and capital structure adjustment behaviour in ways that a cross-sectional framework cannot fully absorb (Riddiough & Zhang, 2025).

Despite these limitations, the consistency of the findings across alternative specifications, leverage definitions, and robustness tests supports the central interpretation of the study.

5.6. Avenues for future research

The findings open several productive directions. The most direct extension would be to track the post-acquisition leverage path of the combined entity, rather than inferring the adjustment channel indirectly through performance outcomes. This would allow a more direct test of whether performance gains are associated with the speed and extent of convergence toward the combined firm's optimal leverage, as predicted by dynamic trade-off theory (Khoo et al., 2015). A methodological precedent for this approach is provided by De La Bruslerie and Enache (2023), who examine the leverage trajectory of newly controlled target firms following acquisition.

A second direction concerns heterogeneity in the leverage-adjustment relationship identified in this study. Although the analysis documents an aggregate effect, the performance implications of target leverage misalignment are unlikely to be uniform across transactions. Factors such as takeover competition, target governance quality, operational overlap between acquirer and target, and the acquirer's degree of financial flexibility may all influence how effectively post-acquisition restructuring gains are realised (Morellec & Zhdanov, 2008). Exploring these moderating mechanisms would help identify the conditions under which financial flexibility generates the strongest long-run performance effects.

Third, the role of deal financing structure deserves further investigation. Cash-financed acquisitions require the more immediate deployment of acquirer debt capacity than stock-financed transactions, suggesting that the restructuring effects identified in this study may be stronger in cash deals (Ang et al., 2019). Future research could also examine how increasingly complex financing arrangements - including special purpose vehicles (SPVs) and layered debt structures - affect both the measurement of acquirer financial flexibility and the post-acquisition leverage adjustment process (De La Bruslerie & Enache, 2023; Flannery et al., 2023).

Fourth, the sentiment diagnostic introduced in this study provides a direct avenue for future research. The present analysis relies on headline-level information from Google News, capturing the signals most immediately visible to market participants at announcement. Future work could extend this approach to richer textual sources, including

earnings call transcripts, investor presentations, and regulatory filings, to assess whether more detailed communication regarding post-acquisition leverage policy reduces the divergence between short-run market reactions and long-run performance. Such evidence would provide a more direct test of the information asymmetry mechanism proposed in Section 5.4 and help clarify whether strategic communication regarding financial flexibility can influence how capital markets evaluate acquisitions at announcement (Ahern & Sosyura, 2014; Hajek & Henriques, 2024; Myers & Majluf, 1984).

6. Conclusion

This study provides novel international evidence that long-run M&A value creation for strategically underleveraged acquirers depends primarily on the continuous leverage deviation of the target firm rather than on a simple binary classification of targets as over- or underleveraged.

The evidence is consistent with three complementary theoretical perspectives. Dynamic trade-off theory predicts that larger leverage deviations lead to greater scope for post-acquisition capital structure adjustment and gradual convergence toward the combined-firm optimum (Flannery & Rangan, 2006; Harford et al., 2009). Takeover contest theory frames financial flexibility as a strategic resource that enhances acquisition and restructuring capacity when targets exhibit greater leverage misalignment (Morellec & Zhdanov, 2008). The Resource-Based View further suggests that financial flexibility leads to promising results not through its mere existence, but through its deployment in contexts where it can be converted into competitive outcomes (Barney, 1991).

Three contributions emerge from this analysis. First, the study distinguishes between the directional and continuous representations of target leverage misalignment. The evidence suggests that these measures do not convey identical information and that their relative relevance depends on the performance dimension considered. While the continuous deviation appears more closely associated with long-run shareholder returns, both measures contribute to explaining certain post-acquisition operating and valuation outcomes. Second, the study brings together three previously distinct strands of literature - dynamic trade-off theory, takeover contest theory, and research on the contribution of target capital structure to post-acquisition performance - within a single empirical framework. The Resource-Based View complements this perspective by framing financial flexibility as a strategic resource that may facilitate post-acquisition restructuring and value creation. Third, the findings remain

broadly robust across alternative leverage measures, target-leverage estimation procedures, and geographic control specifications. Although some relationships weaken under specific robustness tests, the overall pattern of evidence suggests that target leverage misalignment contains information relevant to post-acquisition performance beyond a simple binary classification.

The broader implication is that financial flexibility is not a passive buffer but a strategic resource whose value depends on how it is deployed. Underleveraged acquirers generate stronger long-run performance when they direct preserved debt capacity toward targets offering genuine restructuring opportunities, rather than merely maintaining borrowing capacity (Flannery & Rangan, 2006; Harford et al., 2009; Morellec & Zhdanov, 2008). The findings suggest that target screening should move beyond binary leverage classifications and consider the continuous distance between actual and optimal leverage. More broadly, the results highlight a closer connection between capital structure and M&A research, showing that financing decisions made years before a transaction can shape the ability to generate value through acquisition.

