"Flexibility or Vulnerability? Real Options Theory and Acquisition Motive Diversity in Distressed Acquiring Firms"

Examining the Performance Implications of Strategic Motive Diversity in High-Tech M&A

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Abstract

Some acquisitions are more risky than others, depending on what acquisition motive is pursued. However, less is known about the impact of multiple acquisition motives on the post-acquisition performance. This study argues that when firms pursue diverse motives, they create different strategic paths that provide future opportunities. Extending on real options theory, this study conceptualized the diversity of acquisition motives as a mechanism for creating a portfolio of options that enhances a firm's strategic flexibility and adaptability in uncertainty. The creation of options are specifically beneficial for firms in distress, due to increased uncertainty and need for strategic flexibility. Through a panel data approach of acquisitions deals involving firms from the high-tech industry in the period of 2008 to 2020, the data is analyzed using time fixed-effects regression. The findings show no significant relationship between motive diversity and post-acquisition performance and no significant moderation effect of firm distress. However, while distressed firms theoretically expected to benefit from motive diversity, the realization of an increased performance could be due to other factors.

Introduction

Acquisitions are perceived as high-stakes strategies, offering opportunities but also coming with considerable risks (Dyer et al., 2004). Acquisitions can drive growth, increase innovations, and enhance competitive advantage, however they are also known to often fail (Dyer et al., 2004). The risks of such acquisition strategies are more obvious for firms in financial distress, these firms often operate under increased uncertainty and managerial deficiencies (Kim et al., 2011). Despite such vulnerabilities, distressed firms continue to pursue acquisitions as turnaround strategies, aiming to diversify risk, enhance or access new capabilities, and restore their financial health (Ogendo & Ariemba, 2022; Zhang, 2022). However, despite some success, the outcomes of such acquisitions remain highly variable (Dyer et al., 2004).

A key factor influencing these varying outcomes are the decisions on acquisition motives (Chen et al., 2024). Some motives carry more risk under uncertainty, meaning that their potential value differs with the firm's context and uncertainty level (Lim & Lee, 2016). Exploratory motives, such as entering unfamiliar markets or acquiring new technologies, creates long-term growth but also exposes firms to greater uncertainty and challenges (Angwin, 2007). Exploitative motives tend to be more predictable and less resource-intensive but offer less potential for gains (Lin, 2014). Nonetheless, to survive, firms need to be flexible and adjust their acquisition motives dynamically (Aalbers et al., 2021b). This is especially true for firms in high-tech industries, these firms simultaneously face intense competition and rapid technological change (Lin, 2014). Making it highly important to improve their efficiency through exploitation, and innovativeness through exploration (Lin, 2014).

However, complexity increases when firms pursue diverse acquisition motives. Additionally, it is still unclear to what extent a diverse set of motives leads to better post-acquisition performance compared to singular motives (Aalbers et al., 2021a; Rabier, 2017). Empirical evidence confirms the complementary relationship between exploration and exploitation (Bauer et al., 2016; Senaratne & Wang, 2018). Nonetheless, implementing multiple strategic objectives across isolated or interrelated acquisitions comes with significant implementation challenges (Van Oorschot et al., 2022). Such challenges are often greater for distressed firms. Distressed firms operate under managerial deficiencies, financial constraints, and increased uncertainty (Grewal & Tansuhaj, 2001; Kim et al., 2011; Trahms et al., 2013). These firms often lack the strategic flexibility needed to adapt and act effectively (Kazozcu, 2011). The decisions on acquisitions are highly strategic and can be influenced by factors like

CEO overconfidence or weak governance, leading to high-risk, debt-fueled acquisitions that can deepen financial distress (Zhang, 2022). Given these constraints, the value of pursuing diverse acquisition motives, while potentially beneficial for flexibility, becomes less straightforward under distress.

Strategic decision-making frameworks are critical in understanding how firms manage uncertainty and decide on what motives to pursue. Real Options Theory (ROT) provides a valuable lens for understanding strategic flexibility and decision-making in acquisitions, particularly in uncertain and high-risk contexts (Kogut & Kulatilaka, 2001; Trigeorgis & Reuer, 2016). ROT posits that firms can structure their acquisitions as a series of several decisions (Brouthers & Dikova, 2009; Trigeorgis & Reuer, 2016). Such decisions can be framed as options, which firms can leverage based on new information (Brouthers & Dikova, 2009; Trigeorgis & Reuer, 2016). Through acquisitions, firms can create real options and build an option portfolio that enhances flexibility in uncertainty and shape future optionality (Anand et al., 2007; Rese & Roemer, 2004; Trigeorgis & Reuer, 2016). In this way, firms can leverage certain created options to increase value and mitigate risks associated with uncertainty (Anand et al., 2007). Ultimately, the strategic value of acquisition motives does not just come from their immediate outcomes but also in the future optionality they create. Therefore motive diversity serves as a strategic intent for building strategic flexibility through the creation of real options. Firms that are diverse in their acquisition motives are flexible and manage uncertainty, the present and the future through exploitation and exploration.

Although ROT has been applied to single investment or entry decisions, its implications for acquisition strategies, particularly those involving acquisition motives, are still underexplored. This is a significant gap, especially for distressed firms. These firms face the highest need for strategic flexibility and the greatest constraints in exercising it (Kazozcu, 2011). Additionally, the lack of clarity is problematic because it leaves open questions about the extent to which distressed firms can effectively pursue acquisitions as a recovery strategy. It is suggested that acquisition motives for low-growth potential firms differ from those of high-growth acquirers, however additional investigation is requested into how options analysis may better inform the understanding of the expected outcomes of acquisition motives and the post-acquisition performance in distressed firms (Davis & Madura, 2017). Understanding whether distressed firms in uncertainty benefit from motive diversity and options when pursuing acquisitions helps managers about when to prioritize flexibility versus commitment.

This study addresses these research gaps by examining in what way diverse acquisition motives, as strategic intents, can generate a portfolio of real options that enhance adaptability and flexibility, particularly in the context of financial distress. Specifically, this research explores the moderating role of firm distress in acquisition motive diversity on post-acquisition performance and aims to assess whether there is a difference between distressed and non-distressed firms in how they benefit from diverse acquisition motives. While distressed firms are likely to gain more from motive diversity due to their greater need for flexibility and adaptability, they often face significant constraints that may hinder their ability to fully realize these benefits. Therefore, this study adopts the following research question: *"What is the effect of the acquiring firm's level of distress on the relationship between motive diversity and post-acquisition performance?"*

The hypotheses and research question will be tested using a quantitative panel research design, analyzing a sample of 1791 acquisition deals among 875 firms between 2008 and 2020 undertaken by both distressed and non-distressed firms. The sample will be particularly focused on the high-tech industry, as this industry is more sensitive to firm crises (Jeyasingh, 2023).

By integrating Real Options Theory with acquisition strategy research, this study explores whether firms can achieve better acquisition outcomes by treating acquisition motives as strategic intents that generate a portfolio of real options. Thereby enabling greater flexibility and future adaptability, especially under conditions of distress. When firms create options for themselves, they create flexibility to adapt to evolving circumstances (Rese & Roemer, 2004; Trigeorgis, 1996). Firms can alter options that may negatively impact their position or explore options with increased benefits, enhancing value creation (Brouthers & Dikova, 2009). Integrating ROT with acquisition motive diversity and firm distress considerations, this study aims to contribute to the literature on turnaround strategies, acquisition literature and strategic decision-making in uncertain environments.

Theoretical framework

Firms pursue acquisitions for different strategic reasons, from entering new markets to enhancing operational efficiency (Angwin, 2017; Japhet, 2021; Rabier, 2017). Prior research categorized these motives and explained how individual motives impact performance, however, less attention has been given into how combining diverse motives across or within acquisitions contributes to a firm's long-term adaptability and performance (Aalbers et al., 2021a; Rabier, 2017). This study uses a Real Options perspective to address this gap. Acquisitions create options for the firm and by building a portfolio of options the benefits of such options increases (Trigeorgis & Reuer, 2016). Having a portfolio of options allows firms to strategically become more flexible and create more value (Brouthers & Dikova, 2009; Čirjevskis, 2021; Trigeorgis & Reuer, 2016). However, real options are often firm-specific, and can be non-existent, so-called shadow or hidden options (Trigeorgis & Reuer, 2016). These shadow or hidden options can arise through new and past investments as these shape future opportunities (Brouthers & Dikova, 2009; Trigeorgis & Reuer, 2016). Through acquisitions, firms can gain knowledge and capabilities over time and can improve their ability to act more flexibly in the future and leverage their options more effectively and create new ones (Brouthers & Dikova, 2009; Trigeorgis & Reuer, 2016).

