UNIVERSITY OF TURKU
Turku School of Economics

Cash or Stock? The Impact of Payment Method on Acquirer Value Creation in Nordic M&A Transactions

Accounting and Finance,
Department of Accounting and Finance

Master's thesis

Author:
Roope Hiltunen

Supervisor:
Prof. Mika Vaihekoski

14.3.2026
Turku

Student's statement regarding the use of Artificial Intelligence (AI) for preparing and/or writing this thesis:

☐ **I have not used any AI-based tools.**

☒ **I have used AI-based tools**. Their use is documented in the Appendix. The AI tools were used in a way that complies with academic integrity guidelines.

The originality of this thesis has been checked in accordance with the University of Turku quality assurance system using the Turnitin Originality Check service.

Master's thesis

Subject: Accounting and Finance
Author: Roope Hiltunen
Title: Cash or Stock? The Impact of Payment Method on Acquirer Value Creation in Nordic M&A Transactions
Supervisor: Prof. Mika Vaihekoski
Number of pages: 96 pages (+ appendices 13 pages)
Date: 14.3.2026

Abstract

This thesis examines how the method of payment in Nordic mergers and acquisitions shapes both the stock market's immediate reaction to acquisition announcements and the acquiring firm's subsequent performance. While prior evidence, largely based on the U.S markets, often links stock-financed deals to adverse selection and weaker market responses, Nordic institutional features may alter how investors interpret payment choice.

Using a Nordic M&A sample, this thesis conducts an announcement-period event study and complements it with multivariate event-window regressions. To assess long-run outcomes, panel regressions are estimated for operating performance and valuation measures over several post-deal horizons. The thesis also employs propensity score matching based on pre-deal covariates to improve comparability between cash- and stock-financed deals. Balance diagnostics indicate substantial improvement in covariate balance after matching.

The findings are interpreted against the Nordic governance setting and ownership structure: concentrated ownership, high disclosure and listed acquirers' financing choices can alter the information content of the payment method relative to U.S. -centric evidence. The analysis reports associations rather than strong causal claims, and the scope is limited to listed acquirers and the market conditions of the study period. In this way, the study complements the payment-method literature by highlighting a context where signals may reflect contracting and governance features rather than opportunistic timing.

The results indicate that stock-financed acquisitions receive more favorable announcement-period abnormal returns than cash-financed acquisitions, reversing the canonical prediction. In the longer run, raw estimates suggest a cash advantage in operating performance when measured by ROA, but this difference attenuates markedly in the matched sample. Across ROIC and Tobin's Q, long-run differences are weak and not robust. Overall, the findings highlight that payment method signals are context-dependent and that selection and deal comparability are central to interpreting cash-stock contrasts in Nordic M&A.

Keywords: Mergers and acquisitions, method of payment, event study, cumulative abnormal returns, propensity score matching, Nordic markets, selection

Pro gradu -tutkielma

Oppiaine: Laskentatoimi ja rahoitus
Tekijä: Roope Hiltunen
Otsikko: Käteinen vai osake? Maksutavan vaikutus ostajayhtiön arvonluontiin pohjoismaisissa yrityskaupoissa
Ohjaaja: Prof. Mika Vaihekoski
Sivumäärä: 96 sivua (+ liitteet 13 sivua)
Päivämäärä: 14.3.2026

Tiivistelmä

Tässä tutkielmassa tarkastellaan, miten yrityskaupan maksutapa vaikuttaa markkinoiden välittömään reaktioon yrityskauppauutisen julkistuksen yhteydessä sekä ostajayhtiön myöhempään suoriutumiseen Pohjoismaisessa markkinakontekstissa. Aiempi, pitkälti Yhdysvaltoihin painottuva kirjallisuus, liittää osakevastikkeen usein informaatioepäsymmetriaan ja heikompaan markkinareaktioon, mutta pohjoismainen instituutioympäristö voi muuttaa maksutavan tulkintaa.

Aineistona käytetään pohjoismaista yrityskauppajoukkoa. Lyhyen aikavälin vaikutuksia analysoidaan tapahtumatutkimuksella ja monimuuttujaregressioilla eri tapahtumaikkunoissa. Pitkän aikavälin tarkastelussa estimoidaan paneeliregressioita sekä operatiivisille että arvostuspohjaisille mittareille käyttäen vertailuaseman parantamiseen propensity score matching -menetelmää. Tähän liitännäinen balanssidiagnostiikka osoittaa, että menetelmä parantaa kovariaattitasapainoa selvästi.

Tuloksia tulkitaan pohjoismaisen hallintoympäristön ja omistusrakenteen valossa: keskittynyt omistus, korkea läpinäkyvyys ja listattujen yhtiöiden rahoitusvaihtoehdot voivat muuttaa maksutavan informaatiosisältöä verrattuna aiempaan Yhdysvaltoihin painottuneeseen kirjallisuuteen. Analyysi keskittyy nimenomaan havaittuihin yhteyksiin ilman vahvoja kausaaliväitteitä, ja löydökset rajautuvat listattuihin ostajiin sekä tarkastelujakson markkinaolosuhteisiin. Näin ollen työ täydentää maksutapakirjallisuutta kontekstilla, jossa signaalit voivat heijastaa enemmän sopimus- ja hallintamekanismeja kuin opportunistista ajoitusta.

Tulokset osoittavat, että osakevastikkeella rahoitetut yrityskaupat saavat Pohjoismaissa keskimäärin myönteisemmän julkistusreaktion kuin käteisvastikkeella rahoitetut kaupat. Pitkällä aikavälillä raaka-aineistolla estimoidut tulokset viittaavat käteiskauppojen parempaan operatiiviseen suoriutumiseen ROA:lla mitattuna, mutta ero pienenee selvästi matched-otoksessa. ROIC:n ja Tobinin Q:n osalta erot ovat heikkoja eikä niille löydy robustia tukea. Kokonaisuutena maksutavan informaatiosisältö vaikuttaa olevan kontekstisidonnainen, nostaen sekä valikoitumisen että vertailukelpoisuuden kriittisiksi tekijöiksi erojen tulkinnassa pohjoismaisissa yrityskaupoissa.

Avainsanat: yrityskaupat, maksutapa, tapahtumatutkimus, epänormaalit tuotot, propensity score matching, Pohjoismaat, valikoituminen

TABLE OF CONTENTS

FIGURES

TABLES

1 Introduction

1.1 Background

In mergers and acquisitions, one of the most consequential choices is not only what to buy, but how to pay. The method of payment, whether cash, stock or a mixture of them, immediately reshapes ownership and financing, allocates risk between the parties and carries on information that markets try their best to interpret. Precisely because it sits at the intersection of financing, governance and market perception, payment method provides a clear lens for studying how acquisition decisions are priced in the short run and evaluated in the longer term in a Nordic setting.

While some deals are able to create substantial shareholder value, others disappoint. Moeller et al. (2004) show that this disappointment is true especially for larger acquirers. There are a lot of dynamics that determine the success of a certain deal, and these clear ambiguities call for more thorough research. With the majority of prior research conducted in either the US, UK or Asian markets, the gap for further research is strong in the Nordic landscape.

There are several different decisions to make in the deal structuring phase that could have an effect on the realized value from the transaction. These include, but are not limited to, the payment method, deal financing and intended ownership structures post-deal. The choice of the payment method is the point of interest in this thesis. The two main categories of methods, stock and cash, create interesting dynamics in terms of value transferring and creation. Faccio and Masulis (2005) provide more details into the decisions behind the payment methods and create an interesting link to the broader financial theory through corporate governance, agency costs and information asymmetry.

Another area of interest is the timespan. A modern corporation could have tens of thousands of owners, each with their specific demands and mandates. Therefore, focusing on value creation in M&A is more insightful if both short- and long-term are considered. While a larger portion of the current research focuses on short-term stock returns, this thesis also links payment method decisions to longer-term value indicators through rigorous empirical tools and analysis.

Earlier research on the topic suggests interesting relationships. Liu and Ma (2018) suggest, based on a sample of 905 transactions conducted by Chinese listed firms during the period 2009-2013, that the stock payment method is connected to better acquirer financial performance in the long-term compared to cash. Ismail and Krause (2010) also found the payment method to have an impact on returns and performance, with their dataset consisting of US listed companies from 1985 to 2004.

However, no clear conclusions can be made as the empirical results seem to vary to some extent by geographical location and market characteristics.

This thesis focuses specifically on the Nordic markets for several reasons, first of which is its underrepresentation in earlier studies. The phenomenon of value creation through M&A and the specific payment method dynamics have been looked into in many of the major markets in the world. The Nordics, however, have received less attention. The rare studies on this subject in the Nordics have concentrated on shorter-term value creation through event study methodologies, creating a gap this thesis intends to fill.

The Nordic market provides a particularly suitable setting for studying the relationship between payment method and value creation. Compared to the U.S, continental Europe and Asia, Nordic countries form a combination of strong investor protection, transparent institutions and relatively concentrated ownership structures. This creates a governance environment that is inherently different from the ones that have been the subject of more studies. These features make the Nordics a great testing ground for assessing different theoretical frameworks and their suitability to such markets.

This study examines how the method of payment in mergers and acquisitions affects value creation for listed acquiring firms in the Nordics. Specifically, it aims to investigate whether cash- and stock-financed acquisitions differ in terms of short-term market reactions and long-term performance outcomes. Differing time spans call for different methodological choices. For the short-term effects, event study methodology is chosen much like prior studies from for example Travlos (1987). On the longer horizon, this study analyses the phenomenon through panel regressions, a method also utilized by Loughran and Vijh (1997).