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Annex

Table of Contents

List of Tables

List of Figures

A - Data Construction and Sample Selection

The empirical sample is constructed by combining deal-level information from Orbis M&A with firm-level market and accounting data retrieved from LSEG. The initial deal-level dataset comprises 862 completed transactions announced between 2014 and 2024 after manual cleaning steps as described in Table 1. For each deal, the ISIN identifiers of both the acquirer and the target are extracted, yielding 1,724 deal-side identifiers. These identifiers are then matched to the LSEG universe of publicly listed firms, which includes 50,889 companies after excluding financials and utilities. This matching procedure serves to identify which firms have available market and accounting data; importantly, it does not reduce the number of deals, but instead determines data availability at the firm level, with missing observations arising in subsequent steps.

A first reduction in the deal sample occurs through the application of deal-level filters. Transactions with a deal value below USD 1 million are excluded to ensure economic relevance, and deals lacking valid ISIN identifiers for either the acquirer or the target are removed to guarantee consistent data linkage. These restrictions reduce the sample from 862 to 650 deals. The dataset is subsequently reshaped into long format, such that each transaction contributes two observations, one corresponding to the acquirer and one to the target, resulting in 1,300 firm-deal observations. This structure facilitates the merging of deal information with firm-level data.

Firm-level data are then integrated from LSEG. Stock return data are obtained externally via the LSEG Data Library for Python, including daily returns for the computation of announcement-period abnormal returns (CARs) and monthly returns for the construction of buy-and-hold abnormal returns (BHARs), alongside benchmark returns, the iShares MSCI ACWI ETF (NASDAQ). Accounting and valuation variables are retrieved using the LSEG Excel add-in. The merging procedure is performed at the firm-date level and does not induce further sample reduction; instead, it introduces variation in data availability across variables, as not all firms have complete coverage over all required time horizons.

Prior to imposing the research design restrictions, data availability differs substantially across variables. Among the 650 deals, acquirer leverage is available for 413 observations and target leverage for 329. Market-based measures exhibit broader coverage: 418 deals provide sufficient daily return data to compute announcement-period abnormal returns, while 444, 393, and 357 deals support the computation of buy-and-hold abnormal returns over the 12-, 24-, and 36-month horizons, respectively. In contrast, accounting-based

measures are more limited, with 139 and 121 deals providing sufficient data to compute changes in return on assets at t+1 and t+2, and 347 and 296 deals allowing for the computation of changes in Tobin's Q over the same horizons. These differences reflect the varying data requirements across outcome variables, particularly the need for longer time series in the case of long-run and post-deal performance measures.

The empirical analysis focuses on acquisitions undertaken by underleveraged acquirers, defined as firms whose pre-deal leverage falls below their estimated target level. Imposing this restriction reduces the sample from 650 to 226 deals. The final estimation samples are then obtained as the intersection of three key conditions: (i) the acquirer is underleveraged, (ii) the target's leverage deviation is observable, and (iii) the relevant outcome variable is available. Because each outcome variable requires different data inputs and time horizons, the resulting sample size varies across specifications. The final sample comprises 118 deals for the analysis of announcement-period abnormal returns; 113, 93, and 85 deals for buy-and-hold abnormal returns over the 12-, 24-, and 36-month horizons, respectively; 40 and 32 deals for changes in return on assets at t+1 and t+2; and 94 and 87 deals for changes in Tobin's Q over the same horizons. These figures correspond to the maximum number of observations satisfying the full set of conditions required for each empirical specification.

B – Exploratory Data Analysis

This section presents exploratory figures and the main estimation and correlation tables referenced in the empirical approach and results sections of the study.

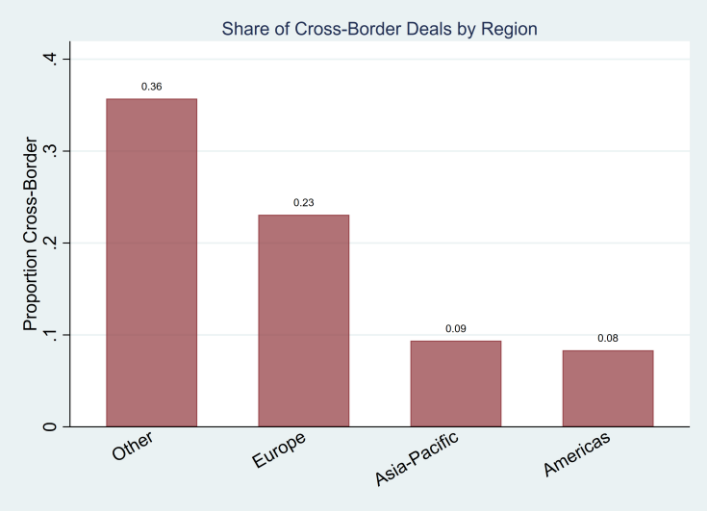

Figure B. 1. Share of Cross-Border Deals by Acquirer Region. Sample: underleveraged acquirers.