This study extends this logic of ROT by arguing that the diversity of acquisition motives enhances strategic flexibility through creating a more diverse real option portfolio[1]. Implementing different motives across isolated or multiple acquisition(s), firms can effectively gain diverse knowledge and capabilities (Angwin, 2007). In turn these acquisitions also create new strategic options (Čirjevskis, 2021). Enabling firms to respond to uncertainty, enhance a firm's acquisition performance and create flexibility (Anderson, 2000; Rese & Roemer, 2004). These benefits are critical for distressed firms implementing an acquisition as a turnaround strategy, as flexibility and increased performance are crucial for survival (Khandwalla, 1983; Pearce & Robbins, 2008; Zhang, 2022). Nonetheless, acquiring and creating such a portfolio of options comes with costs, as it introduces integration challenges, due diligence costs, resource allocation trade-offs, and managerial complexity (Brouthers & Dikova, 2009). This study aims to create a better understanding, through the lens of ROT, on how acquisition motive diversity influences post-acquisition performance and how the context of financial distress moderates the value of such strategic flexibility.

[1] Use of OpenAI's ChatGPT in improving writing. Asking for feedback allowed for better writing and flow in the text. Sources are self found and rechecked if needed and rechecked if ChatGPT added new sentences to improve clarity or writing. Prompt:
- *Please provide feedback for writing and flow on the text I submitted here above.*

Real options theory (ROT) is a valuable theoretical lens for this study, as it provides strategic flexibility in decision-making when faced with uncertainty (Kazozcu, 2011; Trigeorgis & Reuer, 2016). ROT is originally a financial options theory for acquiring financial security when making investments and is linked to strategic management by several scholars (Anderson, 2000; Myers, 1977; Trigeorgis & Reuer, 2016). ROT provides a theoretical foundation for understanding strategic flexibility and decision-making, and gives a firm the right, but not the obligation, to move in a certain direction (Suciu & German, 2017; Tamayo-Torres et al., 2009; Trigeorgis & Reuer, 2016). ROT views uncertainty as an opportunity instead of a constraint and argues that uncertainty creates potential profitability and value (Anderson, 2000). Firms can respond dynamically to new knowledge and insights, therefore leveraging upside potential while limiting potential losses (Anderson, 2000). This difference in uncertainty perception leads to different decisions regarding investments (Anderson, 2000). ROT enables a dynamic decision approach, where firms structure their assets to maximize future optionality instead of committing rigidly to one path (Anderson, 2000). Having a diverse set of options, firms can mitigate different uncertainty risks, as value and relevance of certain options are affected differently depending on the type of uncertainty (Anand et al., 2007; Chi et al., 2019; Smit & Trigeorgis, 2006; Trigeorgis and Reuer (2016).

Each option drives the firm in different strategic directions. ROT includes options to defer, grow, scale, switch and abandon, where each option offers different advantages under uncertainty (Suciu & German, 2017; Tamayo-Torres et al., 2009; Trigeorgis & Reuer, 2016). The defer option lets firms delay or phase investments when facing uncertainty, enabling firms to gain more knowledge before fully investing (Tamayo-Torres et al., 2009; Trigeorgis & Reuer, 2016). The growth option involves entering a new or foreign market or gaining new technologies, allowing for potential to deepen involvement at a later moment (Trigeorgis & Reuer, 2016). Committing early can enhance future flexibility and create future growth options (Driouchi & Bennett, 2011; Trigeorgis & Reuer, 2016). The alter scale option allows firms to expand or contract operations. If market conditions turn out to be favourable, firms can expand the scale of production or accelerate the use of resources (Tamayo-Torres et al., 2009). If conditions turn out to be less favourable, firms can reduce or contract the scale to limit financial losses (Tamayo-Torres et al., 2009). The alter scale option allows for more flexibility and generates more profitable outputs (Tamayo-Torres et al., 2009). Switch options provide firms with the flexibility to reallocate resources or shift between strategic paths, such as from competition to cooperation, based on evolving external conditions (Smit & Trigeorgis, 2006; Trigeorgis & Reuer, 2016). This ability to switch between real options

within a portfolio enhances strategic flexibility and allows firms to adapt investments to their best alternative use under uncertainty (Anand et al., 2007; Trigeorgis, 1993). Lastly, the abandon or exit option provides the ability to quit on an investment, as not all investments pay off (Trigeorgis & Reuer, 2016). This allows firms to exit unprofitable markets or sell off underperforming assets or technologies to limit further financial or resource losses (Trigeorgis & Reuer, 2016).

According to ROT, firms can create such flexibility and abilities to adapt to uncertainty, market changes, and new information, allowing firms to treat investments as flexible opportunities rather than fixed commitments (Brouthers & Dikova, 2009). Managers should not treat the acquisition trajectory as a static path but are advised to view it dynamically and adjust their decisions depending on uncertain developments (Čirjevskis, 2021). When acquisitions are viewed through the perspective of options theory, each M&A transaction creates a collection of options (Čirjevskis, 2021). Based on ROT, options can enhance a firm's competitiveness, performance, and deliver sustainable competitive advantages in the future (Čirjevskis, 2021). Firms can leverage the flexibility inherent in ROT to determine which options to pursue depending on their potential impact on firm performance (Brouthers & Dikova, 2009).

ROT and Motive Diversity

Acquisition motives are the underlying strategic reasons that drive firms to pursue acquisitions (Calipha et al., 2010; Rabier, 2017). These motives shape not only the decision to acquire but also the approach to integration and the ultimate success (Angwin, 2017; Chen et al., 2024; Rabier, 2017). Firms can decide to pursue an acquisition to expand their markets, diversify, or create synergies (Angwin, 2017; Japhet, 2021; Rabier, 2017). However, beyond these strategic objectives, acquisitions are often categorized based on whether they focus on improving existing capabilities or seeking new opportunities. This distinction aligns with the theoretical framework of exploration and exploitation (Aalbers et al., 2021a; Lin, 2014; Stettner & Lavie, 2013). Exploratory motives are considered value-maximizing, and focuses on synergy creation, new technologies, new markets, or competencies for long-term innovation and transformation (Aalbers et al., 2021a; Angwin, 2017). Contrary, exploitative motives are considered non-value maximizing, and are more often driven by the need to cut costs, enhance existing capabilities, prevent decline, or preserve competitiveness (Aalbers et al., 2021a; Angwin, 2017). Acquisitions based on a mix of motives are defined as ambidextrous (Aalbers et al., 2021a; Bauer et al., 2016). Ambidexterity simultaneously

pursues exploitative and explorative motives (Aalbers et al., 2021a; Bauer et al., 2016). However, rather than approaching each acquisition as an isolated deal, firms often engage in acquisition sequences (Laamanen & Keil, 2008). In such sequences, firms pursue sequential ambidexterity, and shift between explorative and exploitative motives across acquisitions (Bauer et al., 2016). Confirming the complementary relationship between exploration and exploitation as firms adapt their acquisition strategies over time (Senaratne & Wang, 2018).

These acquisition motives take the firm into different strategic paths. Such acquisitions open up or shape future investments and therefore create new options (Trigeorgis & Reuer, 2016). Distinct acquisitions have different option profiles and create different options for the firm (Smit & Trigeorgis, 2006). Real options are seen as investments that enable future value creation and flexibility without requiring full commitment of resources upfront (Anand et al., 2007). Such acquisitions can be seen as future bets. These acquisitions allow firms to adjust their investments at a later stage by leveraging their options, and when more information is available or uncertainty is less (Tamayo-Torres et al., 2009; Trigeorgis & Reuer, 2016).

Therefore, this study argues that when firms pursue a diversity of motives, they build a broader foundation for future moves. This enhances overall capacity to shift direction in response to uncertainty or take advantage of opportunities. In this way, acquisition motives do not just explain past decisions, they actively shape the future options. Through pursuing diverse motives the firm essentially builds its own portfolio of options, and when carefully managed, enhances strategic decision-making, flexibility, and firm value. In a portfolio of options, the value of options can be influenced by other options in the portfolio, where options can complement or substitute each other (Trigeorgis & Reuer, 2016). Creating a portfolio of options develops new capabilities and market insights, enhances firms' abilities to leverage flexibility and create a competitive advantage (Smit & Trigeorgis, 2006).

However, acquisitions are costly, and building such a portfolio of options introduces several costs (Anderson, 2000). Integrating acquisitions with multiple motives requires complex coordination, resource allocations, and can lead to less focus on the core business (Lin, 2014). Lack of integration or strategic clarity can reduce the potential value of the option portfolio, leading to inefficiencies or missed opportunities. For instance, an option portfolio that is too large to manage, increases complexity and integration costs (Tong & Reuer, 2007). Managers need to identify and act on real options across operations, but increasing complexity can lead to organizational difficulties that hinder optimal option use (Tong & Reuer, 2007). Rising complexity and coordination costs may outweigh the flexibility

benefits (Tong & Reuer, 2007). The logic and flexibility of ROT can therefore be undermined due to those high costs that come with creating flexibility (Driouchi & Bennett, 2011). These costs may lead to firms favouring commitment over flexibility (Driouchi & Bennett, 2011). Commitment to a strategic path gives more control and reduces transaction costs, but also limits flexibility as decisions are harder to reverse (Trigeorgis & Reuer, 2016). Higher performance comes from developing the right options at reasonable costs and exercising these options when business conditions are most favorable (Anderson, 2000). Therefore, while motive diversity strengthens adaptability and flexibility, it also has its limits and creates short-term trade-offs that firms must carefully manage to realize the strategic value of their options.