The clear endogeneity problem in the payment choice is also acknowledged by this study. Because firms self-select into cash or stock based on their characteristics and information sets, raw return and performance statistics can reflect selection rather than the causal effect of the payment method. To mitigate this, the thesis uses propensity score matching (PSM) to pre-balance cash- and stock-paid deals on observable firm-level covariates, thereby attributing any remaining differences more credibly to the payment method rather than composition effects (Rosenbaum & Rubin, 1983). Operationally, we implement nearest-neighbor matching with a caliper under common support, verify balance with standardized mean differences and then evaluate performance with regressions in the matched sample. This yields a cleaner comparison and a more robust identification of the payment-method effect on returns.

The combination of an event study, panel regressions and PSM allows the full scope of value creation in M&A to be captured. This configuration enables more credible analysis by integrating market-based expectations, realized firm performance and statistical control. By doing so, this thesis provides a multi-perspective approach to understanding the connection of financing decisions to value creation in M&A transactions. It combines elements from prior literature to provide a more comprehensive understanding of the less-researched Nordic markets.

1.2 Research questions and limitations

The objective of this study is to investigate how the method of payment in mergers and acquisitions influences value creation for acquiring firms within the Nordic market context. Building on prior research, the analysis makes a clear difference between short-term market reactions and long-term performance outcomes. By doing so, this thesis provides a comprehensive view of how payment choices affect success in acquisitions. This study also acknowledges the inherent dynamics of the payment decision, which are influenced especially by firm-specific characteristics. These factors are taken into account in the empirical design of this thesis.

The research is guided by the following questions:

- RQ1: Do announcement-period abnormal returns differ between cash- and stock-financed acquisitions in Nordic public M&A?
- RQ2: Do post-acquisition operating and market-based outcomes differ between cash- and stock-financed acquisitions over the longer run?
- RQ3: How should any observed cash-stock differences be interpreted in light of Nordic institutional features and what does this imply for the external validity of prior evidence?

By answering these questions, this thesis aims to provide both theoretical and empirical insights into how financing decisions in acquisitions translate into shareholder value. By examining the short- and long-term effects within a distinct institutional setting, the study tests whether established theories of signaling, exchange-medium and agency costs hold in the Nordic environment. Further, by applying advanced empirical techniques such as event study analysis, panel regression and propensity score matching, the research seeks to ensure that the observed relationships are robust and not driven by sample selection or firm-specific bias.

The empirical part of this study relies primarily on LSEG Workspace as a data source. Workspace provides detailed information on M&A transactions, including deal characteristics, payment methods, announcement dates, accounting data and market data for listed acquirers. This availability enables the calculation of short-term abnormal returns and the examination of post-acquisition financial performance across several years. For further data analysis, Microsoft Excel is used in more trivial settings, with RStudio being the tool of choice for more sophisticated modelling.

The dataset focuses on completed M&A transactions involving listed acquirers headquartered in the Nordic countries between 2000 and 2019. This timeframe ensures a sufficiently large sample while including several different merger waves, phases when a significant number of transactions occur. The long-run analysis is done on a sample of 1050 transactions, providing a robust basis for statistical analysis.

Like any empirical study, this research is also subject to several limitations that may influence the interpretation of the results. First, the analysis focuses on listed acquirers in the Nordic region, which improves data reliability but limits the generalizability of the findings to private or unlisted firms. The study also relies mainly on secondary data sources, such as LSEG Workspace, for information. The sources may contain inconsistencies in deal reporting or accounting standards across countries. It should also be noted that the analysis captures only observable firm- and deal-level characteristics, meaning that unobservable factors such as managerial motives or cultural integration challenges cannot be controlled for.

Despite these obvious constraints, the chosen research methodology mitigates many of these concerns by improving internal validity and ensuring that the results are not driven by observable selection bias. The limitations are thus acknowledged but do not compromise the study's ability to provide meaningful insights into the relationship between payment method and value creation in Nordic mergers and acquisitions.

1.3 Structure of the thesis

This thesis progresses from theory to empirical evidence in a way that mirrors the underlying research logic. It first establishes why the method of payment in acquisitions is not merely a technical detail but a decision that carries significant information content and reflects financing constraints, governance considerations and selection mechanisms. These mechanisms are interpreted within the Nordic institutional environment, which provides a distinct setting characterized by strong investor protection, high transparency and relatively concentrated ownership structures.

Against this backdrop, Chapter 2 develops the theoretical and empirical foundations of the study. It introduces mergers and acquisitions as an economic phenomenon, discusses how value creation is conceptualized and measured and reviews the key theoretical channels linking payment method to both short-run market reactions and long-run performance. The chapter further surveys prior empirical evidence, with particular attention to endogeneity concerns and cross-country differences and concludes by identifying the research gap and formulating testable hypotheses.

Chapter 3 describes the data and empirical methodology. It presents the construction of the Nordic M&A sample, outlines data sources and variable definitions and discusses data-related limitations. The chapter then details the empirical strategy, combining an event-study framework for announcement-period effects with panel regressions for long-run performance, complemented by propensity score matching to improve comparability.

The following chapter presents the empirical results. It begins with descriptive statistics, proceeds to the analysis of announcement-period abnormal returns and then evaluates post-acquisition operating and valuation performance using both full-sample and matched-sample designs. The results are interpreted in light of the theoretical mechanisms and the Nordic market context, and their robustness is assessed.

Chapter 5 synthesizes the findings and discusses their implications. It brings together the short-run and long-run evidence, relates the results to existing theories of payment method choice and reflects on the role of Nordic institutional features. The chapter also addresses the limitations of the study. The following and final chapter concludes by summarizing the main contributions of the thesis.

2 Theory

2.1 Mergers and acquisitions

Mergers and acquisitions (M&A) refer to transactions in which corporate assets and control are reallocated through the combination of firms, typically either by integrating a target into an existing organization (acquisition) or by forming a new combined entity (merger). In corporate finance, M&A is distinctive because it bundles strategic decision-making with major financing and governance choices. Transactions are large, discrete, and highly visible events, often requiring the acquirer to commit substantial financial resources while simultaneously managing integration challenges related to operations, culture, and management systems (Sudarsanam, 2010). As such, M&A provides a natural setting for studying how financing decisions are interpreted by markets and how these decisions relate to subsequent value creation.

M&A activity is also shaped by broader forces that affect firms' incentives and opportunities to restructure and grow. Technological disruption, globalization, and shifts in competitive dynamics can motivate acquisitions as a response to changing market conditions, while regulatory and capital-market developments can influence both deal feasibility and financing capacity (Bruner, 2004; Martynova & Renneboog, 2008a). Importantly for this thesis, payment method is not merely an implementation detail: the choice between cash and stock can alter ownership and risk allocation and may carry informational content at announcement, making it directly relevant for both short-run market reactions and longer-run post-acquisition outcomes.

2.1.1 Market developments

A central empirical regularity in the M&A literature is that deal activity tends to cluster in "merger waves," with periods of elevated transactions reflecting common economic, regulatory, and technological conditions (Andrade et al., 2001; Harford, 2005). These waves matter because market conditions can influence both the volume of deals and the nature of transactions undertaken. The types of targets acquired, the competitive intensity of bidding, and the financing environment available to acquirers are just a few examples of factors that vary with the broader conditions. In practice, this implies that observed payment choices and outcomes should be interpreted in light of time-varying conditions that affect valuation, liquidity, and financing constraints.

In Europe, capital-market integration has been an important structural shift underlying cross-border deal activity. The gradual liberalization and integration of European financial markets during the 1990s and 2000s reduced barriers and transaction costs, facilitating increased cross-border

acquisitions and encouraging firms to expand beyond domestic markets (Campa & Hernando, 2004). For Nordic acquirers, these developments are particularly relevant given the region's international orientation and the prevalence of cross-border transactions, which can introduce additional valuation uncertainty and integration complexity (Martynova & Renneboog, 2008b). Overall, merger waves and European integration underscore that M&A and, by extension, financing choices within M&A, are embedded in time-varying market environments rather than being constant across periods.

In the 2010s, Nordic M&A activity became more dynamic not only in terms of deal volume, but also in terms of sectoral breadth and the international character of transactions. A prolonged period of low interest rates and strong investor confidence supported deal financing and contributed to an environment in which acquisitions were frequently used as instruments for strategic repositioning and consolidation. Cross-border transactions involving Nordic acquirers expanding into other European markets became a defining feature of the decade, consistent with broader European evidence of increasing international M&A integration (Martynova & Renneboog, 2008b). At the same time, technological innovation and digital transformation spurred consolidation pressures in sectors such as telecommunications, fintech, and energy where scale, platform dynamics, and capability acquisition became increasingly important in corporate strategy.

Taken together, merger waves and the increasing internationalization of Nordic deal-making highlight two features that are important for this thesis. First, the timing of acquisitions is likely to coincide with changing valuation and financing conditions, which can influence both the feasibility of cash offers and the attractiveness of stock as acquisition currency. Second, the growing prevalence of cross-border transactions can increase valuation uncertainty and integration complexity, potentially affecting how markets interpret payment method at announcement and how value creation materializes in the longer run. These patterns provide context for studying payment choices and outcomes in Nordic acquisitions across both short- and long-horizon perspectives.

2.1.2 M&A rationales

Beyond listing motives, it is useful to emphasize that different rationales imply different mechanisms for how value creation is expected to appear in empirical outcomes. Efficiency- and capability-driven acquisitions ultimately require successful integration and the realization of synergies, which are not fully observable at the announcement and may take time to materialize. Market reactions can therefore reflect investors' expectations about synergy potential, integration risk, and the credibility of managerial plans rather than realized performance. In contrast, motives related to market power, strategic repositioning, or pre-emptive consolidation may generate value primarily through

competitive dynamics that unfold over longer horizons and can be sensitive to industry conditions and regulatory responses (Bruner, 2004; DePamphilis, 2018).