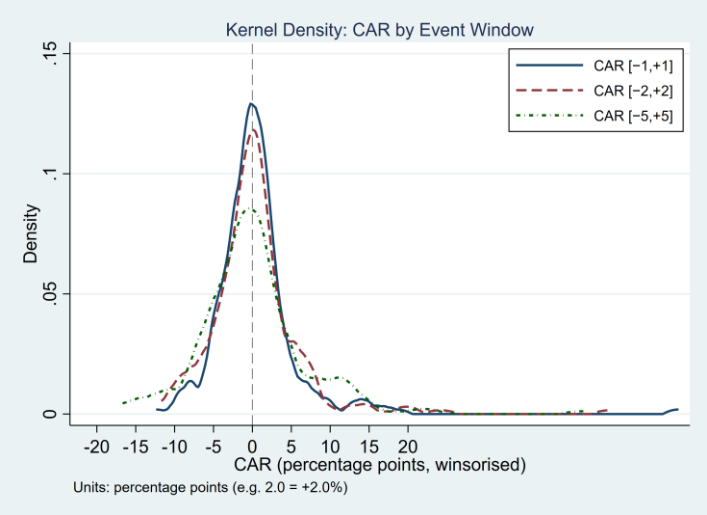

Figure B. 2. Kernel density of CARs across all three event windows ([−1,+1], [−2,+2], [−5,+5]).

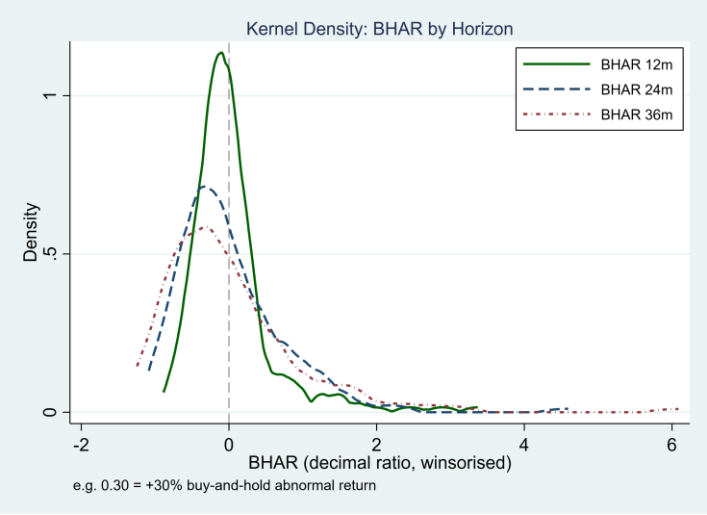

Figure B. 3. Kernel density of BHARs across three horizons (12m, 24m, 36m). N varies by horizon.

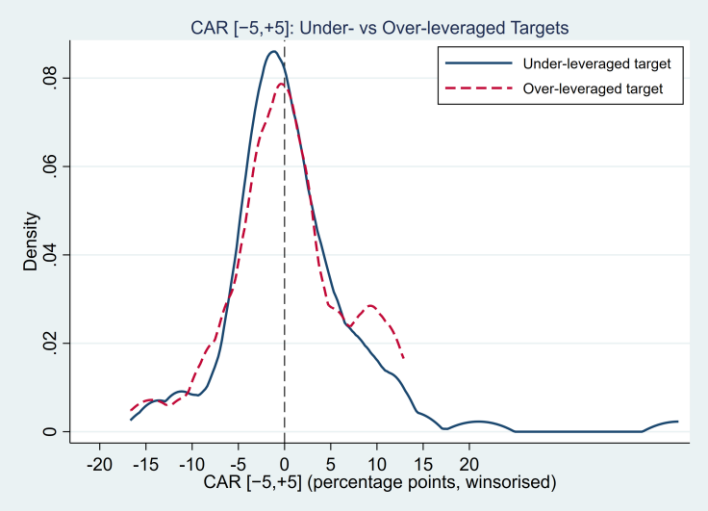

Figure B. 4. Kernel density of CAR [−2,+2] by target leverage group. Solid: underleveraged; dashed: overleveraged.

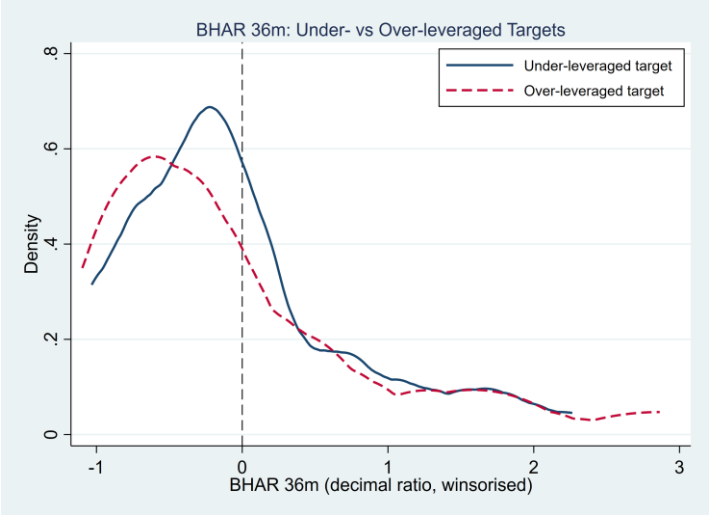

Figure B. 5. Kernel density of BHAR +1 to +24m by target leverage group.