Firms with motive diversity do not adhere strongly to a single strategic rationale but instead navigate between exploitation, exploration, and ambidextrous motives depending on external conditions, strategic priorities, and uncertainties. Firms with motive diversity create a more diverse option portfolio. In which options can complement each other and firms can better leverage flexibility to adapt to uncertainty, respond to market shifts, and enhance value creation. This flexibility, understood as a portfolio of options created by the firm, is expected to increase the likelihood of positive post-acquisition performance (Brouthers & Dikova, 2009; Čirjevskis, 2021; Trigeorgis & Reuer, 2016). Accordingly, the following hypothesis is proposed:

H1: Motive diversity in acquisitions is positively associated with post-acquisition performance.

ROT and Firm Distress

Firm distress indicates a steady deterioration in a firm's adaptation to its environment, which consequently leads to a reduction in resources (Habib et al., 2018; Kazozcu, 2011). Distress can be triggered by external and internal factors, such as competitive shifts, environmental shocks, operational inefficiencies and poor resource management (Trahms et al., 2013). To reverse such distress, firms implement turnaround strategies aimed at recovering their economic performance (Kazozcu, 2011). Distressed firms often use acquisitions as turnaround strategies as such acquisitions can provide growth and diversify bankruptcy risk (Zhang, 2022). In distressed situations, flexibility is crucial for survival, firm performance, and recovery after a crisis (Grewal & Tansuhaj, 2001; Kazozcu, 2011). Flexibility allows firms to continuously adapt in a competitive business environment, change direction quickly, adapt strategically, and drive firm performance (Nadkarni & Herrmann, 2010).

ROT provides a valuable foundation for understanding how firms manage uncertainty through acquisitions by making use of their strategic flexibility created through real options and better assess opportunities (Brouthers & Dikova, 2009; Čirjevskis, 2021; Tamayo-Torres et al., 2009; Trigeorgis & Reuer, 2016). This approach ultimately enhances performance and competitive advantage through flexible investment and decision-making strategies (Tamayo-Torres et al., 2009). By creating real options, firms are better able to manage complexity and uncertainty when facing risky decisions.

Distressed firms are particularly well-positioned to benefit from exercising real options. Their increased exposure to uncertainty and limited margin for error make strategic flexibility not just beneficial but essential for survival and recovery (Grewal & Tansuhaj, 2001; Kazozcu, 2011; Yousuf et al., 2021). ROT enables firms to increase potential upside value of their assets through strategic flexibility and allows them to rationally decide on investments (Čirjevskis, 2021; Kang et al., 2020). The value of flexibility grows with uncertainty and decision irreversibility (Anderson, 2000; Yousuf et al., 2021). Making real options for distressed firms a valuable source of flexibility.

Simultaneously, the practical applicability of ROT may be limited due to different circumstances such as deficiencies, implementation weaknesses, or different organizational realities (Trigeorgis & Reuer, 2016). Distressed firms have high debt levels and less financial flexibility, limiting their ability to seize opportunities or adapt to changing market conditions (Arbogast & Kumar, 2018). Consequently, these firms are more likely to make rigid, survival-driven decisions that lock them into risky acquisitions (Eisdorfer, 2008; Kim et al., 2011). Path dependence and desperation can also lead to strategic inertia, limiting a firms' ability to adapt and increasing the risk of failure (Heine & Rindfleisch, 2013). Importantly, the exercise of real options is not cost-free as it introduces complexity, demands managerial attention, and can strain already limited resources (Trigeorgis & Reuer, 2016). Implementing a portfolio of options creates complexity and coordination challenges (Tong & Reuer, 2007). As complexity rises, firms are more likely to make organizational errors and less effective option use, potentially decreasing flexibility benefits and performance (Tong & Reuer, 2007). The limitations that define distressed firms may make it difficult to pursue diverse motives and create options effectively. Therefore, distressed firms have to be cautious in their decision-making to avoid rigid and risky decisions that can worsen performance. Nonetheless, while distressed firms face these constraints in the practical exercising of options, theoretically, they stand to gain more from the successful use of motive diversity.

This is contrary to non-distressed firms, as the presence of financial resources and the absence of desperation and deficiencies allows non-distressed firms to adjust their acquisitions and leverage strategic flexibility more easily. Non-distressed firms can leverage their financial flexibility, and adapt financial resources where necessary (Arbogast & Kumar, 2018; Mahmood et al., 2021). Therefore, non-distressed firms can more easily adapt their acquisition strategies in real time and decide on an option as new information becomes available. In relation to ROT, financial flexibility enables firms to strategically leverage and create options and support their investments with optimal decision-making and future opportunities (Arbogast & Kumar, 2018). Thereby allowing these firms to better manage risk and capitalize on strategic opportunities (Mahmood et al., 2021).

However, non-distressed firms face lower levels of macroeconomic and firm-specific uncertainty, making them less vulnerable to uncertainty compared to distressed firms (Byrne et al., 2015). Strategic flexibility is more valuable in uncertain environments, allowing firms in increased uncertainty to adapt decisions and resource allocations in response to rapidly changing conditions (Yousuf et al., 2021). Firms that employ strategic flexibility in increased uncertain contexts tend to see improved performance, since flexibility serves as an effective mechanism for managing this unpredictability (Yousuf et al., 2021). Therefore, this study argues that the value of motive diversity on post-acquisition performance is less for non-distressed firms compared to distressed firms, due to the decreased level of uncertainty and reduced effect of strategic flexibility on performance.

The applicability of motive diversity might be easier for non-distressed, the performance benefits gained are likely to be less than for distressed firms. Acquisitions represent high-stakes and uncertain decisions that can determine distressed firms' survival, and where reducing uncertainty and increasing flexibility is critical in the successful implementation of a turnaround strategy (Khandwalla, 1983; Pearce & Robbins, 2008; Zhang, 2022). In such contexts, having the ability to create and take advantage of multiple strategic options becomes more valuable. Distressed firms acquiring with diverse motives can create diverse real options and adapt their acquisition turnaround strategy when conditions are more favorable or certain. While distressed and non-distressed firms can both benefit from motive diversity, firm distress is expected to strengthen the positive relationship between motive diversity and post-acquisition performance. Therefore, the following hypotheses are proposed:

H2: Firm distress positively moderates the relationship between motive diversity and post-acquisition performance, such that this relationship is stronger for distressed firms

Methodological framework

This study adopted a quantitative panel research approach. This allowed tracking firms over time to analize how diverse acquisition motives impact post-acquisition performance, and how this relation is moderated by firm distress, providing deeper insights into dynamic acquisition outcomes. By the use of longitudinal data and a time fixed-effects regression, this approach helped to control for unobserved heterogeneity across firms and years (Longhi & Nandi, 2014). This study focuses on acquirers in the high-tech industry, which includes industries such as pharmaceuticals, aerospace, and computer systems design, where scientific research and technological innovation are essential to their operations (Wolf & Terrell, 2016). Firms in these industries are often under pressure to sustain growth and adapt to rapidly changing environments, which is largely due to globalization, recession, increased competition, and political fluctuations (Jeyasingh, 2023). This makes the acquisition motives of these firms particularly interesting for understanding post-acquisition outcomes. Since you are only using acquisition years and not all years in the timeframe from 2008 to 2020, you should adjust the sentence to reflect that you're only focusing on the years in which acquisitions occurred. The timeframe of this study focuses on the years in which acquisitions were completed between 2008 and 2020, which allowed for a longitudinal examination. For firms to be included in the sample they must have conducted at least one acquisition during the period, as it will allow for a comparison between a single motive and a diversity of motives.

The data for this study is gathered from multiple secondary sources. The dataset, included acquirer and target information (e.g. SIC codes, announcement dates, and nationalities) and was extended using NexisUni and Revinitiv databases. Through NexisUni, the data was extended with press releases and deal-related announcements, these were necessary to be able to manually code acquisition motives for each transaction. Firm-level financial data, including EBITDA, interest expenses, total assets, and market valuation metrics (Tobin’s Q), were gathered from Refinitiv Datastream. These sources are essential for calculating post-acquisition performance and assessing the level of financial distress. A key constraint in data collection was the availability and consistency of deal-related information on the rationale of the acquisition. Not all acquirers published their deal rationales, and in some cases, the rationale statements were too vague to be reliably coded, even though clear keywords were used to categorize the deals. Additionally, some financial data were unavailable for firms or for the full panel period. To maintain data quality, only deals with sufficient motive clarity and complete financial reporting were included in the final sample.