Agency-based motives introduce a different set of implications. If acquisitions are driven by managerial incentives that are imperfectly aligned with shareholder value, announcement reactions may reflect investors' scepticism about managerial discipline, but realized outcomes may depend on whether governance mechanisms constrain post-acquisition behaviour and integration execution (Weston et al., 1998). This highlights a general distinction that is central for interpreting empirical results: the market's immediate pricing of an acquisition reflects a forward-looking assessment under uncertainty, whereas longer-run operating and valuation outcomes reflect realized execution and the interaction of the deal with subsequent market conditions (Sudarsanam, 2010; DePamphilis, 2018).

Importantly, acquisition motives are also linked to heterogeneity and selection in deal design. Firms do not choose acquisitions and their financing mechanisms randomly, as the type of target, the strategic setting, and the financing environment influence both the decision to acquire and the chosen payment method. As a result, observed differences between cash- and stock-financed acquisitions may reflect not only the consequences of financing choices, but also systematic differences in the underlying transactions that firms undertake (Bruner, 2004; Sudarsanam, 2010). This perspective motivates evaluating acquisitions using complementary short-run and long-run lenses and treating payment method as part of a broader transaction design.

2.1.3 Institutional and ownership environment in the Nordics

The Nordic markets provide a distinct institutional context for studying mergers and acquisitions and their outcomes. Compared to the dispersed ownership structures typically associated with Anglo-American markets, Nordic listed firms more often exhibit concentrated ownership, with control frequently held by founding families, industrial groups, state entities, or foundations. At the same time, Nordic countries are commonly characterized as having relatively strong investor protection and high enforcement quality within a civil law tradition (La Porta et al., 1998). The combination of concentrated ownership alongside comparatively strong formal institutions creates a governance environment that differs both from the market-based U.S. model and from more relationship-based continental European settings.

A useful way to summarize these features is the notion of a "Nordic corporate governance model". In this view, Nordic governance is marked by the presence of strong and identifiable owners, comparatively robust minority shareholder protections, and board-level oversight practices that

emphasize engagement and longer-term orientation (Thomsen, 2016; Lekvall, 2014). Importantly, the distinctiveness of the setting is not explained by ownership concentration alone, but by the interaction between ownership structures and institutional quality: concentrated ownership can coexist with relatively high investor confidence, even though majority–minority conflicts remain relevant in large corporate decisions such as acquisitions (Thomsen, 2016; Lekvall, 2014).

Nordic ownership structures are also frequently associated with control-enhancing mechanisms that can separate voting rights from cash-flow rights, including dual-class shares and layered control structures. Sweden is often highlighted as an illustrative case where stable controlling owners have remained central in many large listed firms, supported by institutional arrangements and the persistence of control blocks (Henrekson & Jakobsson, 2011). More broadly, evidence from Western Europe documents that concentrated and family control is common outside the Anglo-American setting and that ultimate ownership patterns differ systematically across countries (Faccio & Lang, 2002). For corporate transactions, this matters because ultimate control is often exercised through voting blocks rather than dispersed share ownership, implying that control rights may be disproportionately concentrated relative to cash-flow claims.

The economic value of control provides additional descriptive background for why ownership and voting rights can be salient in the Nordic setting. Cross-country evidence on dual-class firms suggests substantial variation in the control premium embedded in votes (Nenova, 2003), and evidence from Swedish takeover situations indicates that the relative pricing of voting rights can shift materially when control is contested (Rydqvist, 1996). At the same time, the separation of ownership and control is associated with well-known governance frictions: European evidence links disproportional ownership structures to valuation discounts and incentive–entrenchment trade-offs (Bennedsen & Nielsen, 2010) and firms with more complex ownership structures may exhibit systematically different valuation outcomes (Laeven & Levine, 2008). Taken together, these stylized facts clarify why ownership structure and control rights are first-order institutional characteristics in the Nordic context.

In addition to governance and ownership structures, Nordic listed firms operate within a relatively harmonized European reporting and disclosure framework. A particularly salient institutional anchor is the EU IAS Regulation, which required IFRS reporting for the consolidated accounts of EU-listed firms starting from financial years beginning in 2005 (European Parliament & Council of the European Union, 2002). By increasing comparability in financial reporting across listed firms, this framework contributes to an environment in which investors and analysts can more readily

benchmark firms across countries and industries (IFRS Foundation, 2024). Empirical accounting research has examined the economic consequences of mandatory IFRS adoption internationally, such as changes in market liquidity, cost of capital, and valuation-related outcomes, highlighting that listed Nordic firms are embedded in a reporting regime explicitly designed to improve transparency and comparability (Daske et al., 2008).

Finally, the Nordic corporate landscape is characterized by a high degree of international integration. As European capital markets became more liberalized, Nordic firms increasingly participated in cross-border transactions, and global capital flows have blurred the line between domestic and international governance practices (Campa & Hernando, 2004; Martynova & Renneboog, 2008b). Comparative evidence also suggests that institutional quality is linked to cross-country M&A activity: countries with better accounting standards and stronger shareholder protection tend to exhibit larger M&A volumes, consistent with the idea that institutions shape both the feasibility of takeovers and the governance role of the market for corporate control (Rossi & Volpin, 2004). Overall, the Nordic setting combines relatively high institutional quality with internationally oriented listed firms, providing a well-defined context for examining acquisition behaviour and outcomes.

2.2 Value creation in M&A

The main goal of any corporation is to create shareholder value. Understanding whether or not M&A activity is able to do this and to whom the value is created have been central questions in corporate finance and strategic management research for decades. Although these transactions are often justified by potential synergies, efficiency gains or market expansions, empirical evidence on their actual value outcomes remains mixed. The notion of value serves as a critical benchmark for evaluating the success of these transactions, linking theoretical expectations with observable outcomes.

A key challenge in assessing value creation in M&A is that success is not a single observable outcome. Transactions could create value through multiple channels, yet the timing and measurability of these effects can differ substantially. Market-based measures capture investors' forward-looking assessment at the time information is released, whereas accounting-based measures reflect realized operating outcomes with a delay. For this reason, empirical research commonly creates a distinction between short-horizon announcement effects and longer-horizon performance, treating them as complementary rather than interchangeable indicators of value creation.

2.2.1 Concept and measurement of value creation

The concept of value creation lies at the core of any M&A activity as it represents the ultimate end goal of these transactions from a shareholder perspective. In economics, value creation can be summarized as a net positive change in firm value which, in M&A terms, results from the combination of two entities compared with their stand-alone valuations (Seth, 1990). It implies that the merger or acquisition generates synergies or efficiencies that increase the total wealth of shareholders beyond what would have been achieved independently. From this perspective, M&A transactions can be viewed as mechanisms of resource reallocation and efficiency improvement in the market for corporate control (Jensen & Ruback, 1983).

There are several complementary angles from which value creation can be assessed, particularly in terms of time. The most widely used measure is the immediate short-term market reaction to deal announcements, typically examined through event studies around the announcement date. These returns reflect investors' expectations about the present value of expected future synergies and integration costs. For acquiring firms, positive abnormal returns signal that investors perceive the transaction as value-enhancing, while negative or insignificant reactions may indicate overpayment, poor strategic fit or information asymmetries (Travlos, 1987; Moeller et al., 2004).

Whereas short-term returns are an indicator of the initial value creation properties of a merger, this study intends to find meaningful insights on long-term value creation as well. Several studies point out the importance of evaluating post-merger operating and financial performance to determine whether the anticipated synergies materialize (Healy et al., 1992). These can be examined through accounting-based indicators, such as return on assets (ROA), return on invested capital (ROIC) or market-based measures like Tobin's Q. Empirical findings on the long-term value creation of M&A are mixed, as the transactions often face trouble in terms of integration challenges or simply overestimating the synergies.

2.2.2 Mechanisms of value creation and destruction

The mechanisms through which mergers and acquisitions create or destroy value have been discussed to a large extent in both financial economics and strategic management literature. At their very core, M&A transactions are undertaken with the expectation that the combined entity will be more valuable than the sum of the independent firms, a concept commonly referred to as synergy (Weston et al., 1998; DePamphilis, 2018). Synergies could take multiple different forms, with operational, financial and managerial often being cited as the most important.

Operational synergies refer to cost efficiencies and improvements in productivity that arise from economies of scale, scope or integration of complementary resources (Sudarsanam, 2010). Financial synergies, on the other hand, stem from reduced cost of capital, better utilization of leverage or improved internal capital allocation (Damodaran, 2005). Managerial synergies may also emerge when superior management practices from one firm are transferred to another, improving overall efficiency (Healy et al., 1992).

However, the realization of these anticipated benefits is often not as easy as thought prior to the transaction. A significant stream of literature points out that value creation is conditional on the effectiveness of the integration and the ability of management to capture expected synergies (Capron, 1999). Poor integration post-transaction often results in cultural clashes, coordination difficulties and turnover among key personnel, which in turn undermine operational performance (Cartwright & Schoenberg, 2006; Marks & Mirvis, 2011). These findings suggest that even when synergies appear sound on a theoretical basis, execution risk can lead to eroding value.

Taken together, the mechanisms of value creation and destruction demonstrate that M&A performance is a multidimensional phenomenon influenced by both firm-level and contextual factors. Value creation depends not only on the realization of strategic and financial synergies but also on managerial discipline, effective integration and timing relative to market conditions.

2.3 Role of payment methods

The method of payment represents one of the most critical financial decisions in mergers and acquisitions, linking the acquirer's strategy with the overall outcome of the corporate transaction. Previous sections have showcased that value creation in M&A depends not only on synergies and post-merger integration but also on how the deal is structured and financed. Among the various transaction characteristics, the payment method plays a particularly prominent role because it influences ownership distribution, information signaling and shareholder wealth (Faccio & Masulis, 2005).