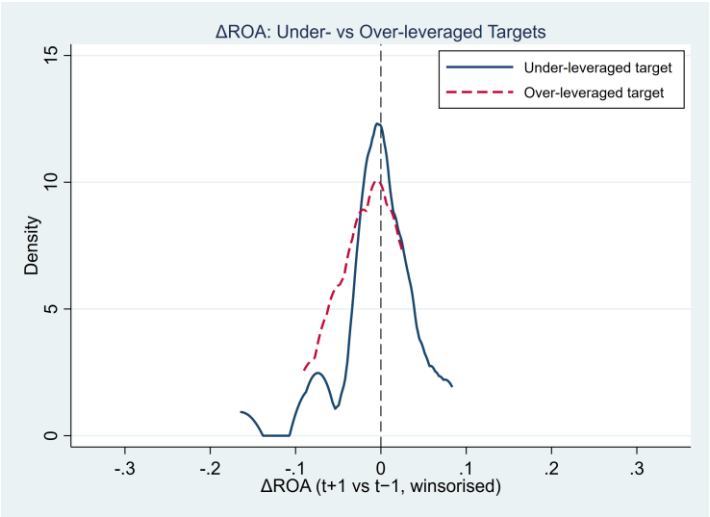

Figure B. 6. Kernel density of BHAR +1 to +36m by target leverage group.

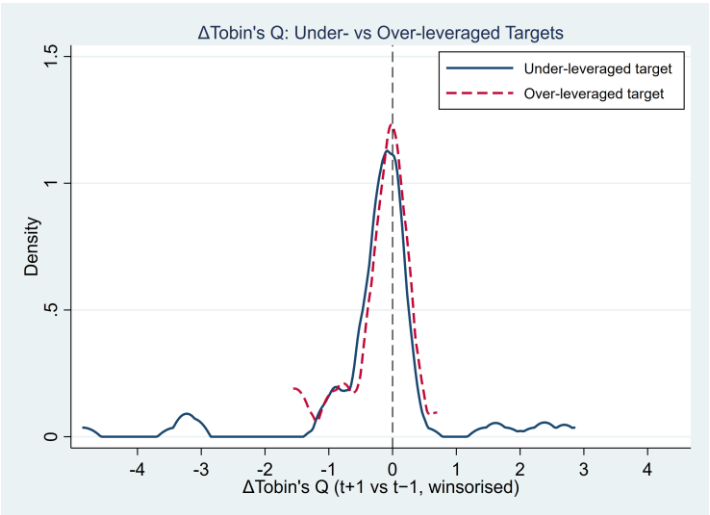

Figure B. 7. Kernel density of ΔROA (t+1 vs t−1) by target leverage group.

Table B. 1. Target Market Leverage L* Regressions.

	Full specification		Reduced specification	
logTA	0.014***	*(0.001)*	0.015***	*(0.001)*
tangibility	0.214***	*(0.012)*	0.213***	*(0.012)*
profitability	-0.371***	*(0.021)*	-0.266***	*(0.017)*
MTB	-0.018***	*(0.001)*		
NDTS	-0.769***	*(0.092)*		
Year FE	Yes		Yes	
Observations	6,882		7,138	
R-squared	0.199		0.110	
F-statistic	100.46		58.58	

Note. OLS regressions of market-leverage ratio on firm characteristics, estimated on the full LSEG universe (excluding financial and utility firms), 2012–2024. Includes fixed effects. Reduced specification drops MTB and NDTS. Robust standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01

Table B. 2. Pairwise Pearson Correlation Matrix.

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) CAR [-1,+1]	1.000											
(2) CAR [-5,+5]	0.910***	1.000										
(3) BHAR 12m	-0.371*	-0.430*	1.000									
(4) BHAR 36m	-0.264	-0.320	0.676***	1.000								
(5) ΔROA(t+1 vs t-1)	0.007	-0.061	0.556***	0.562***	1.000							
(6) ΔTQ(t+1 vs t-1)	0.020	-0.055	0.295	0.602***	0.498**	1.000						
(7) Target Leverage Deviation	-0.363*	-0.308	0.038	0.004	0.076	-0.031	1.000					
(8) Acquirer Leverage Deviation	-0.525**	-0.444*	0.125	-0.060	-0.083	0.110	0.158	1.000				
(9) Log (Deal Value)	0.304	0.225	-0.277	-0.140	-0.111	0.129	0.045	-0.122	1.000			
(10) Relative Deal Size (Deal Value / Market Cap.)	0.899***	0.754***	-0.325	-0.269	0.063	-0.017	-0.378*	-0.636***	0.434*	1.000		
(11) Cross Border Deals	-0.158	-0.146	-0.133	-0.258	-0.107	-0.057	0.327	0.094	-0.056	-0.138	1.000	
(12) Overleveraged Targets	-0.125	-0.105	-0.078	-0.039	-0.028	-0.045	0.785***	-0.203	0.294	-0.015	0.218	1.000