Variable measurements

Post-acquisition performance

To measure post-acquisition performance, this study adopted Tobin's Q, following the study of Shyu (2011), Tobin's Q is used as a firm performance measurement. Tobin's Q is a forward-looking measure of firm performance, reflecting investor expectations about the future rather than past accounting measures, as these can often be influenced by standardized financial data (Shyu, 2011). Singh et al. (2017) explain that Tobin's Q offers several advantages over accounting-based measures because it avoids the reliance on accounting profits. Tobin's Q is a market-based and future-oriented measure, it reflects the present value of a firm's future cash flow (Singh et al., 2017). Tobin's Q is calculated as follows:

$$Tobin's\ Q_{it} = \frac{Market\ value\ of\ Equity + Book\ value\ of\ Debt}{Book\ value\ of\ Total\ Assets}$$

Where i denotes the firm and t the year. The measure is computed annually for each firm; this consistent, firm-level measure allows for year-by-year tracking of changes in firm value post-acquisition.

Motive diversity

Motive diversity refers to the extent to which a firm pursues a range of acquisition motives, allowing it to treat acquisitions as a portfolio of strategic options. To be able to measure motive diversity, this research first categorized different motives based on the research of Aalbers et al. (2021a) and the Ansoff matrix (Peterdy, 2023). The Ansoff matrix provides four categories, market penetration, product development, market development and diversification (Peterdy, 2023). Based on these categories and keywords the categories can be classified into an exploration-exploitation framework, including ambidexterity. Each acquisition announcement is manually coded based on its rationale into one of three categories: explorative, exploitative, or simultaneous ambidexterity. Simultaneous ambidexterity is referred to announcements where the rationale explicitly refers to both explorative and exploitative goals.

The proportion of motives was measured using the entropy index. This index is widely used in studies to measure diversity and capture a distribution balance among categories, such as for diversification strategies in corporate settings (Jost, 2006; Palepu, 1985). In the context of this study, the index can quantify the distribution of acquisition motives reflecting the firm's pursuit of diverse acquisition strategies. Additionally, this method allows to measure strategic options of a firm by capturing the variety and balance of acquisition motives. However, this research also aims to investigate the diversity within and

across motives, which also aims at exploring sequential ambidexterity. The study does not explicitly measure sequential ambidexterity directly, but it does capture motive variation indirectly through the entropy index. This index reflects how balanced and diverse a firm's acquisition motives are in a given year, but over multiple acquisition years, it also signals if diversity of motives changes.

The entropy index reflects how flexibly a firm is positioning itself to respond to uncertainty, whether through exploration, exploitation, or ambidexterity. A higher entropy score indicates a broader set of strategic options the firm is keeping open, suggesting greater flexibility and adaptability in its acquisition approach. The entropy index was calculated annually to capture year-to-year variation in motives, aligning with panel structure and enabling analysis of how shifts in diversity influence post-acquisition performance over time. The entropy index follows the following formula:

$$H = -\sum_{i=1}^{n} p_i log\, p_i$$

The result is a measure of the distribution's balance: if all motives are equally represented, entropy is higher; if one motive dominates, entropy is lower. The line between high and low diversity is drawn from the mean; above the mean diversity is considered high, and below the mean diversity is considered low (Palepu, 1985).

Firm distress

To measure the moderating variable firm distress, this study used the definition of firm financial distress. Financial distress occurs when a firm struggles to meet its financial obligations due to insufficient earnings, low cash flow, or an inability to repay debts (Yazdanfar & Öhman, 2020). Following the definition and measurement of financial distress of the research of Yazdanfar en Öhman (2020), this study defined financial stress as a situation where a firm's EBITDA is lower than its interest expenses, representing its risk buffer. A negative buffer indicates financial distress, as the EBITDA will be insufficient to cover the interest expenses. In contrast, a positive buffer will indicate non-financial distress, as the EBITDA is sufficient enough to cover the interest expenses.

$$Financial\ distress = EBITDA - interest\ expenses$$

Control Variables

A variety of control variables were incorporated into this research. These variables were based on similar studies that also investigated acquisition motives and outcomes of these acquisitions. Below are several characteristics identified that are known to impact the performance of acquisitions.

Firstly, the acquirer's size was measured as the number of employees (Aalbers et al., 2021a). Along with the acquirer's experience in acquisitions, this was measured following the research of Aalbers et al. (2021a) and Rabier (2017), who measure experience as the number of acquisitions made by the acquirer. For this research, this variable will be measured in the time frame of 5 years before the start of the panel study. Target relatedness was measured as a dummy variable, where the number 1 is assigned to a related target and a 0 to a non-related target. A target is related if it operates in the same (SIC code) industry as the acquirer (Bruton et al., 1994; Lim & Lee, 2016). Additionally, a dummy variable was created that indicated if the target was domestic (=1) or international (=0); this was followed using the research of Aalbers et al. (2021a). Lastly, the firm's age was also used as a control variable.

Data Analysis

Model justification

To examine the relationship between acquisition motive diversity, post-acquisition performance, and the moderation by firm distress, this study employs a time fixed-effects (FE) panel regression. The choice of the FE model is confirmed by the Hausman test (chi^2 = 24.06, p = .0005), which indicated that the FE regression model is more appropriate than the random effects (RE) alternative. This suggests that unobserved firm-specific effects are correlated with the explanatory variables (Park, 2011). The FE model effectively controls for time-invariant heterogeneity across firms, and therefore isolates the impact of time-varying predictors on the dependent variable (Brüderl & Ludwig, 2015). Prior to conducting the FE regression, several data preparation steps were conducted to ensure the quality of the panel dataset. These steps included the treatment of missing data, identification and handling of outliers, checking assumptions, and mean centering of key independent variables and scaling.

Handling missing data and outliers

Missing data was handled based on its nature and expected occurrence. The entropy for motive diversity showed 85.2% missing values. However, this is to be expected and intentional, as the entropy scores were only computed for years in which the acquiring firm

engaged in at least one acquisition. Missing values were not imputed, as imputing zero's in missing values disregards the meaning of a zero as an entropy index. Therefore, only acquisition-year observations were retained for the analysis. Post-acquisition performance, measured through Tobin's Q, showed 23.6% missingness and were removed using case-wise deletion to preserve the integrity of the regression results. Firm distress had 24% missingness, and was treated similarly through case-wise deletion. Removing these cases ensured focus on relevant post-acquisition observations. Additionally, case-wise deletion was also implemented for missing control values. As a result, only firm-year observations with full information on all variables were retained for analysis. Secondly, the panel set was checked for extreme outliers and influential cases. Through diagnostics as Cook's Distance, standardized and studentized deleted residuals and leverage points (Arimie et al., 2020; Hair et al., 2019). For Cook's Distance, values greater than 1 are considered influential, and standardized and studentized residuals with values greater than three were also flagged (Arimie et al., 2020' Hair et al., 2019). Based on these criteria, a total of four observations were identified as outliers or influential, and were removed from the dataset. Next, the values of Tobin's Q were analyzed through descriptive statistics, as some unlikely high and low values were found in the dataset. Following Woeppel (2022), Tobin's Q is winsorized at the 1% and 99% levels, which mitigates the influence of outliers. These prior steps left a total of 875 firms with $N = 1791$ observations for the time fixed-effects analysis.

Assumption testing and interaction term

To further justify the FE model, the data was checked for any violations of the core assumptions (Park, 2011). Linearity is checked through a visual inspection of a scatterplot of the residuals (Hair et al., 2019). This plot supported a linear relationship between the residuals, which confirmed no violation of the linearity assumption. Multicollinearity is checked through variance inflation factors (VIF). A VIF value of < 5 is considered sufficient (Hair et al., 2019). All the VIF values confirmed no violation of the multicollinearity assumption. To test for potential endogeneity of the independent variables, Durbin-Wu-Hausman tests were conducted (Kock, 2022; Park, 2011). The H0 is that the variables are exogenous, the results were non-significant in both cases (motive diversity chi^2 = 0.0663, p = 0.0687) and (firm distress chi^2= 0.005056, p = 0.9433), indicating that these variables can be treated as exogenous. The endogeneity of firm distress was tested using the panel set including non-acquisition years (N = 9068), as this allowed to create a lagged variable that can be used to test for potential endogeneity. Next, autocorrelation is checked

through the Wooldridge tests (Born & Breitung, 2014; Saptura et al., 2023). The output for the Wooldridge test (F(1, 82) = 17.049, *p*-value = 0.0001) indicates autocorrelation, which is a violation of one of the core assumptions. Lastly, the data was checked for homoscedasticity (Park, 2011). Through the modified Wald test, the assumption of homoscedasticity is tested (Abdullah et al., 2022). The results indicated a chi-square value of (chi^2(875) = 2908367.42, *p*-value = < 0.000), leading to a rejection of the null hypothesis of homoscedasticity. This suggests that the model suffers from significant heteroskedasticity. Additionally, while key variables deviate from normality, this does not invalidate the F-test for fixed effects. The F-test in fixed effects remains robust against non-normality in panel datasets (Baltagi, 2008). Therefore, the model specification and inference remain valid without requiring variable transformation.

Nonetheless, the homoscedasticity and autocorrelation violations can bias standard errors and lead to incorrect inference if not properly addressed (Arellano, 1987). To correct for these violations and ensure valid statistical inference, cluster-robust standard errors at firm level were applied. This approach is recommended for panel data settings and ensures that the hypothesis tests and intervals remain valid despite the presence of these violations (Arellano, 1987).