The financing of an acquisition is part of the transaction's economic content, not just its implementation. Because payment choice responds to bidder and deal characteristics, it is inherently endogenous and its observed association with outcomes must be interpreted through mechanisms that link financing choices to market reactions and realized performance. The more central mechanisms in literature include, but are not limited to, signaling under information asymmetry, agency considerations and market-timing interpretations of equity as acquisition currency.

2.3.1 Definition and types of payment methods

In M&A, the method of payment refers to the form of consideration offered by the acquiring firm to the target's shareholders in exchange for ownership. In a broad sense, three types of payment can be distinguished: cash, stock and hybrid offer. Each method entails distinct implications for financing, ownership structure, taxation and market perception, making payment choice a very central aspect of deal structuring (Faccio & Masulis, 2005).

In a cash offer, the acquirer purchases the target's shares or assets using available liquidity, debt financing or both. Such transactions result in immediate ownership transfer and tend to signal managerial confidence in the valuation and future prospects of the acquiring firm (Travlos, 1987). Through cash payments the dilution of shareholders is avoided but extensive use of cash might increase financial leverage as the acquirer's cash reserves are used.

Conversely, a stock offer involves the issuance of new shares by the acquirer to the target's shareholders, who then become part-owners of the new combined entity. This form of consideration preservers liquidity but has a diluting effect on existing ownership whilst also exposing the deal parties to post-merger performance risks.

An important practical nuance is that acquisition financing is not always purely cash- or stock-based, as a bulk of transactions use hybrid consideration structures that combine cash and equity. Hybrid offers can be thought of as a compromise in deal design, allowing the parties to share valuation and integration risk more flexibly than a pure cash or pure stock offer. Empirical studies commonly treat hybrid payment as a distinct category or exclude it when focusing on the clearest contrast between cash and stock, acknowledging that hybrids can reflect heterogeneous combinations of motives and constraints (Bruner, 2004; DePamphilis, 2018). In this thesis, the empirical analysis emphasizes the clean comparison between predominantly cash- and stock-financed deals.

Ultimately, the method of payment has a foundational effect that determines the financing structure of the transaction and conveys information to the market. This importance lies at the intersection of corporate finance, governance and strategic management, forming the basis for understanding how financing decisions influence post-merger value creation.

2.3.2 Theoretical foundations

The theoretical background of this thesis has deep roots in the very basis of corporate finance. The relevant theories include signaling theory, the agency cost frameworks and theories of market timing. Each of these offer a distinct rationale for why the method of payment may have an influence on both

short- and long-term outcomes in acquisitions. These frameworks provide a rather rich theoretical ground for understanding the link between payment method and value creation in M&A.

According to the signaling theory (Myers & Majluf, 1984), managers possess private information about the true value of the firm, hence having an informational advantage when compared to investors and other market participants. The choice of payment in acquisition can therefore signal managerial beliefs: using stock may indicate overvaluation, whereas paying in cash signals confidence in firm value. Empirical studies, such as Travlos (1987), confirm that stock-financed acquisitions often generate negative short-term abnormal returns, whereas cash financing was connected to more neutral returns. This seems to be consistent with the information asymmetry argument.

Beyond the broad signaling intuition, more deal-specific theoretical literature models the method of payment as the exchange medium chosen under acquisition-specific frictions. In these models, payment choice is not only a financing decision but a contractual device that allocates valuation risk and information rents between bidder and target. Hansen (1987) develops a classic framework in which stock can be an efficient medium of exchange when there is substantial uncertainty about the value of target or the gains from combination, because contingent payoffs embedded in equity allow the parties to share valuation risk. In contrast, cash transfers more valuation risk to the bidder and is therefore more attractive when the bidder's confidence about value and synergies is high and when the bidder has relatively favorable information or capacity.

Exchange-medium models also show that cash may carry strategic advantages in competitive takeover settings. Fishman (1989) claims that cash could function as a pre-emptive medium of exchange. This means that a cash offer can credibly deter competition by signaling a high valuation of the target, thereby increasing the likelihood of acceptance and reducing the probability of rival bids. This perspective refines the simple story of cash and confidence by linking the payment choice to bidder competition and bargaining dynamics, not only to acquirer's valuation relative to market beliefs.

Relatedly, formal asymmetric-information models emphasize that the mix of cash and securities can be informative about bidder value and deal quality. Eckbo etl al. (1990) present a separating-equilibrium logic in which a higher cash fraction may be associated with higher bidder quality under information asymmetry, even though empirical tests may not always cleanly support all model restrictions. Collectively, these exchange-medium theories motivate why announcement reactions can differ. Markets can interpret cash as both a valuation signal and a commitment device that shifts

risk and discourages low-quality bids, while stock could be interpreted as risk-sharing under uncertainty or as a weaker commitment when information frictions persist.

The payment method decision is also connected to other classic corporate theories. One such was introduced by Jensen (1986), who highlighted how managerial incentives influence financing and investment decisions. According to the theory, firms with substantial free cash flow may be tempted to pursue actions that do not maximize shareholder value, including acquisitions. The choice of cash as a payment method imposes financial discipline while stock payments may have a diluting effect, weakening monitoring and potentially reducing long-term performance.

An agency-based interpretation also implies that the payment method is likely to be jointly determined with bidder characteristics and deal opportunities. If managers have incentives to pursue growth or empire-building, the availability of internal funds can facilitate cash offers, while equity offers may be preferred when managers wish to avoid immediate financing constraints or when equity issuance is comparatively cheap. Conversely, when monitoring is strong and managerial discretion is constrained, the scope for value-destroying acquisitions financed by readily available cash should be reduced.

This agency lens points to an important empirical implication: differences observed between cash- and stock-financed acquisitions may partly reflect selection into payment type, rather than a pure causal effect of the payment method itself. This issue is built into the very core of this thesis through empirical choices, fulfilling methodological gaps in prior research.

Another point of view has been provided by Baker and Wurgler (2002). They introduced the market timing theory, which suggests that firms prefer equity financing when their shares are overvalued. It builds on the concept of the signaling theory introduced earlier. In the context of M&A, acquirers may issue stock to take advantage of favourable market conditions. In a similar fashion, stock payments allow risk sharing between acquirer and target, which can be desirable in more uncertain environments. This theory arguments that timing of specific transactions is contingent on the broader market environment at a certain time.

While this market-timing view provides an important capital-structure intuition, M&A research has also developed payment-choice predictions in models where misvaluation directly shapes who acquires whom and how the deal is paid for. Shleifer and Vishny (2003) propose a stock market driven acquisition framework in which relative mispricing creates incentives for overvalued bidders to use equity as acquisition currency to purchase less-overvalued targets. In this setting, stock

financing is not only a signal but an instrument for exploiting a temporarily high valuation. It can explain the clustering of stock-financed deals during high-valuation periods and the association between equity payment and weaker subsequent performance if valuations mean-revert.

A complementary rational mechanism is provided by Rhodes-Kropf and Viswanathan (2004), who show how stock-financed merger waves can arise even when targets behave rationally. The key insight is that bidders and targets may face correlated valuation errors and incomplete information about the sources of mispricing, making it difficult for targets to fully disentangle synergy-driven bids from valuation-driven bids in real time. Consequently, high market valuations can coincide with elevated merger activity and greater reliance on stock as an acquisition currency, without requiring targets to be systematically irrational. Empirically, Rhodes-Kropf et al. (2005) provide evidence consistent with valuation-related components of market-to-book ratios being associated with merger activity patterns, strengthening the link between market-wide valuation conditions and the compositions of deals by payment type.

The mechanisms discussed above map naturally into the different empirical outcome families examined in this thesis. First, short-horizon announcement returns primarily capture how markets update beliefs about the value implications of the transaction and the information content of the chosen payment medium. Under semi-strong market efficiency, prices should incorporate the information revealed by the deal and its financing at announcement, so abnormal returns can be interpreted as investors' immediate reassessment of expected synergies, integration risk and informational frictions (Fama, 1970; Kothari & Warner, 2007).

Second, longer-horizon operating outcomes, such as ROA and ROIC, reflect realized post-deal implementation: integration quality, efficiency gains and capital allocation that materialize only after the announcement. Third, longer-horizon market-based measures may reflect both learning about realized performance and broader valuation dynamics, including potential revaluations and mean reversion.

Importantly, these outcome categories need not move in lockstep. A strong announcement reaction can coexist with weak or mixed long-run accounting results if the payment method partly reflects selection into deal type, if integration execution differs or if market-level valuation conditions evolve after the deal. This motivates the triangulation of short-run market reactions with post-acquisition performance rather than treating any single metric as a sufficient summary of acquisition success.

In sum, information-based theories imply that payment method can shape announcement reactions because it affects how markets infer bidder valuation, uncertainty and financing constraints at the time of the deal. However, these reactions need not map one-to-one into long-run outcomes. Payment choice is endogenous, and the same factors that influence the market's interpretation can also influence which deals are undertaken and how they are structured. The core theoretical foundations and their implications on value creation are summarized in Figure 1.