Note. N varies by variable pair due to missing data. CARs in percentage points; BHARs in decimal ratios; Overleveraged Target is binary (1 = target above predicted L*). Target's and Acquirers' Leverage Deviation are market-leverage deviations for target and acquirer, respectively. * p<0.05, ** p<0.01, *** p<0.001.

Table B2 presents pairwise Pearson correlations among the main variables. Short-run performance measures are highly consistent with one another: CAR [−1,+1] and CAR [−5,+5] exhibit a correlation of 0.910 ($p < 0.001$), reflecting the overlap in event windows

and confirming the internal coherence of the event-study measures (Asquith, 1983). Target leverage deviation is significantly negatively correlated with announcement returns ($r = -0.363$, $p < 0.05$ for CAR [−1,+1]), indicating that deals involving more overleveraged targets are associated with weaker market reactions at announcement. Acquirer leverage deviation displays an even stronger negative association with CARs ($r = -0.525$, $p < 0.01$), consistent with the possibility that more underleveraged acquirers are associated with more favourable market reactions (Ahmed & Elshandidy, 2020).

Relative deal size exhibits an exceptionally strong positive correlation with short-run CARs ($r = 0.899$, $p < 0.001$), suggesting that larger deals relative to acquirer size generate substantially stronger market reactions (Harford et al., 2009). CAR [−1,+1] is negatively correlated with $BHAR_{12}$ ($r = -0.371$, $p < 0.05$), consistent with partial mean-reversion of announcement-period reactions over longer horizons (Agrawal & Jaffe, 2003). Among long-run measures, $BHAR_{12}$ and $BHAR_{36}$ are strongly positively correlated ($r = 0.676$, $p < 0.001$), and both are positively associated with ΔROA ($r = 0.556$ and 0.562) and ΔTobin's Q ($r = 0.295$ and 0.602), confirming that the various long-run performance dimensions are related but capture distinct aspects of value creation. Notably, neither acquirer's nor targets' leverage deviation show a statistically significant correlation with any long-run outcome variable, confirming that leverage effects are conditional on other deal and firm characteristics and can only be identified in a multivariate framework.

C – Robustness Tests Results

This section reports the results of seven robustness checks assessing the sensitivity of the main findings to alternative leverage definitions, sample construction choices, and geographic controls, as described in Section 4.4 of the study.

Table C. 1. Robustness: Book Leverage Deviation.

	CAR [-1,+1]	**CAR [-5,+5]**	**BHAR 12m**	**BHAR 36m**	**ΔROA**	**ΔTQ**
1 = Target overleveraged (book leverage)	4.135*	2.978	0.022	0.188	0.044*	0.220
	(2.143)	*(2.498)*	*(0.230)*	*(0.359)*	*(0.024)*	*(0.348)*
Target leverage deviation (book)	-16.465***	-11.003	0.240	0.081	-0.129	-0.680
	(6.251)	*(7.290)*	*(0.494)*	*(1.075)*	*(0.104)*	*(0.812)*
Observations	118	118	113	85	40	94
R-squared	0.403	0.321	0.032	0.218	0.233	0.437

Note. Replicates the main extended specification replacing market leverage deviation with book leverage deviation. Robust standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

Table C. 2. Robustness: Reduced-form L* (excl. MTB and NDTS).

	CAR [-1,+1]	CAR [-5,+5]	BHAR 12m	BHAR 36m	ΔROA	ΔTQ
1 = Target overleveraged (reduced L*)	0.214	-1.391	-0.176	-0.312	-0.040	-0.276
	(2.582)	*(2.522)*	*(0.248)*	*(0.429)*	*(0.038)*	*(0.266)*
Target leverage deviation (reduced L*)	-4.665	0.737	0.662	0.709	0.068	0.393
	(5.178)	*(5.627)*	*(0.571)*	*(0.722)*	*(0.086)*	*(0.469)*
Observations	119	119	114	86	40	95
R-squared	0.378	0.311	0.046	0.216	0.212	0.439

Note. Replicates the main extended specification using target leverage deviation derived from the reduced L* model (logTA, tangibility, profitability, and year FE only; R^2 = 11.0%, N = 7,138). Robust standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

Table C. 3. Robustness: No Winsorisation of Outcome Variables.