Lastly, the variable firm distress is scaled into millions of euros, and firm size was scaled to a 1000-employee ratio. This approach prevents extremely small coefficients that are hard to interpret. Motive diversity and firm distress were mean-centered before computing the interaction effect. This minimizes multicollinearity, and allows the interpretation of main effects at the average level of the interacting variable, in line with recommended practices in moderation analysis (Hair et al., 2019).

Research Ethics

Since this thesis was quantitative, making use of data from Refinitiv's SDC Platinum database and NexisUni, issues revolving around confidentiality and privacy are not of concern. To circumvent any form of deception derived from the handling of data, it was only transformed with caution and reference when necessary. No data will be altered to adhere to expectations or any theoretical outcome, or deleted without demonstrably sound grounds.

Results

This chapter presents the findings of the study. An overview is provided of the key variables and patterns, and relationships are highlighted. These findings form the basis for evaluating the impact of motive diversity and the interaction of firm distress on post-acquisition performance.

Shown in Table 1, the descriptive statistics for all variables used in the analysis. Post-acquisition performance has a mean of 2.213 (SD = 1.558), with values ranging from 0.53 to 11.89. The distribution is positively right-skewed and has a high peak, which indicates that most firms lie around the lower end of Tobin's Q, however some firms have much higher values. Motive diversity has a mean of 0.260 (SD = 0.176), with a range from 0 to 1.04. These values indicate that firms, on average, show a low to moderate level of motive diversity. FirmDistress shows some wider variation, the mean is 1.872 million USD (SD = 5.820), along with extreme minimum (-5.874 million USD) and maximum values (83.806 million USD). Indicating that some firms show extreme financial distress or extreme high financial performance. The skewness and kurtosis values suggest a right-sided skew, with some firms at the far end of the tail. Nonetheless, extreme high and low valued firms were not flagged in the approach of identifying outliers, therefore were retained for the analysis.

The control variable prior experience (Experience2002-2007_dummy) captures prior acquisition experience has a mean of 0.53. Indicating that 53% of the firms had acquisition experience in the pre-sample period. CountryRelatedness has a mean of 0.62 and IndustryRelatedness has a mean of 0.39. This suggests that a majority of the sample involves targets from the same country, but less frequently from the same industry. The size variable, measured by the number of employees, shows large variation (SD = 554660), and a mean of 22.592 employees. Finally, FirmAge has a mean of 29.51 years (SD = 26.973) and ranges from 0 to 192 years. All continuous variables except motive diversity exhibit notable skewness and kurtosis, however, normality is not required as the F-test is robust against non-normality (Baltagi, 2008).

Table 1

Descriptive statistics

	N	Min	Max	Mean	SD	Skewness		Kurtosis	
						Statistic	SD	Statistic	SD
TobinsQ_ wins	1791	.530	11.890	2.213	1.558	2.769	.058	10.191	.116
entropy_ motives	1791	.00	1.039	.260	.176	.028	.058	.234	.116
FirmDistress	1791	−5.847	83.806	1.872	5.820	6.423	.058	60.692	.116
Experience_ dummy	1791	0	1	.53	.499	−.127	.058	−1.986	.116
Country Relatedness	1791	0	1	.62	.485	−.504	.058	−1.748	.116
Industry Relatedness	1791	0	1	.39	.488	.455	.058	−1.795	.116
Size	1791	0	434246	22592	54660. 433	4.330	.058	22.280	.116
FirmAge	1791	0	192	29.51	26.937	1.975	.058	4.586	.116
Valid (*N*) listwise	1791								

Table 2 presents the Pearson correlation matrix and provides some relevant insights into the strength and direction of the linear relationships (Hair et al., 2019). Post-acquisition performance, is negatively and significantly correlated with prior experience (r = −0.177, p = < 0.01), size (r = −0.104, p = < 0.01) and firm age (r = −0.123, p = < 0.01). These correlations suggest that larger, older and prior experienced firms tend to have lower performance. Motive diversity is negatively and significantly correlated with post-acquisition performance (r = −0.075, p = < 0.01), suggesting that firms with higher motive diversity have lower post-acquisition performance. However this correlation is extremely small. FirmDistress shows no significant relationship with post-acquisition performance, indicating that distress alone does not predict changes in performance. However, FirmDistress does correlate positively with motive diversity (r =.066, p = < 0.01). Suggesting that, as the financial buffer

of a firm increases, firms are slightly more likely to pursue a mix of explorative, exploitative and ambidextrous motives. Firm distress is also significantly correlated with size (r = 0.606, p = < 0.01), firm age (r = 0.232, p = < 0.01), and prior experience (r = 0.217, p < 0.01). Meaning that distressed firms are more often larger, older and have prior acquisition experience. The prior experience dummy is positively and significantly correlated to motive diversity (r = 0.251, p = < 0.01), size (r = 0.262, p = < 0.01), and firm age (r = 0.303, p = < 0.01), suggesting that firms with prior experience also tend to be older, larger, and potentially more diverse in their motives. Overall, the correlation analysis shows some significant but modest relationships among the variables. These findings provide preliminary insights into the dynamics between firm characteristics, distress, acquisition motives, and performance.

Table 2

Correlation matrix

Variable	*N*	Tobins Q_wins	entropy_motives	Firm Distress	Experience_dummy	Country Relatedness	Industry Relatedness	Size	Firm Age
TobinsQ_wins	1791	—							
entropy_motives	1791	−.075**	—						
Firm Distress	1791	.002	.066**	—					
Experience_dummy	1791	−.177**	.251**	.217**	—				
Country Relatedness	1791	.061**	.004	−.043	−.046*	—			
Industry Relatedness	1791	.001	.080**	−.044	.026	.011	—		
Size	1791	−.104**	.105**	.606**	.262**	−.087**	−.125**	—	

FirmAge	1791	−.123**	.089**	.232**	.303**	−.064**	−.064**	.347**	—

** Correlation is significant at the 0.01 level (2-tailed)

* Correlation is significant at the 0.05 level (2-tailed)

Table 3 presents the results of the time fixed-effects model[2]. Clustered robust standard errors at the firm level were applied to correct for heteroscedasticity and autocorrelation (Arellano, 1987). Motive diversity, shows a positive coefficient on post-acquisition performance, however is not statistically significant (β = .3826915, p = 0.394), offering no support for Hypothesis 1. These statistics indicate that after the model controls for firm-specific heterogeneity and covariates, no clear evidence is found to support that motive diversity within firms is associated with higher post-acquisition performance. The time fixed-effects ensures that the relationship is not influenced by external changes over time, suggesting that the insignificance is not due to year-to-year variation in the environment. Hypothesis 1 initially proposed that motive diversity would be positively associated with post-acquisition performance. Although the coefficient indicates a positive relationship, the result is insignificant. Higher motive diversity within firms over time does not significantly lead to improved performance. This result can be due to the fact that the theoretical benefits of diverse motives and the created flexibility through ROT do not show in short-term outcomes, or due to increased complexity in implementation. The insignificant finding does explain prior research suggesting that the value of real options depends on the firm's ability to implement them.

In contrast, the variable FirmDistress has a positive and significant effect on Tobin's Q (β = .0212388, p = 0.001). The distress variable indicates that a 1 million USD increase in (EBITDA - interest expenses), thus less distress relative to the firm's mean, is positively associated with a small 0.0212 increase in Tobin's Q. Even though the coefficient is small, healthier firms show better post-acquisition performance. The interaction term shows a negative and non-significant relationship on performance (β = −.0256679, p = 0.453), providing no support for Hypothesis 2. This suggests that within firms over time, firm distress does not strengthen the positive effect of motive diversity on performance compared

[2] Use of OpenAI's ChatGPT for the interpretation of the time fixed-effects model.
Prompts:
- How to interpret the independent variables and the interaction effect in the fixed effects regression in relation to post-acquisition performance (Tobin's Q)?. - Can the R squared values of the time fixed-effects model be interpreted similarly as regression models? - Please explain the meaning of the sigma and rho values in the model. - How to interpret the year dummies in time fixed-effects regression?
Using Park (2011) the correctness and reliability of the output was checked.

to non-distressed firms. The time fixed-effects accounts for external changes across the years, the insignificance of the moderation effect is therefore not due to external time-based changes. Firm distress was expected to strengthen the positive effect of motive diversity on performance, since distressed firms would benefit more from flexibility. However the negative coefficient indicates that this relationship appears weaker in such contexts, but this is not significantly supported. Even though the moderation is insignificant the negative coefficient does signal the practical applicability of real options again. Especially for distressed firms, this implementation is often more difficult due to deficiencies and constraints within the firm.