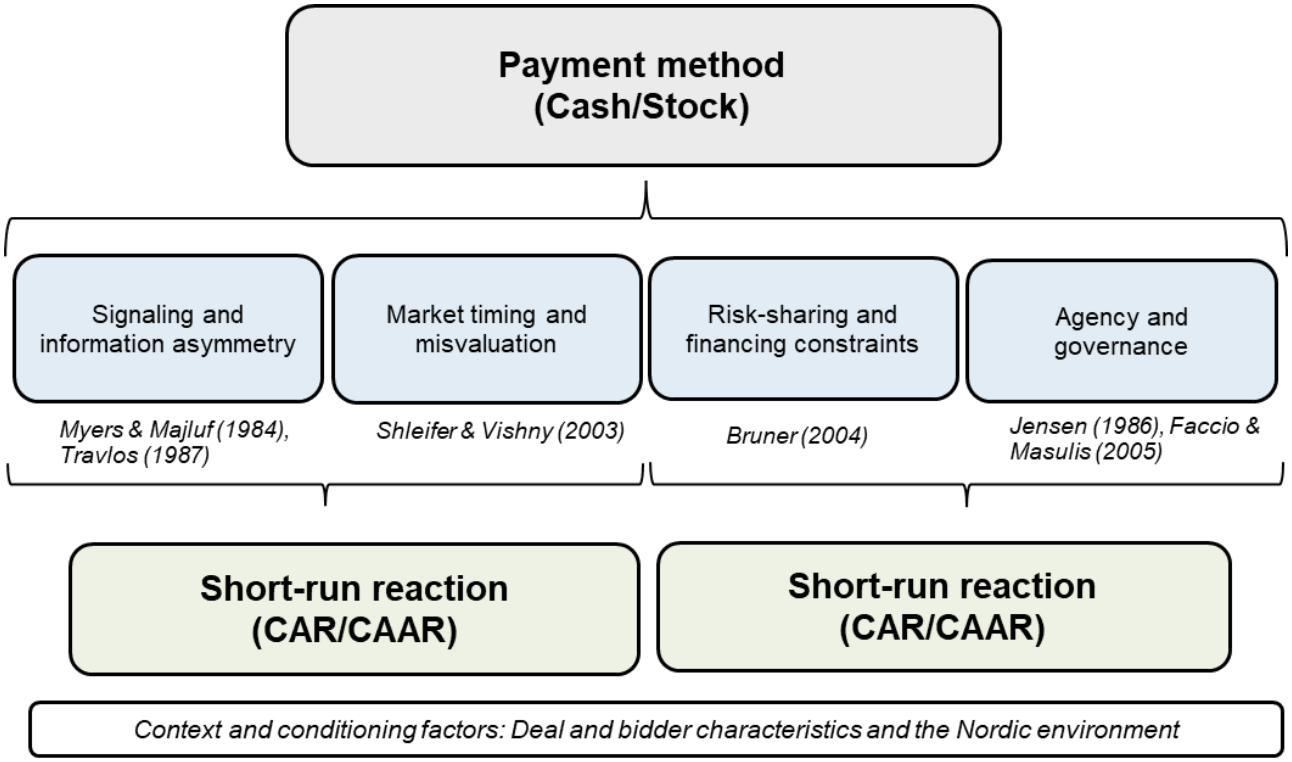

Figure 1. The theoretical framework

A summary of the core theories accompanied by their links to the value creation timeline.

2.3.3 Endogeneity and the determinants of payment choice

A key implication of the theoretical literature is that the method of payment is a choice variable, jointly determined with bidder characteristics, deal attributes and market conditions. Conceptually, determinants of payment choice can be grouped into four broad categories.

1) Valuation conditions
2) Financing constraints
3) Uncertainty and risk allocation
4) Governance and control considerations

Because these determinants vary systematically across firms and deals, cash- and stock-financed acquisitions may differ ex ante even before any performance differences are realized. This selection logic provides the theoretical motivation for treating comparisons of long-run outcomes across payment types as an identification challenge and for using matching-based approaches to improve comparability by conditioning on observables.

The payment method decision is a combination of several different factors dependent for example on the firm acquiring, market sentiment and the acquisition target. As covered previously, the decision is also influenced by information asymmetries, managerial incentives and firm-specific characteristics (Myers & Majluf, 1984; Travlos, 1987; Jensen, 1986).

It can also be noted that firms with strong cash positions and higher profitability are more likely to finance acquisitions with cash, whereas those facing tighter financial constraints or higher market valuations may prefer to use stock as "acquisition currency". This implies a certain level of endogeneity, which means that the decision is jointly determined with both firm performance and market expectations. Consequently, there is a risk of capturing selection effects while comparing post-acquisition outcomes rather than actual causal relationships. As this study is mainly interested in these possible causalities, the problem of endogeneity needs to be controlled for.

Recognizing this endogeneity is crucial for empirical analysis. Addressing it requires econometric techniques that control for the self-selection bias inherent in payment choice decisions. One such method is propensity score matching, which enables the construction of comparable groups of acquirers that are similar in observable characteristics but differ in payment method. This approach improves causal inference and will be used in conducting this study.

2.3.4 Institutional environment as a moderating mechanism

Institutional and ownership environments can shape how acquisition financing choices are made and further interpreted. In particular, the method of payment is not just a financing decision but also a governance-relevant choice. It could affect ownership stakes and influence how markets infer managerial information at the announcement. The theories and their real-value implications covered previously could face changes as the institutional environment switches toward the Nordic context.

A relatively transparent information environment can plausibly weaken the classic adverse-selection interpretation of equity financing. In standard financing theory, issuing equity can be interpreted as a negative signal when managers are better informed about firm value than outside investors, implying that equity may be used when the bidder is overvalued (Myers & Majluf, 1984). In the M&A context,

this logic has often been linked to less favourable bidder reactions to stock offers and cash outperformance (Travlos, 1987). However, if disclosure quality is high and enforcement is strong, information asymmetries may be smaller, and the "equity equals bad news" signal may be less pronounced. Under such conditions, the method of payment may convey relatively more deal-specific information, such as risk-sharing or valuation uncertainty, and relatively less pure misvaluation signaling. This perspective is consistent with the idea that institutional transparency can influence how markets interpret payment choices, even when the underlying theories remain unchanged. (Daske et al., 2008).

On a second note, concentrated ownership and control-enhancing mechanisms can shape payment choice through dilution costs and selection. In settings where controlling shareholders are common and voting rights can be separated from cash-flow rights, control is economically meaningful and can carry a measurable premium (Nenova, 2003; Rydqvist, 1996). Equity-financed acquisitions typically require issuing new shares and therefore may dilute existing owners' control, making stock payment privately costly for controlling shareholders. This creates a straightforward selection logic: stock-financed acquisitions may be undertaken primarily when the strategic rationale is strong enough to justify dilution, when the target's bargaining position requires equity as currency, or when risk-sharing considerations dominate rather than because equity is opportunistically timed. In other words, control preservation motives can make equity payment less attractive ex ante and may lead to a more selective set of stock-financed transactions in concentrated-ownership environments (Faccio & Masulis, 2005).

Closely related to ownership concentration is the monitoring channel emphasized in corporate governance theory. Strong owners and active monitoring can discipline managerial decision-making and curb value-destroying expansion, which is central to agency-based views of acquisitions (Jensen, 1986). If managerial discretion is constrained by governance and ownership structures, the agency-driven predictions about acquisition behaviour may differ from those in dispersed-ownership settings: for example, the role of free cash flow in enabling empire-building may be mitigated when monitoring is strong. This does not eliminate agency problems, but it implies that the interaction between financing choices and acquisition outcomes is likely shaped by the prevailing governance regime (Shleifer & Vishny, 1997). In a Nordic context, this strengthens the case for treating payment method not as a stand-alone determinant of outcomes, but as a choice embedded in a governance structure that affects both deal selection and post-acquisition execution.

The presence and role of institutional investors may condition market-timing interpretations of stock payment. Stock-market-driven acquisition theories emphasize that firms may use equity as currency when their shares are highly valued, implying that stock-financed acquisitions can reflect misvaluation or timing incentives (Shleifer & Vishny, 2003). However, if the investor base is dominated by long-horizon institutional owners and monitoring is relatively strong, the scope for opportunistic timing may be more limited and the credibility of equity offers may be interpreted differently. In such a setting, observed payment choices may more plausibly reflect transaction design than pure market-timing incentives. This lens is particularly useful when interpreting short-run announcement reactions and when reconciling them with longer-run valuation and operating outcomes, as market-based measures can embed both fundamentals and changing valuation conditions.

Taken together, the Nordic institutional and ownership environment can shape the expected relationship between payment method and value creation through three main channels. A transparent information environment may weaken adverse selection signaling and alter the informational content of equity payment (Myers & Majluf, 1984; Travlos, 1987). Concentrated ownership and control considerations can make dilution costly and thereby induce selection into equity payment, while governance can discipline acquisition decisions (Nenova, 2003; Rydqvist, 1996; Faccio & Masulis, 2005; Jensen, 1986; Shleifer & Vishny, 1997). Finally, the investor base may condition market-timing interpretations of stock offers in specific contexts. (Shleifer & Vishny, 2003). These considerations motivate interpreting established payment-method theories as context-dependent and guide how the empirical evidence is discussed in the subsequent chapters. The relevant features of the Nordic landscape and their implications for the core theoretical frameworks of this thesis are summarized in Table 1.

Table 1. The Nordic features and their moderating capacity

The table summarizes the core characteristics of the Nordic financial markets and their implications regarding payment method decisions.

Transparency and disclosure	Lowers adverse-selection, limits valuation opacity and improves external discipline
Concentrated ownership	Lowers the need for signaling, makes timing less plausible and dilution more costly
Institutional investors	More sophisticated interpretations, constrains opportunistic timing and mitigates empire-building through monitoring
Cross-border orientation	Stronger signals through higher uncertainty, creates more integration risks and disperses valuations

2.4 Empirical evidence from prior studies

Empirical research on M&A has been at the centre of extensive developments over the past decades, yet consensus regarding value creation remains quite elusive. While target shareholders consistently experience positive abnormal returns at announcement, the evidence for acquiring firms is far more mixed, depending on market conditions and institutional environments (Andrade et al., 2001). This section provides a closer look at the empirical literature on M&A value creation with a focus on the method of payment, covering both short-term reactions and longer-term performance outcomes across various institutional contexts.