	CAR[-1,+1]	CAR[-5,+5]	BHAR 12m	BHAR 36m
1 = Target Overleveraged	0.979	-0.117	-0.193	-0.600
	(2.906)	*(2.638)*	*(0.274)*	*(0.403)*
Target Leverage Deviation	-5.160	-1.405	0.763	1.614**
	(6.226)	*(6.116)*	*(0.562)*	*(0.719)*
Observations	118	118	113	85
R-squared	0.432	0.371	0.053	0.260

Note. Replicates the extended specification using raw (unwinsorised) outcome variables. Operating performance outcomes (ΔROA, ΔTQ) excluded from this check as their distributions are dominated by outliers in the absence of winsorisation. Robust standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

Table C. 4. Robustness: Acquirer-Region Fixed Effects.

	CAR[-1,+1]	CAR[-5,+5]	BHAR 12m	BHAR 36m	ΔROA	ΔTQ
1 = Target Overleveraged	0.452	-0.305	-0.285	-0.784*	-0.078	-0.606
	(2.521)	*(2.483)*	*(0.328)*	*(0.461)*	*(0.051)*	*(0.369)*
Target Leverage Deviation	-3.784	-0.851	0.944	2.015**	0.171	1.380*
	(5.589)	*(5.925)*	*(0.645)*	*(0.839)*	*(0.105)*	*(0.726)*
Region FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	118	118	113	85	40	94
R-squared	0.419	0.372	0.091	0.285	0.332	0.480

Note. Adds acquirer-region fixed effects (Americas, Asia-Pacific, Europe, Other) to the extended specification. Motivated by the Asia-Pacific concentration of the sample (69.5% of observations). Robust standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

Table C. 5. Robustness: Asia-Pacific vs Rest of World Sub-Sample.

	BHAR 36m		ΔTobin's Q	
	Asia-Pacific	Rest of World	Asia-Pacific	Rest of World
1 = Target Overleveraged	-0.909	-0.012	-0.449	-0.250
	(0.597)	*(0.331)*	*(0.368)*	*(0.256)*
Target Leverage Deviation	2.034	0.870	0.876	0.853**
	(1.272)	*(0.650)*	*(0.795)*	*(0.405)*
Observations	56	29	64	30
R-squared	0.235	0.679	0.607	0.406

Note. Extended specification estimated separately for Asia-Pacific and Rest-of-World sub-samples. Only outcomes with sufficient within-region variation are reported (BHAR 36m and ΔTobin's Q). Sample restricted to underleveraged acquirers. Robust standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

Table C. 6. Robustness: Acquirer-Country Fixed Effects.

	CAR[-1,+1]	CAR[-5,+5]	BHAR 12m	BHAR 36m	ΔROA	ΔTQ
1 = Target Overleveraged	0.852	-0.688	-0.394	-0.812	-0.055	-0.548
	(3.127)	*(3.457)*	*(0.336)*	*(0.711)*	*(0.052)*	*(0.383)*
Target Leverage Deviation	-7.320	-1.469	0.782	2.193	0.090	1.410*
	(6.620)	*(7.890)*	*(0.676)*	*(1.450)*	*(0.124)*	*(0.801)*
Observations	118	118	113	85	40	94
R-squared	0.582	0.475	0.572	0.422	0.917	0.682

Note. All specifications include acquirer-country fixed effects, absorbing any time-invariant country-level heterogeneity. The high R^2 for ΔROA (0.917) reflects near-complete absorption by country effects in the small operating-performance sub-sample (N = 40). Sample restricted to underleveraged. Robust standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

Table C. 7. Robustness: Long-run BHAR performance considering absolute target leverage deviation.

	BHAR12	BHAR12	BHAR24	BHAR24	BHAR36	BHAR36
1 = Target	0.138	0.139	-0.013	0.019	0.023	0.086
Overlevered	*(0.160)*	*(0.161)*	*(0.157)*	*(0.165)*	*(0.236)*	*(0.233)*
|Target Leverage	-1.016**	-0.933**	-0.847*	-0.807	-1.432**	-0.902
Deviation|	*(0.396)*	*(0.406)*	*(0.469)*	*(0.530)*	*(0.672)*	*(0.687)*
Controls	Baseline	Extended	Baseline	Extended	Baseline	Extended
Observations	113	113	93	93	85	85
R-squared	0.046	0.060	0.092	0.167	0.091	0.221

Note. Dependent variable: buy-and-hold abnormal return (decimal; 0.30 = +30%) over 12, 24, and 36 months post-completion. Coverage threshold: n12≥10, n24≥20, n36≥30 monthly observations required. Sample restricted to underleveraged acquirers. Robust standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

D – Market Sentiment Textual Analysis

The short-run results reported in Section 4.1 provide no support for H1, with announcement-period cumulative abnormal returns showing no significant association with target leverage characteristics. Before interpreting this null result as evidence of market inefficiency or data limitations, it is worth ruling out a competing explanation: that announcement-period returns are systematically determined by the narrative information environment (media coverage and investor sentiment), rather than by underlying financial fundamentals. This section presents a supplementary analysis designed to assess this possibility and thereby sharpen the interpretation of the H1 findings.