Firm age ($\beta = .3894804$, $p = 0.000$) and size ($\beta = -.00287$, $p = 0.005$) are the only controls that show statistical significance. Older firms tend to perform better after acquisitions and firm size is negatively associated with performance. However, firm size shows an extremely small value; a 1,000-employee increase is associated with a -0.00287 decrease in Tobin's Q, suggesting a statistically significant but small negative effect. Both country-relatedness and industry-relatedness show no significant relation to post-acquisition performance, suggesting that a domestic or related target do not affect the post-acquisition performance differently compared to an international and unrelated target. Prior acquisition experience is omitted from the analysis, due to the fact that the variable is time invariant and does not change over time within a firm. Therefore the fixed-effects model automatically drops the variable as its estimates rely only on time-variant variables (Park, 2011). The year dummies of the time FE (Appendix A table A1) represent the baseline performance shifts in performance across years. From 2010 onward, the coefficients are negative and statistically significant. Indicating that post-acquisition performance declined over time within firms relative to the 2008 reference year. Overall, none of the hypotheses are supported by the model, indicating that motive diversity and the moderation of firm distress do not significantly increase post-acquisition performance.

The model also presents the overall model fit and diagnostics. The fixed-effects model demonstrates small explanatory power. The within R-squared (0.0560) and between R-squared (0.0276) indicate that the model explains approximately 5.60% of the variation in post-acquisition performance within firms over time and 2.76% of the variation in post-acquisition performance between firms over time. The overall R-squared is 0.0207, which means that when both within- and between-firm variation are considered, the model accounts for 2.07% of the total variance on post-acquisition performance. The F-statistic ($F(19,874) = 6.39$, $p = 0.000$) shows overall significance of the model (Park, 2011). This

significance indicates that the variables in the model jointly explain variation in Tobin's Q, despite the small explained variance. Lastly, the sigma value (sigma_u = 9.599) shows the standard deviation of the firm-level error, and shows a larger value than the error term (sigma_e = .87947907). This suggests that most of the residual variance lies between firms. The total variance of 99.17% (rho = 0.99167648) is attributable to firm-specific effects. This again justifies the use of a fixed-effects regression model for this panel study.

Table 3

Fixed effects regression model

Fixed effects (within) regression				Number of obs = 1791		
Group variable: ISIN_num				Number of groups = 875		
R-squared:				Obs per group		
	Within = 0.0560			Min = 1		
	Between = 0.0276			Avg = 2.0		
	Overall = 0.0207			Max = 13		
				F(19 ,874) = 6.39		
corr(u_i, Xb) = −0.9914				Prob > F = 0.000		
		(Std. error. adjusted for 875 clusters in ISIN_num				
TobinsQ_wins	Coef.	Robust std. error.	t	P > t	95% conf. interval	
entropy_ motives_cd	.3826915	.4489299	0.85	0.394	−.498415	1.263798
FirmDistress_cd	.0212388	.006226	3.41	0.001	.0090191	.0334585
Interaction	−.0256679	.0342016	−0.75	0.453	−.0927948	.041459
Experience_ dummy	0 (omitted)					
Country Relatedness	.1430977	.0810534	1.77	0.078	−.0159843	.3021796

Industry Relatedness	−.058705	.0805159	−0.73	0.466	−.2167321	.0993221
Size	−.00287	0.00101	−2.83	0.005	−0.00486	–0.000876
FirmAge	.3894804	.0538974	7.23	0.000	.283697	.4952638
Time fixed effects	yes					
_cons	−7.544125	1.321674	−5.71	0.000	−10.13815	−4.950099
sigma_u	9.599					
sigma _e	.87947907					
rho	.99167648		(fraction of variance due to u_i)			

Overall, the FE model reveals that motive diversity does not significantly affect post-acquisition performance. The fact that firm distress is associated with an increase in performance, suggests that financial health is an important aspect for realizing value from acquisitions, but does not imply that acquisitions reduce distress. The interaction effect is insignificant, concluding that the performance benefits of motive diversity do not differ between distressed or non distressed firms and is not strengthened for distressed firms. The insignificant effects of the hypotheses may indicate that while the theory highlights the value of flexibility through motives and real options, this does not always translate into realized performance under distress. Instead, financial health appears to be a driver of acquisition success. These findings suggest that other factors play a role in determining the potential benefits of motive diversity and the moderation of firm distress. The model highlights some relevance of firm-specific characteristics, particularly distress status and structural factors like size and age, however, these impacts are small in shaping acquisition outcomes.

Robustness checks

To ensure reliability and model independence of the time fixed-effects results, robustness checks were conducted. A random effects model was estimated to compare the consistency of coefficients and significance levels. Second, the distress variable was transformed into a dummy variable (1 = distressed, 0 = not distressed) to test whether the main findings hold under an alternative specification of financial distress. Different combinations of controls

were separately added to the time FE model to inspect how coefficients and significance levels change in the main independent variable and moderation effect. Lastly, a time fixed-effects was performed using the sample including non-acquisition years.

The time random-effects (RE) model, in Appendix B table B1, confirms no inconsistencies between the results of the FE and RE model of the main hypotheses results. Motive diversity (β = .0056749, p = 0.982) shows an insignificant coefficient on post-acquisition performance. Both models do not support H1, confirming motive diversity does not affect post-acquisition performance and is not model dependent. Firm distress (β = .0235834, p = 0.000) shows significance in the RE model, confirming the initial results that better financial health increases post-acquisition performance. Hypothesis 2 is also not supported in the RE model. The interaction variable (β = .0043214, p = 0.880) is insignificant, confirming the FE results of no clear evidence of the impact of motive diversity moderated by distress on post-acquisition performance. However, the interaction in the RE model shows a positive coefficient compared to the negative coefficient in the FE model. This difference is due to the fact that the fixed-effects model looks only at changes within the same firm over time, and the random-effects model includes both differences within firms and between different firms (Park, 2011). However, RE relies on a strong assumption that unobserved firm-specific characteristics are uncorrelated with the explanatory variables (Park, 2011). The fixed-effects control for firm traits and reduces the risk of omitted variable biases. Even though most differences in performance are between firms seen in Table 3 (rho = 0.99), the fixed-effects model is more reliable as it controls for firm-specific traits that might otherwise distort the results (Park, 2011). Both models show insignificant results, which reinforces the robustness of the finding in the fixed-effects model.

In the random-effects model prior experience is not omitted, (β = − .4415262, p = 0.000) and shows a significant but negative relationship on post-acquisition performance. Specifically, firms with prior acquisition experience have a 0.442 lower post-acquisition performance compared to firms without prior experience. While this cannot be confirmed in the FE model, it does signal a possible broader trend across firms. Firm age was positively and significantly related to post-acquisition performance in the FE model. However, the RE model showed a negative relationship, reflecting that, across firms, older firms tend to perform lower. This difference highlights again how the two models capture different types of variation. Country relatedness is significant in the random-effects model (β = .1820358, p = 0.006) but not in the fixed-effects model. The effect is more driven by differences between firms instead of within. This implies that country relatedness does not have a consistent effect

on performance within firms across different acquisitions. Lastly, firm size was consistently negative and significant in both models, suggesting that larger firms tend to experience lower post-acquisition performance.

The second robustness check is performed by creating a dummy variable of firm distress. Dividing firm distress into a dummy allows to split the sample into distressed and non-distressed firms and for easier comparison between the groups. Appendix B Table B2 shows the time FE model with the firm distress dummy variable and the new interaction term. The distress dummy shows a significantly negative main effect on post-acquisition performance, confirming that distressed firms have a lower post-acquisition performance compared to non-distressed firms. Additionally, the interaction is non-significant, and indicates no clear evidence that firm distress moderates motive diversity on post-acquisition performance. This robustness check confirms the findings from the main FE model.

The third robustness check confirms if the coefficients are not driven by specific control variable choices. Therefore, three alternative models were tested. Firstly, a model with only the main variables was specified (Table B3), these results confirmed the results from the main FE model. Secondly a model with continuous controls was added to the model (Table B4), again the results confirmed the results from the main FE model. Lastly, a model was specified with only the dummy controls added (Table B5), once again the main FE results were confirmed. Across all alternative specifications, the coefficient for motive diversity remained positive and non-significant. Similarly, the interaction remained negative and statistically non-significant, supporting the robustness of the findings.

Lastly, a time FE model with imputed zero's for missing values was performed. This sample included N = 9068 and 1013 firms. This model does disregard the meaning of a zero in entropy index but does include more longitudinal firm distress and post-acquisition years. However, seen in Appendix B Table B6 most year dummies show no significance and within R Squared is lower than of the main time fixed-effects model. Additionally, the significance levels are higher and less controls are significant. This confirms the choice for using only acquisition years in the main time fixed-effects analysis.

All robustness checks confirm the main findings from the FE and this result holds across models and different operationalizations of firm distress. The interaction term remains non-significant, suggesting that firm distress does not strengthen the effect of motive diversity on performance compared to non-distressed firms. These consistent findings strengthen the validity of the results and indicate that the conclusions are not driven by model choice.