2.4.1 General Evidence on M&A Value Creation

The earliest empirical studies of M&A focused mainly on shareholder wealth effects measured around the announcement of a tender offer using event study methodology. These studies found that the target firms have a tendency of earning substantial positive abnormal returns, while acquirer returns were more ambiguous (Jensen & Ruback, 1983; Bradley et al., 1988; Andrade et al., 2001). Similar insights were provided by Moeller et al. (2004), whose documentation explained that large acquirers tend to destroy value on average, with smaller bidders performing better.

European evidence supports these conclusions with varying magnitudes. Campa and Hernando (2004) and Goergen and Renneboog (2004) show that European acquirers earn small but positive announcement-period returns and that cross-border deals tend to produce higher combined gains due to diversification and market integration effects.

Broadly, the empirical evidence on announcement-period wealth effects is remarkably consistent across larger samples: target shareholders capture sizable gains around takeover announcements, whereas bidder abnormal returns are, on average, close to zero and highly dependent on deal characteristics and the method of acquisition. At the same time, aggregate value creation at the deal level is often positive, implying that acquisitions can create total surplus even when bidder gains are not systematically large at announcement. Comprehensive reviews and classic event-study evidence highlight that this basic pattern is robust, while cross-sectional heterogeneity largely explains why bidder reactions vary widely across transactions (Bradley et al., 1988; Betton et al., 2008)

While event studies provide insights into market expectations, subsequent literature has also examined post-merger operating performance to test whether synergies materialize. Healy et al. (1992) report that U.S. acquirers experience improved operating cash flow returns following mergers, consistent with efficiency gains. Later studies have provided more mixed results (Ghosh, 2001; King et al., 2004), as many acquisitions seemingly fail to generate sustainable improvements in operations. Meta-analyses suggest that methodological heterogeneity and deal type explain the observed variations.

2.4.2 Payment method and Short-Term Reactions

A major branch of M&A research focuses on the method of payment as a determinant of market reaction. The study by Travlos (1987) finds that acquirers financing deals with stock experience lower abnormal announcement returns compared with cash-financed deals. This result is interpreted through the information asymmetry and signaling framework, as managers of overvalued firms prefer to use equity as currency. This can be seen as a negative signal about firm value (Myers & Majluf, 1984). Conversely, cash offers suggest confidence in valuation accuracy and result in positive reactions.

Subsequent research has both confirmed and expanded these findings. For example, Franks et al., (1988) demonstrate that the negative market reaction to stock offers persists across different periods and geographies. Faccio and Masulis (2005) extend this analysis to Europe, finding that payment method is influenced by ownership concentration, governance and financial conditions. Their results show that stock-financed deals generate significantly lower returns around announcement for

acquirers, especially when weaker investor protection is present. Goergen and Renneboog (2004) report that cash offers in Europe produce positive bidder abnormal returns, whereas stock offers have a more conflicting effect.

Recent studies have taken a more rigorous approach to their analysis by taking into account hybrid payments and deal-specific characteristics. Alexandridis et al. (2013) find that cash deals are associated with higher premiums but also higher rates of success, while mixed offers are connected to medium-level reactions. Fuller et al. (2002) suggest that the acquirer's size and reputation mitigate negative market perceptions in stock transactions.

Overall, there is strong empirical support on the role of payment method in serving as an informational signal on the short-term. This decision seems to shape how markets assess expected value creation at transaction announcement. The literature also suggests that the effects for deals paid in cash are more positive, with stock as currency facing more ambiguous reactions from the market on the short-term.

2.4.3 Long-Term Performance and Payment Method

Whereas the evidence on short-term performance has been extensively documented, long-term performance remains a more mixed subject. Early literature, such as Loughran and Vijh (1997), finds that acquirers using stock as a payment method are connected to underperformance over the three to five years following the transaction. On the contrary, cash acquirers seem to either maintain or even improve their market-adjusted performance. These findings can be interpreted as evidence of market mispricing and subsequent correction, which would be consistent with the idea of stock-financed deals occurring in instances of temporary overvaluation of the acquirer's shares.

However, this relationship has been questioned to some extent by subsequent research. Rau and Vermaelen (1998) argue that the apparent underperformance of acquirers is largely driven firms that can be considered as "growth" companies, with Sudarsanam and Mahate (2003) finding similar results. The studies found that so-called "value" companies tend to perform better, regardless of payment method. Gregory (1997) suggests that in the U.K. context long-term abnormal returns are typically significantly negative post-acquisition, especially for stock acquirers. These studies give solid insights on longer-term stock market reactions through analysis of abnormal returns.

As this thesis also intends, long-term value creation can be assessed through operating performance measures such as return on assets (ROA), return on invested capital (ROIC) and Tobin's Q. Healy et al. (1992) report improvements in post-acquisition performance particularly in transactions that were

motivated by efficiency gains and synergies. Later on, Linn and Switzer (2001) suggested that stock-financed acquisitions are more likely to endure post-deal declines in profitability and valuation multiples. This could be an indication of possible overpayment or challenges in post-deal integration.

One explanation for the variation in the observed long-term outcomes could be the endogeneity of payment choice. Firms that select stock financing may differ systematically from those that use cash. This is not only true in valuation terms but also in growth prospects, governance and managerial incentives. This problem has introduced the need for techniques such as propensity score matching, which allows researchers to compare transactions that are similar in observable characteristics except for the payment method (Yung, 2013). Studies that have employed this approach tend to find that the performance gap between cash and stock deals narrows significantly, suggesting that previously observed differences may have been driven by firm-specific factors rather than causal effects of payment method alone.

Despite these clear advancements in study methodology, there remains little evidence on whether any of these patterns hold in markets characterized by high investor protection, concentrated ownership and transparent financial reporting. These are all factors that are very prominent in the Nordic region. Extending this analysis to Nordic listed firms provides an opportunity to test the robustness of existing theories under distinct institutional conditions. The results may offer valuable insights into how market efficiency and corporate governance jointly shape the long-term success in mergers and acquisitions.

2.4.4 Cross-Country Evidence and the Nordic Context

A considerable body of research has demonstrated that the relationship between payment methods and value creation in mergers and acquisitions is not uniform across countries. Institutional, legal and ownership characteristics play a decisive role in shaping both financing choices and post-acquisition outcomes. Early cross-country analyses, such as La Porta et al. (1998), established that the degree of investor protection and legal enforcement significantly affects corporate financing behaviour and governance mechanisms. Markets with stronger protection and more developed financial systems tend to exhibit lower information asymmetry and agency conflicts, which in turn influence the cost and preference for using equity versus cash in acquisitions.

Faccio and Masulis (2005) examined European mergers and acquisitions and found that institutional differences across countries affected both payment method choice and value creation. In markets with high ownership concentration and strong investor rights, acquirers were less likely to use stock as

payment, as the dilution of control was more costly. Conversely, in markets with dispersed ownership and more liquid capital markets, stock payments were more common. These differences suggest that governance structures and ownership incentives are crucial determinants in understanding cross-country heterogeneity in M&A outcomes. Similarly, Goergen and Renneboog (2004) found that European acquirers, particularly those in civil law countries, tend to experience weaker short-term market reactions compared to their Anglo-American counterparts, reflecting differing market expectations regarding acquisition efficiency and governance practices.

By situating this research within the Nordic market, this thesis contributes to the broader literature by testing whether the well-established relationships between payment method and value creation, observed primarily in the U.S. and continental European settings, hold under a governance model that combines transparency, concentrated ownership and strong regulatory oversight. In doing so, the study aims to provide evidence on whether institutional quality moderates the effectiveness of financing decisions in creating shareholder value through M&A.

2.4.5 Methodological Developments and Endogeneity Considerations

Empirical research on mergers and acquisitions has evolved substantially over the past decades. Early studies, such as Travlos (1987) and Asquith et al. (1983), relied heavily on event study methodologies to measure short-term abnormal stock returns around the announcement of an acquisition. These studies provided foundational insights into market reactions and established a robust link between announcement effects and market expectations of value creation. However, their short-term focus and reliance on stock price data left open questions regarding long-term performance and causality between financing decisions and subsequent firm outcomes.

In response, later research expanded the methodological toolkit by incorporating accounting-based measures of post-acquisition performance. This shift enabled a more comprehensive understanding of whether acquisitions create sustainable value beyond the immediate market reaction. Yet, as several scholars have noted, long-term performance studies face challenges related to benchmark selection, survivorship bias and the difficulty of isolating acquisition effects from broader macroeconomic or firm-specific trends (Andrade et al., 2001).

Parallel to this development, researchers began to identify a critical empirical challenge: the endogeneity of payment method choice. Firms do not randomly choose between cash and stock. Rather, these decisions reflect internal characteristics such as leverage and growth opportunities. This

non-random selection introduces biases into performance comparisons, as firms predisposed to certain methods may also systematically differ in outcomes.

To address these concerns, scholars have incorporated more sophisticated econometric techniques. Yung (2013) utilized propensity score matching (PSM) to control for observable differences between stock- and cash-financed acquirers in the payment decision phase. Additionally, Golubov et al. (2016) employed PSM on a stock-acquisition sample and found the long-thought stock underperformance didn't stand after matching. These studies marked a methodological shift from simple comparative analyses toward quasi-experimental design that better isolates causal effects.

Beyond matching, panel-data frameworks have been increasingly adopted to control for unobservable firm heterogeneity. Moeller et al. (2004) analyzed thousands of global acquisitions using fixed-effects panel regressions to account for firm characteristics such as corporate culture. More recent empirical research also integrates panel regressions with matched samples to strengthen internal validity and ensure that observed performance effects are not driven by sample composition.