The analysis is motivated by a growing body of literature documenting that short-run market reactions in M&A are shaped by informational frictions, media attention, and the tone of financial coverage (Danbolt et al., 2015; Liao et al., 2021; Fu et al., 2019). If sentiment or news visibility systematically predicts announcement returns, the null H1 result would reflect the dominance of narrative over fundamentals rather than a genuine absence of market reaction. Conversely, if neither channel is significant, the null result is more credibly

attributed to announcement-period CARs being an inherently incomplete signal of value-relevant information at the time of deal disclosure (Ahmed & Elshandidy, 2020).

The starting point is the full initial sample of 862 M&A transactions retrieved from the Orbis M&A database (Table 1). For each deal, news headlines are collected using a Python-based procedure that queries Google News using combinations of acquirer name, target name, and transaction-specific keywords, including "acquisition", "target + acquire", and "acquirer + acquisition".

Rather than relying solely on formal regulatory disclosures, the analysis focuses on the broader information set realistically observable by market participants at announcement, encompassing financial media, press releases, and company announcements as indexed by Google News. The raw output produces a deal-level dataset containing a deal identifier, a binary indicator of news coverage, and the textual content of retrieved headlines, which is subsequently merged with the main Stata dataset using the deal identifier. All sample restrictions applied to the main CAR regressions are replicated, yielding a final estimation sample of 118 deals.

Two variables are constructed from this dataset. The first is a binary equal to one if at least one relevant headline was retrieved for the deal, and zero otherwise. This variable captures deal visibility and proxies for investor attention. Within the estimation sample, 98 transactions (83.1%) are associated with at least one headline, while 20 (16.9%) exhibit no identifiable media coverage, preserving sufficient variation to identify the effect of information availability.

The second variable is a continuous measure of the tone of deal-related coverage, constructed using the Loughran–McDonald financial dictionary (Loughran & McDonald, 2015; Loughran & McDonald, 2020), which classifies individual words as positive, negative, or uncertain in a financial context. For each headline, a raw sentiment score is computed as the difference between the count of positive and negative words; headline-level scores are then averaged across all headlines associated with a given deal to produce the deal-level measure. Deals without news coverage are assigned a sentiment value of zero, ensuring that the absence of information is explicitly modelled rather than excluded from the analysis.

Two measurement choices warrant brief clarification. Headline-level scores are not normalised by total word count, as M&A-related financial headlines tend to be structurally similar in length, limiting the risk of length-driven bias across observations. Additionally, the dataset is constructed at the level of headlines rather than full article text, reflecting the

information most immediately available to market participants at announcement (Hajek & Henriques, 2024).

The baseline CAR specification from Section 3.4 is augmented to include these two variables alongside the original deal and acquirer controls, and estimated separately for the CAR(−1,+1), CAR(−2,+2), and CAR(−5,+5) event windows. The coefficient on sentiment captures whether the tone of coverage predicts announcement returns; the coefficient on news dummy captures whether deal visibility matters independently of tone. If informational frictions explain the null H1 result, at least one of these coefficients should be statistically significant.

The results provide no evidence supporting either channel. Across all three event windows, neither variable is statistically significant at conventional levels. The continuous variable coefficient ranges from −1.453 in the CAR(−2,+2) window to 1.614 in the CAR(−1,+1) window, with standard errors of approximately 3.2 to 3.5 percentage points, yielding t-statistics well below conventional thresholds. The dummy coefficient is similarly negligible, ranging from −0.386 to 0.748 and statistically indistinguishable from zero across all specifications. These magnitudes are economically small relative to the variation in announcement returns and to the coefficients on the main deal-level controls.

Table D. 1. Market sentiment analysis (with and without the two additional variables).

	(1) CAR [-1,+1]	(2) CAR [-1,+1]	(3) CAR [-2,+2]	(4) CAR [-2,+2]	(5) CAR [-5,+5]	(6) CAR [-5,+5]
Overleveraged Targets	0.140	0.328	0.618	0.384	-0.641	-0.613
	(2.514)	(2.425)	(2.525)	(2.417)	(2.494)	(2.461)
Target's Leverage Deviation	-3.005	-3.322	-3.310	-2.863	-0.0672	-0.144
	(5.277)	(5.216)	(5.378)	(5.299)	(5.728)	(5.792)
Log (Deal Value)	0.754*	0.751*	0.672*	0.653*	0.485	0.496
	(0.397)	(0.418)	(0.375)	(0.386)	(0.378)	(0.390)
Relative Deal Size (Deal Value/Market Cap)	-1.424***	-1.411**	-1.300***	-1.308***	-1.539***	-1.542***
	(0.538)	(0.553)	(0.450)	(0.458)	(0.397)	(0.403)
Cash Financed Deals	-0.154	0.0229	-0.273	-0.391	0.222	0.193
	(0.949)	(0.977)	(0.983)	(1.008)	(1.136)	(1.205)
Log (Total Assets)	-0.269*	-0.271	-0.301*	-0.316*	-0.141	-0.132
	(0.159)	(0.168)	(0.167)	(0.170)	(0.198)	(0.207)
Acquirer's Leverage Deviation	-7.525	-7.931	-2.717	-2.585	-2.650	-2.507
	(6.667)	(6.454)	(6.311)	(6.101)	(6.929)	(6.883)
Profitability of Acquirers (as in Table 3)	-23.72**	-23.24**	-21.52**	-21.62**	-25.22***	-25.42***
	(10.88)	(11.57)	(9.344)	(9.726)	(8.478)	(8.917)
MTB of acquirers (as in Table 3)	0.307	0.307	0.253	0.237	0.379	0.388
	(0.288)	(0.302)	(0.247)	(0.252)	(0.262)	(0.270)
Cross Border Deals	-3.506***	-3.531***	-3.212***	-3.162***	-4.558***	-4.572***
	(1.063)	(1.091)	(1.123)	(1.103)	(1.351)	(1.378)