Discussion

The goal of this study is to examine whether motive diversity positively influences post-acquisition performance and whether this relationship is moderated by firm distress. This study views the use of acquisition motives through the lens of real options theory and interprets motives as a strategic intent to build a diverse option portfolio. The core research question for this study was: *"What is the effect of the acquiring firm's level of distress on the relationship between motive diversity and post-acquisition performance?"*

The theoretical contributions of this study builds upon real options theory, specifically in the context of acquisitions. Most previous research has applied ROT to acquisition decisions, however, this study has extended this scope by arguing in what way diverse acquisition motives can increase a firms' flexibility and positively influence post-acquisition performance. A key theoretical contribution lies in reframing acquisition motives. Instead of treating motives as strategic paths or deal rationales, this study views motives and the diversity of motives as strategic intents that can create real options for the firm. This allows firms to adapt more flexibly to uncertainty and create future optionality. Secondly, this study contributes to the turnaround and firm distress literature and argues that distressed firms, despite resource constraints and deficiencies, have theoretically seen the most to gain from having strategic flexibility through the use of motive diversity and its created options. In doing so, a key tension is highlighted that distressed firms simultaneously face the highest theoretical need for real options and the greatest practical limitations in executing them. This insight provides more understanding in ROT, its applicability, and value in high uncertain situations. This perspective enhances literature on strategic decision-making, ROT and acquisition strategies by showing how motives can help a firms' flexibility and adaptivity.

The managerial implications of this study are specifically valuable for managers in high-tech industries. Three recommendations are made from the insights of the study. First, the key insight for managers is that, particularly the diversity of such motives, should be viewed as a long-term investment in flexibility and optionality. Managers should be open to the idea that motives do not only have to be a way to justify strategic rationales or create immediate benefits, but can create different strategic paths for future growth and flexibility in uncertainty. However, the low within Rsquared and statistical results of this study do not significantly confirm the performance impact or the moderation effect of firm distress. Which suggests that while acquisition motives create theoretical optionality and flexibility, the actual realization of such options may depend on other factors that ROT does not fully address. Additionally, pursuing diverse motives without capacity and abilities to manage increased

complexity may lead to decreased benefits. Especially for distressed firms, there is an increased need for managerial attention to reduce inertia or decisions driven out of desperation. Managers in distressed high-tech firms should consider the complexity and cost of building diverse acquisition portfolios, which may outweigh theoretical flexibility gains. The focus should not be on implementing as many diverse motives but creating diverse and feasible future options for the firm and improving execution of such options. Finally, firms should track and evaluate how motive portfolios evolve post-acquisition to help decide on future acquisition strategies.

This study provides valuable insights in acquisition, ROT, and distress literature, several limitations should also be acknowledged. Motive diversity was operationalized using the entropy index, the index is often used for measuring diversity, however the coding of the acquisition motives was done manually. This subjective way of coding motives may lead to increased inconsistencies, which potentially affects the precision and reliability of the measurement. This is due to the fact that deal rationales often varied in clarity. Secondly, the moderating variable firm distress was measured using an accounting-based method. This measurement effectively measures a firms' risk buffer and indicates financial distress, but it does not take into account other dimensions such as market-based indicators. By incorporating a multi-dimensional measuring approach of firm distress could have allowed for a more nuanced understanding of firm distress. Third, the R-squared within (0.0560) and R-squared between (0.0276), the model explained only a very small proportion of the variance in post-acquisition performance. This is an indication of other unobserved factors that could play a more decisive role in determining performance. This study focused its sample solely on the high-tech industries, specifically STEM occupations. While the theoretical relevance of the high-tech industries is valuable due to its high uncertainty environments, it limits generalizability to other sectors. A final limitation is that the entropy index was only computed for years in which acquisitions occurred, leading to an unbalanced panel set where firms do not have the same number of observations across the period. Additionally, reducing the years to only acquisition years might reduce the representativeness of performance outcomes, as a firm's overall performance during non-acquisition years is not being measured. However, imputing zero's in non-acquisition years disregards important information when no motive diversity is detected.

Concluding is that while the study offers theoretical contributions, future research should aim to address the above-mentioned limitations to better capture the complexity of acquisition strategies, firm distress and their outcomes. Using an alternative measurement to

capture motive diversity allows for missing values to be imputed could provide a more longitudinal examination on the effect of post-acquisition performance. An understanding of other factors and literature beyond ROT is an interesting topic to further explore on how motive diversity and created options could impact post-acquisition performance.

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Appendix A

Time FE model including year dummies

Table A1

Fixed effects regression model

Fixed effects (within) regression	Number of obs = 1791
Group variable: ISIN_num	Number of groups = 875
R-squared:	Obs per group
Within = 0.0560	Min = 1
Between = 0.0276	Avg = 2.0
Overall = 0.0207	Max = 13
	F(19 ,874) = 6.39
corr(u_i, Xb) = −0.9914	Prob > F = 0.000

(Std. error. adjusted for 875 clusters in ISIN_num

TobinsQ_wins	Coef.	Robust std. error.	t	P > t	95% conf.	interval
entropy_ motives_cd	.3826915	.4489299	0.85	0.394	−.498415	1.263798
FirmDistress_cd	.0212388	.006226	3.41	0.001	.0090191	.0334585
Interaction	−.0256679	.0342016	−0.75	0.453	−.0927948	.041459
Experience_ dummy	0 (omitted)					
Country Relatedness	.1430977	.0810534	1.77	0.078	−.0159843	.3021796
Industry Relatedness	−.058705	.0805159	−0.73	0.466	−.2167321	.0993221
Size	−.00287	0.00101	−2.83	0.005	−0.00486	–0.000876

FirmAge	.3894804	.0538974	7.23	0.000	.283697	.4952638
Time fixed effects	yes					
year						
2009	−0.196057	0.1512282	−1.30	0.195	−0.4928697	0.1007558
2010	−0.4948272	0.1667425	−2.97	0.003	−0.8220896	−0.1675647
2011	−0.9070748	0.2326668	−3.90	0.000	−1.363726	−0.4504239
2012	−1.541489	0.2830513	−5.45	0.000	−2.097029	−0.9859498
2013	−1.515023	0.2965769	−5.11	0.000	−2.097109	−0.9329368
2014	−1.764143	0.3404986	−5.18	0.000	−2.432434	−1.095852
2015	−2.281226	0.4050245	−5.63	0.000	−3.076161	−1.486292
2016	−2.798585	0.448316	−6.24	0.000	−3.678487	−1.918683
2017	−2.997556	0.5191331	−5.77	0.000	−4.016449	−1.978663
2018	−3.620154	0.5460829	−6.63	0.000	−4.691941	−2.548367
2019	−3.741169	0.5823572	−6.42	0.000	−4.884151	−2.598187
2020	−4.001551	0.5736168	−6.98	0.000	−5.127379	−2.875724
_cons	−7.544125	1.321674	−5.71	0.000	−10.13815	−4.950099
sigma_u	9.599					
sigma _e	.87947907					
rho	.99167648		(fraction of variance due to u_i)			

Appendix B

Robustness checks

Table B1

Random effects regression model

Random-effects GLS regression	Number of obs = 1791
Group variable: ISIN_num	Number of groups = 875
R-squared:	Obs per group
Within = 0.0466	Min = 1
Between = 0.1106	Avg = 2.0
Overall = 0.0901	Max = 13
	Wald chi^2 (20) = 183.82
corr(u_i, X) = 0 (assumed)	Prob > F = 0.000

(Std. error. adjusted for 875 clusters in ISIN_num

TobinsQ_wins	Coef.	Robust std. error.	z	P > z	95% conf.	interval
entropy_ motives_cd	.0056749	.2586378	0.02	0.982	−.5012459	0.5125957
FirmDistress_cd	.0235834	.0067188	3.51	0.000	.0104148	.036752
Interaction	.0043214	.0286129	0.15	0.880	−.051759	.0604017
Experience_ dummy	−.4415262	.1040916	−4.24	0.000	−.6455419	−.2375105
Country Relatedness	.1820358	.0667375	2.73	0.006	.0512326	.312839
Industry Relatedness	−.0522243	.0666436	−0.78	0.433	−.1828434	.0783948
Size	–0.00317	0.000773	−4.10	0.000	–0.00469	–0.00166

FirmAge	–.0065577	.0015456	−4.24	0.000	–.009587	–.0035284
Time fixed effects	yes					
year						
2009	0.2318799	0.1230602	1.88	0.060	-0.0093138	0.4730735
2010	0.3633011	0.1160104	3.13	0.002	0.1359249	0.5906773
2011	0.3037341	0.1433704	2.12	0.034	0.0227332	0.584735
2012	0.1335211	0.124928	1.07	0.285	-0.1113333	0.3783755
2013	0.6206197	0.1350483	4.60	0.000	0.355593	0.8853095
2014	0.695467	0.1336882	5.20	0.000	0.433443	0.957491
2015	0.7447081	0.1536514	4.85	0.000	0.4435569	1.045859
2016	0.4914023	0.1352253	3.63	0.000	0.2263656	0.7564391
2017	0.7290807	0.1649374	4.42	0.000	0.4058093	1.052352
2018	0.4253711	0.1589581	2.68	0.007	0.1138189	0.7369234
2019	0.7104421	0.1493346	4.76	0.000	0.4177517	1.003132
2020	0.8797486	0.2126764	4.14	0.000	0.4629106	1.296587
_cons	2.119894	.1396759	15.18	0.000	1.846134	2.393654
sigma_u	1.4239657					
sigma _e	.87947907					
rho	.72387048		(fraction of variance due to u_i)			