These methodological developments collectively showcase an ongoing effort in M&A research to move from correlation-based evidence toward stronger causal inference. The combination of event study analysis for short-term market reactions and longitudinal panel methods for long-term outcomes has become more common in recent literature. This evolution has significantly enhanced the credibility of empirical findings by addressing the endogeneity and selection biases that historically limited interpretability.

Building on these developments, the present study employs a triangulated empirical design that mirrors these best practices: an event study and a regression to capture short-term announcement effects, panel regression models to assess long-term value creation and propensity score matching to mitigate the endogenous selection of payment methods. In doing so, the study aligns with the current methodological frontier in corporate finance research and aims to extend it to the underexplored Nordic context.

2.4.6 Summary and Research Gap

Research on mergers and acquisitions has extensively examined how payment methods influence shareholder value. Early studies such as Travlos (1987) and Myers and Majluf (1984) linked payment choices to information asymmetry and signaling, suggesting that stock-financed deals may indicate overvaluation, while cash payments reflect stronger confidence and financial stability. Later studies, including Faccio and Masulis (2005), further connected these decisions to agency considerations and

governance environments, emphasizing that the determinants of payment choice are both financial and institutional.

Although short-term announcement effects are well documented, the evidence on longer-term value creation remains quite mixed. Some studies find that cash-financed acquisitions outperform stock deals in the years following the transaction (Loughran & Vijh, 1997; Moeller et al., 2004), whereas others find no plausible relationship once firm and deal characteristics are controlled for (Healy et al., 1992; King et al., 2004). These inconsistencies highlight the importance of context: institutional frameworks, ownership structures and governance quality may moderate the relationship between payment method and performance (Campa & Hernando, 2004).

Methodologically, the field has advanced toward more rigorous approaches that are better able to address endogeneity in payment choice. Studies employing propensity score matching (Yung 2013; Golubov et al., 2016) and panel regressions (Alexandridis et al., 2012) have provided more credible evidence by reducing sample selection bias and accounting for unobservable firm effects. However, this growing methodological sophistication has been applied mainly to large, data-rich markets such as the U.S., U.K., and China, leaving the Nordic region largely unexamined. The relevant prior studies and their broad results are documented in Table 2.

Table 2. Prior evidence on M&A performance.

This table summarizes key findings from the M&A literature, distinguishing between studies that analyze overall wealth or operating effects (not payment-method specific) and studies that explicitly compare outcomes by payment methods.

Evidence stream	Key studies	Market	Results
Baseline M&A wealth effects	Jensen & Ruback (1983); Bradley et al. (1988); Andrade et al. (2001).	US	Targets gain strongly, bidder gains mixed
Announcement reaction by payment method	Travlos (1987)	US	Stock acquirers underperform versus cash at announcement
Announcement reaction by payment method	Goergen & Renneboog (2004)	Europe	Cash offers elicit stronger positive reactions
Long-run performance	Loughran & Vijh (1997)	US	Stock often underperforms
Long-run operating performance	Healy et al. (1992); Ghosh (2001)	US	Mixed, performance sensitive to design

Despite extensive evidence on announcement-period effects and a large literature on post-acquisition performance, several gaps remain relevant for this thesis. First, much of the payment-method evidence is derived from settings where ownership is relatively dispersed and institutional environments differ from the Nordic context, even though institutional quality and ownership structures are likely to shape both payment choice and how markets interpret it. Second, the literature often treats short-run market reactions and longer-run operating or valuation outcomes in isolation, which makes it difficult to assess whether payment-method patterns at announcement reflect information effects, deal selection or the subsequent realization of synergies.

This thesis addresses the mentioned gaps by examining Nordic transactions through a unified framework that links payment method to outcomes across both horizons. By combining announcement-period reactions with longer-run performance measures in the same empirical setting, the study contributes to a more context-sensitive understanding of when and why cash- and stock-financed acquisitions differ in their observed value implications.

2.5 Hypotheses development

Payment method is an endogenous component of deal design that can affect both how acquisition announcements are interpreted and how post-deal outcomes unfold. The theories reviewed above imply that cash and stock consideration differ in their informational content, risk allocation and governance dynamics, leading to systematic differences in announcement-period reactions and potentially in longer-run outcomes. These mechanisms motivate the following three testable predictions.

The first hypothesis concerns the short-term announcement effects. According to signaling theory, managers of high-quality firms prefer to finance acquisitions with cash in order to credibly convey confidence in the value of the target and the synergies anticipated from the transaction (Myers & Majluf, 1984). In contrast, stock financing may signal overvaluation of the acquirer, as firms whose shares are perceived to be overpriced have incentives to use equity as transaction currency. Prior empirical studies consistently document more favourable announcement returns for cash-financed acquisitions in comparison to stock-financed ones (Travlos, 1987; Loughran & Vijh, 1997; Faccio & Masulis, 2005). Based on this, the first hypothesis concerns the immediate market reaction at the announcement of a transaction.

> **H1: Stock-financed acquisitions are associated with lower announcement-period abnormal returns for the acquirer than cash-financed acquisitions.**

On the longer horizon, market timing theory predicts that acquirers issuing equity around the time of an acquisition tend to be overvalued, leading to subsequent underperformance when valuations revert towards fundamentals. In contrast, firms using cash often have stronger internal resources and healthier balance sheets, potentially resulting in superior post-merger performance. Empirical studies from U.S. and European markets generally find that stock acquirers underperform cash acquirers in the years following the transaction, both in operating performance and market-based measures (Loughran & Vijh, 1997).

A further nuance is that the expected differences between acquisitions can be metric specific. Accounting-based operating measures are closely tied to realized integration outcomes and capital allocation discipline and therefore provide a direct window into whether acquisitions improved underlying performance. Market-based valuation measures reflect both expectations and discount rate/valuation dynamics and may therefore react differently if part of the initial payment-method effect is driven by valuation conditions that subsequently mean-revert. For this reason, hypotheses about long-run performance are most naturally anchored in operating outcomes, while valuation-based evidence should be interpreted as complementary information about market reassessment. More generally, the long-horizon literature cautions that inference based on long-run abnormal performance can be sensitive to methodology and benchmark choice, motivating careful interpretation of valuation-based results alongside accounting outcomes (Barber & Lyon, 1997; Mitchell & Strafford, 2000).

H2: Relative to stock-financed acquisitions, cash-financed acquisitions are expected to be associated with stronger long-run performance, particularly in operating outcomes.

The unique Nordic governance environment also acts as a point of interest in this study. As discussed earlier, it is characterised by concentrated ownership, strong investor protection and relatively transparent financial reporting. These factors reduce information asymmetry between managers and investors, potentially weakening the signaling power of the payment method. Further, disciplined capital markets and lower prevalence of managerial empire-building may attenuate the performance differences documented in U.S settings. Thus, while the direction of the expected effects remains consistent with global evidence, their magnitude might be mitigated in the Nordic context.

H3: In the Nordic institutional and ownership environment, differences between cash- and stock-financed acquisitions are expected to be attenuated, consistent with relatively high transparency and stronger governance constraints.

In the empirical analysis, H1 is assessed using announcement-period abnormal returns, whereas H2 is examined using longer-run operating and valuation-based measures. H3 is evaluated interpretatively by considering whether the observed patterns align with the institutional mechanisms discussed above.

Together, these hypotheses connect the theoretical foundations of payment method choice to empirically testable predictions, forming a coherent framework for the subsequent analysis of short-

term market reactions, long-term performance and the moderating role of Nordic institutional features.

3 Data and methodology

The empirical part of this thesis aims to investigate how the method of payment in mergers and acquisitions affects value creation for acquiring firms in the Nordic region. To achieve this objective, a combination of complementary quantitative methods is applied to capture both short-term and long-term effects. The empirical strategy builds on a carefully constructed dataset that combines transaction-level information with firm-level financial data from LSEG Workspace. These together provide necessary breadth and depth to assess how payment structure influences market reactions and post-acquisition performance across different time horizons.

3.1 Data description

This thesis uses a deal-level dataset that combines transaction characteristics with acquirer-level market and accounting information for Nordic listed entities. The core transaction universe is obtained from LSEG Workspace, which provides detailed coverage of M&A events, including announcement dates, method of payment and other key deal characteristics. Firm-level financial statement and market variables for the acquiring firms are drawn from the same source to ensure consistent identifiers and timing.

The empirical setting consists of completed acquisitions announced between 2000 and 2019, which makes it possible to study long-term effects across several distinct merger wave periods. The acquiring firm in the data is publicly listed and headquartered in Sweden, Finland, Denmark, Norway or Iceland. Targets can be public or private and transactions can be both domestic and cross-border. To ensure that the sample captures economically meaningful transactions and to reduce noise stemming from very small acquisitions, the deal dataset was restricted to transactions where the deal value is at least 10 million euros. Deal values are sourced from LSEG and are already converted to euro, ensuring a consistent FX basis across countries and removing the need for conversions.

Although the analysis is built on a single transaction universe, the effective samples differ slightly across the short-run and long-run analyses due to data availability constraints. The event study requires reliable daily return series for the acquirer around the announcement date and a sufficiently long return history to estimate normal performance (Brown & Warner, 1985; MacKinlay, 1997). The long-run performance analysis, in turn, requires the availability of post-acquisition accounting and market outcome measures over multiple years following the deal, which may not be observable for all transactions due to missing reporting periods, delistings or changes in coverage. Consequently, some deals included in the event study may not be usable in the long-run panel setting and vice versa.

This feature is typical in multi-horizon M&A designs and reflects differences in the underlying information requirements rather than arbitrary sampling.