Sentiment		1.614		-1.453		-0.0591
		(3.215)		(3.502)		(3.382)
News Existence		-0.0433		0.748		-0.386
		(1.120)		(1.184)		(1.604)
Constant (Intercept)	6.020	5.833	7.241	7.309*	4.282	4.344
	(4.341)	(4.331)	(4.530)	(4.354)	(4.853)	(4.714)
N	118	118	118	118	118	118
R^2	0.370	0.372	0.323	0.327	0.308	0.309
adj. R^2	0.311	0.301	0.260	0.250	0.244	0.230

Note. Dependent variable: cumulative abnormal return (CAR, percentage points) over the indicated event window. Columns (1), (3), (5) replicate the baseline extended specification from Table 8. Columns (2), (4), (6) additionally include the continuous sentiment score and the news coverage dummy. Sample: underleveraged acquirers with non-missing target leverage and controls (N = 118). Robust standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

Crucially, the inclusion of the sentiment variables leaves the leverage variable coefficients essentially unchanged and produces no meaningful increase in adjusted R-squared, indicating that sentiment is not correlated with leverage characteristics in a way that would confound the main results. The analysis is repeated restricting the sample to the 98 deals with confirmed news coverage, where sentiment variation is not mechanically constrained to zero; the results remain qualitatively identical.

Table D. 2. Market sentiment analysis for deals with media coverage.

	(1) **CAR [-1,+1]**	**(2)** **CAR [-2,+2]**	**(3)** **CAR [-5,+5]**
Overleveraged Targets	-0.999	-1.040	-1.048
	(2.722)	(2.596)	(2.375)
Target's Leverage Deviation	-0.922	-0.443	1.039
	(5.081)	(5.263)	(5.568)
Sentiment	1.447	-1.728	-0.0366
	(3.222)	(3.530)	(3.328)
Log (Deal Value)	0.750*	0.685	0.693*
	(0.441)	(0.416)	(0.407)
Relative Deal Size (Deal Value/Market Cap)	-1.444**	-1.345***	-1.548***
	(0.571)	(0.465)	(0.413)
Cash Financed Deals	0.502	-0.0964	0.511
	(1.107)	(1.131)	(1.394)
Log (Total Assets)	-0.200	-0.239	-0.0766
	(0.189)	(0.189)	(0.232)
Acquirer's Leverage Deviation	-7.922	-2.277	-1.795
	(6.761)	(6.357)	(7.415)
Profitability of Acquirers (as in Table 3)	-25.65**	-24.05**	-26.22***
	(12.80)	(10.54)	(9.579)
MTB of acquirers (as in Table 3)	0.418	0.345	0.494*
	(0.342)	(0.284)	(0.286)
Cross Border Deals	-4.046***	-3.541***	-4.836***
	(1.243)	(1.225)	(1.598)
Constant	4.290	6.431	1.906
	(5.452)	(5.210)	(5.589)

N	98	98	98
R^2	0.389	0.345	0.339
adj. R^2	0.311	0.261	0.254

Note. CAR in percentage points over the indicated event window. Sample restricted to the 98 deals with at least one retrieved news headline. All specifications include the continuous sentiment score alongside deal and acquirer controls. Robust standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01.

The absence of significant sentiment and news visibility effects indicates that announcement-period returns are not supported by narrative information. This is consistent with evidence that the relationship between investor sentiment and M&A returns is sensitive to measurement and context (Danbolt et al., 2015; Fu et al., 2019) and rules out the possibility that informational frictions account for the null H1 result.

Taken together, the absence of both leverage and sentiment effects at announcement points to a unified interpretation: short-run CARs do not incorporate value-relevant information about target capital structure or about the narrative environment surrounding the deal. This is consistent with the view that announcement-period market reactions reflect primarily uncertainty and deal-completion expectations rather than a comprehensive assessment of restructuring potential (Asquith, 1983; Danbolt et al., 2015). The economic consequences of capital structure misalignment materialise over longer horizons as post-acquisition restructuring unfolds, which is precisely where H2 and H3 find empirical support.

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