Table B2

Fixed effects with distress dummy

Fixed effects (within) regression	Number of obs = 1791
Group variable: ISIN_num	Number of groups = 875
R-squared:	Obs per group
Within = 0.0652	Min = 1
Between = 0.0280	Avg = 2.0
Overall = 0.0211	Max = 13
	F (19, 847) = 6.25
corr(u_i, X) = −0.9911	Prob > F = 0.000

(Std. error. adjusted for 875 clusters in ISIN_num

TobinsQ_wins	Coef.	Robust std. error.	z	P > z	95% conf.	interval
entropy_ motives_cd	.3249168	.426064	0.76	0.446	−.5113113	1.161145
Distress_dummy	−.3577031	.1710752	−2.09	0.037	−.6934694	−.0219369
Interaction_ dummy	−.6405159	.7866562	−0.81	0.416	−2.184472	.9034401
Experience_ dummy	0 (omitted)					
Country Relatedness	.1478937	.0822503	1.80	0.073	−.0135374	.3093249
Industry Relatedness	−.0695649	.0807974	−0.86	0.389	−.2281446	.0890148
Size	–0.00147	0.00128	−1.15	0.249	–0.00398	0.00103
FirmAge	.3815842	.0505606	7.55	0.000	.2823498	.4808187

Time fixed effects	yes					
year						
2009	−.1531627	.1498495	−1.02	0.307	−.4472697	.1409443
2010	−.4943943	.1633812	−3.03	0.003	−.8150596	−.173729
2011	−.890051	.2275936	−3.91	0.000	−1.336745	−.4433572
2012	−1.511794	.2713049	−5.57	0.000	−2.044279	−.9793084
2013	−1.465392	.2804568	−5.23	0.000	−2.01584	−.9149449
2014	−1.73107	.3244028	−5.34	0.000	−2.36777	−1.094371
2015	−2.246699	.38212	−5.88	0.000	−2.996679	−1.496719
2016	−2.753278	.4235063	−6.50	0.000	−3.584486	−1.922069
2017	−2.944873	.4929057	−5.97	0.000	−3.19229	−1.977456
2018	−3.529383	.5102477	−6.92	0.000	−4.530837	−2.527929
2019	−3.643962	.5454281	−6.68	0.000	−4.714465	−2.57346
2020	−3.938117	.5349704	−7.36	0.000	−4.988094	−2.88814
_cons	−7.295697	1.232605	−5.92	0.000	−9.714909	−4.876485
sigma_u	9.450179					
sigma _e	.87519645					
rho	.99149602		(fraction of variance due to u_i)			

Table B3
Simplified specification model

Fixed effects (within) regression				Number of obs = 1791		
Group variable: ISIN_num				Number of groups = 875		
R-squared:				Obs per group		
Within = 0.0456				Min = 1		
Between = 0.0330				Avg = 2.0		
Overall = 0.0272				Max = 13		
				F(15 ,874) = 3.86		
corr(u_i, Xb) = 0.0256				Prob > F = 0.000		
		(Std. error. adjusted for 875 clusters in ISIN_num				
TobinsQ_wins	Coef.	Robust std. error.	t	P > t	95% conf. interval	
entropy_ motives_cd	.402668	.4414045	0.91	0.362	−.4636688	1.269005
FirmDistress_cd	.015449	.0053386	2.89	0.004	.0049711	.0259268
Interaction	−.028374	.0329084	−0.86	0.389	−.0929628	.0362148
Time fixed effects	yes					
_cons	1.883902	.1192948	15.79	0.000	1.649764	2.118039
sigma_u	1.6871311					
sigma _e	.88236074					
rho	.78522303	(fraction of variance due to u_i)				

Table B4
Continuous variable specification model

Fixed effects (within) regression	Number of obs = 1791
Group variable: ISIN_num	Number of groups = 875
R-squared:	Obs per group
Within = 0.0521	Min = 1
Between = 0.0279	Avg = 2.0
Overall = 0.0209	Max = 13
	F(17 ,874) = 6.75
corr(u_i, Xb) = −0.9916	Prob > F = 0.000

(Std. error. adjusted for 875 clusters in ISIN_num

TobinsQ_wins	Coef.	Robust std. error.	t	P > t	95% conf. interval	
entropy_ motives_cd	.4135802	.4416422	0.94	0.349	−.453223	1.280383
FirmDistress_cd	.0199576	.0062075	3.22	0.001	.0077743	.0321409
Interaction	−.0274945	.0330562	−0.83	0.406	−.0923741	.0373834
Size	−.00246	0.000864	−2.84	0.005	−0.00415	–0.000759
FirmAge	.3933547	.0545258	7.21	0.000	.286338	.5003714
Time fixed effects	yes					
_cons	−7.567895	1.334988	−5.67	0.000	−10.18802	−4.947702
sigma_u	9.7014					
sigma _e	.88034104					
rho	.99183293	(fraction of variance due to u_i)				

Table B5
Dummy specification model

Fixed effects (within) regression	Number of obs = 1791
Group variable: ISIN_num	Number of groups = 875
R-squared:	Obs per group
Within = 0.0493	Min = 1
Between = 0.0431	Avg = 2.0
Overall = 0.0322	Max = 13
	F(17 ,874) = 3.17
corr(u_i, Xb) = 0.0338	Prob > F = 0.000

(Std. error. adjusted for 875 clusters in ISIN_num

TobinsQ_wins	Coef.	Robust std. error.	t	P > t	95% conf.	interval
entropy_ motives_cd	.3723629	.4487649	0.83	0.407	−.50842	1.253146
FirmDistress_cd	.0159362	.0052604	3.03	0.003	.0056117	.0262607
Interaction	−.0267100	.0339918	−0.79	0.432	−.093434	.0399963
Experience_ dummy	0 (omitted)					
Country Relatedness	.1372193	.0804163	1.71	0.088	−.0206124	.2950509
Industry Relatedness	−.0561773	.0804808	−0.70	0.485	−.2141355	.1017809
Time fixed effects	yes					
_cons	1.808745	1.321674	14.14	0.000	1.557731	2.059759

sigma_u	9.599	
sigma _e	.87947907	
rho	.99167648	(fraction of variance due to u_i)

Table B6

Fixed effects regression model N = 9068

Fixed effects (within) regression	Number of obs = 9068
Group variable: ISIN_num	Number of groups = 1013
R-squared:	Obs per group
Within = 0.0380	Min = 1
Between = 0.0472	Avg = 9.0
Overall = 0.0362	Max = 13
	F(19 ,1012) = 17.24
corr(u_i, Xb) = − 0.5782	Prob > F = 0.000

(Std. error. adjusted for 1013 clusters in ISIN_num

TobinsQ_wins	Coef.	Robust std. error.	t	P > t	95% conf. interval	
entropy_ motives_cd	−.0862747	.42132481	−0.40	0.686	−.5047337	.3321842
FirmDistress_cd	.0276767	.0124896	2.22	0.027	.0031683	.0521851
Interaction	−.0236737	.0292994	−0.81	0.419	−.0811682	.0338208
Experience_ dummy	0 (omitted)					
Country Relatedness	.164356	.0612299	0.27	0.088	−.1037166	.1365878
Industry Relatedness	−.0435648	.0584013	−0.75	0.456	−.1581662	.0710367
Size	−.00342	0.00107	−3.20	0.001	−0.00552	–0.000132
FirmAge	−.0505511	.0988854	−0.51	0.609	−.244595	.1434928

Time fixed effects	yes					
year						
2009	0.4971156	0.1105547	4.50	0.000	.2801729	.7140584
2010	0.7804889	0.2042872	3.82	0.000	.3796139	1.181364
2011	0.4191698	0.2985893	1.40	0.161	−.1667553	1.005095
2012	0.3696391	0.3936885	0.94	0.348	−.4029001	1.142178
2013	0.828687	0.4926872	1.68	0.093	−.1381184	1.795492
2014	0.8782113	0.5897425	1.49	0.137	−.2790468	2.035469
2015	1.133839	0.6871218	1.65	0.099	−.2145073	2.482186
2016	0.8479377	0.7830689	1.08	0.279	−.688687	2.384562
2017	0.882889	0.8835987	1.00	0.318	−.8510063	2.616784
2018	0.4772183	0.9781082	0.49	0.626	−1.442134	2.396571
2019	0.7223515	1.079804	0.67	0.504	−1.396559	2.841262
2020	0.9576379	1.180377	0.81	0.417	−1.358629	3.273905
_cons	3.04632	1.321674	1.38	0.169	−1.298338	7.390979
sigma_u	1.6965674					
sigma _e	1.2862721					
rho	.6349977		(fraction of variance due to u_i)			