The announcement-period analyses rely on daily stock return series for acquirers, sourced consistently from LSEG. The provider applies standard corporate-action adjustments, making the series directly comparable across countries. These daily returns are used to summarize market reactions around deal announcements. For the post-acquisition horizon, accounting- and market-based proxies are tracked to capture both realized operating efficiency and investors' reassessment over time.

In addition to the baseline long-run sample, the thesis constructs a propensity score matched sample for the long-horizon analysis to mitigate selection concerns arising from systematic differences between cash- and stock-financed acquirers. The matched sample is based on pre-announcement firm characteristics and is used as a complementary design in an attempt to solve the endogeneity concerns in causal M&A literature (Rosenbaum & Rubin, 1983; Shipman et al., 2017).

The dataset is structured at the deal level, implying that the same acquirer can appear multiple times if it completes multiple acquisitions within the sample period. This reflects the economic reality that active acquirers execute repeated transactions and ensures that the sample captures both occasional and serial acquirers rather than implicitly restricting attention to one-off events.

3.2 Methods

The empirical design is structured to evaluate how the method of payment in M&A relates to acquirer value creation in the Nordic region across different time horizons. Because acquisition outcomes are multidimensional and payment choice is not random, relying on a single empirical approach would risk an incomplete interpretation. The thesis therefore combines an event-study framework with long-run panel models and a propensity score matching design to improve comparability between cash- and stock-financed transactions. This unique design is visualized by Figure 2.

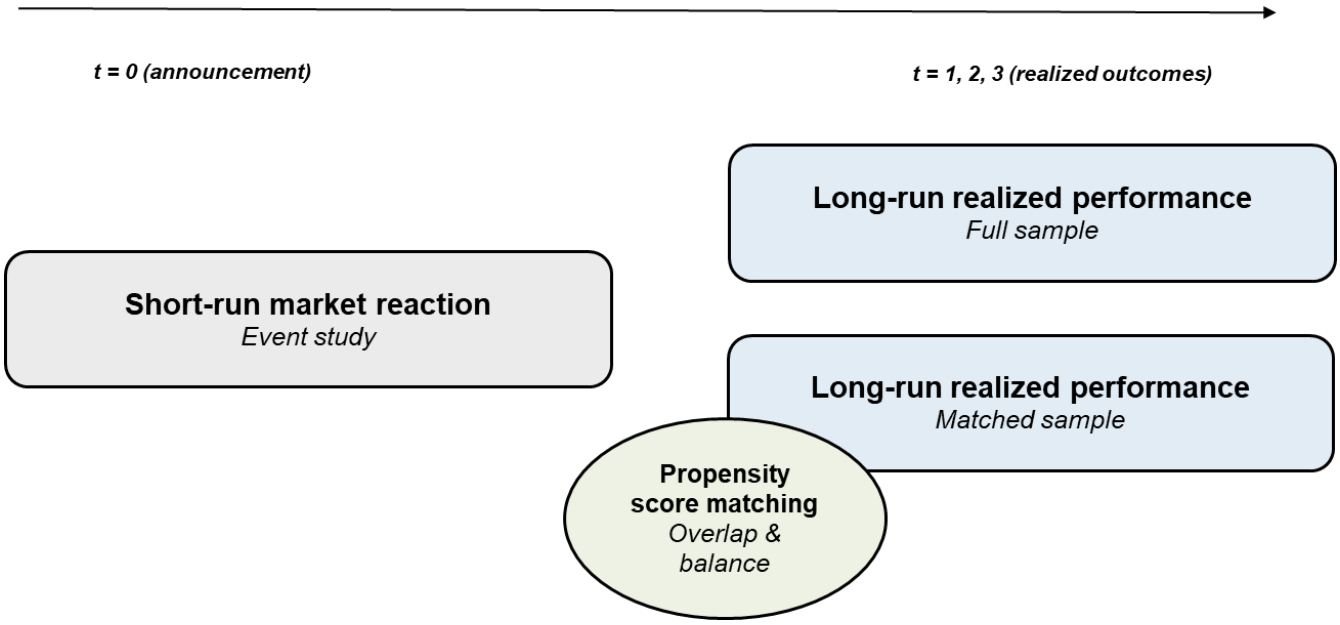

Figure 2. The three-fold methodological configuration.

The figure depicts how the chosen empirical methods fit within a timeline and conceptualizes the structure of the analysis, indicating how the event study, regressions and propensity score matching link together.

3.2.1 Event study methodology

The first part of the empirical analysis focuses on short-term market reactions to acquisition announcements using the well-established event study methodology (Brown & Warner, 1985; MacKinlay, 1997), which has served as the empirical backbone for previous literature. The core idea is that the stock market has a reaction to new information at the time of a certain event. In this case, the event is the announcement of an M&A transaction. Should the market be efficient, the abnormal return around the announcement window reflects the market's expectation of the net value creation from the acquisition.

There are several models to estimate the reaction of the stock markets to some new information, and in this thesis the chosen model is the market model **(**MacKinlay, 1997). This decision was made because the market model provides a parsimonious but economically meaningful benchmark that controls for time-varying market movements. In daily-return event studies, the market model typically improves the efficiency of abnormal-return estimates by reducing residual variance relative to simple mean-adjusted approaches, while keeping the estimation transparent and robust for short event windows. Given the multi-country Nordic setting and the emphasis on comparability, the market model offers a practical trade-off between model fit and data consistency, and it remains the dominant benchmark in modern M&A event study applications (Kothari & Warner, 2007).

Logarithmic returns are used in the event study due to their inherent statistical properties that make them more suitable for empirical analysis (Campbell et al., 1997). First, log returns are time-additive, meaning returns over multiple periods can be summed rather than compounded. This simplifies the calculation of cumulative abnormal returns and improves interpretability of event-window results (Cochrane, 2005). Second, log returns typically exhibit closer-to-normal statistical distributions, which aligns better with the assumptions behind common econometric methods used in event studies (MacKinlay, 1997; Strong, 1992). They are also scale-invariant and handle both large and small price changes consistently, reducing distortions that can arise with simple returns.

In this thesis, the normal return of each firm is estimated using an estimation window ranging from 180 to 10 trading days prior to the announcement date. This design follows the dominant methodology in event study research, where the estimation period must be sufficiently long to allow the coefficients to be estimated with statistical precision. It is also important that the estimation window is distant enough from the event so that the return-generating process is not influenced by information leakage or pre-announcement speculation. Prior literature emphasises that estimation windows of approximately 150 to 250 days strike an optimal balance between variance reduction and structural stability of the market model parameters, avoiding the noisy behaviour often observed in shorter series (Travlos, 1987; Andrade et al., 2001).

Ending the estimation window ten days before the announcement further reduces the risk that rumours, insider trading and anticipatory price movements contaminate the benchmark return. This separation between the baseline period and the event window is particularly important in M&A settings, where information diffusion is seldom instantaneous and markets frequently incorporate their expectations gradually. By adopting a -180 to -10 window consistent with mainstream empirical practice, the estimated counterfactual return series provides a statistically reliable and theoretically clean benchmark against which excess returns in the event window can be evaluated.

Having estimated each firm's normal-return relationship over the estimation window, the event-study analysis proceeds by comparing realized returns around the announcement to the returns that would be expected absent the event. The key object is the abnormal return, defined as the unexpected component of the realized return after controlling for general market movements. Under the market model, the expected return is given by the fitted value from the estimation-window regression. Abnormal returns are then computed as the residual between the realized return and this expected return, depicting the announcement reaction in terms of stock returns. The abnormal returns (AR) for firm i on day t are defined as:

$$AR_{it} = R_{it} - (\alpha_i + \beta_i R_{mt}),$$

where R_{it} is the actual return for firm i and R_{mt} is the return of the market index. The model also includes two parameters: α_i and β_i, with the first one representing the firms average abnormal performance when the market return is zero and the latter measuring the firms systematic risk. These parameters are estimated through ordinary least squares (OLS) regression during the estimation window.

The market return is proxied using broad, value-weighted all-share indices for each acquirer's home market in the Nordics. Concretely, bidder firms headquartered in Sweden, Finland, Denmark, Norway and Iceland are benchmarked against their respective domestic all-share indices: the OMX Stockholm All-Share Price Index, OMX Helsinki All-Share Price Index, OMX Copenhagen All-Share Price Index, Oslo Børs All-Share Index and OMX Iceland All-Share Price Index. Using domestic all-share benchmarks ensures that the market factor reflects the country-specific trading environment and sector composition relevant for each bidder and avoids relying on narrow large-cap indices that may poorly represent the marginal opportunity set of investors.

Using home-country all-share indices is consistent with the event-study literature, where normal returns are typically benchmarked against broad domestic indices to align the market factor with the institutional, regulatory and macroeconomic environment of each firm (Brown & Warner, 1985). In the Nordic context, this choice is particularly important because the composition and sectoral weights of the markets differ materially despite a high degree of regional integration. Matching each bidder to its national index reduces model misspecification that could arise from using a single regional benchmark and helps ensure that the estimated parameters reflect country-specific risk-return characteristics. As a result, the abnormal returns around the announcement window can be more confidently interpreted as the market's reaction to the acquisition rather than artefacts of an imperfect market proxy.

Event study methodology often isn't concerned with the reactions on just a single date, and such is the case in this study as well. For the analysis to capture returns across several different days, cumulative abnormal returns (CAR) must be calculated across a specific event window. In this thesis, the primary event window is defined as -1 to +1 trading days around the announcement date. This window captures the immediate market reaction to the acquisition news and is widely used in the M&A literature examining announcement effects of payment methods (Travlos, 1987; Andrade et al., 2001; Moeller et al., 2004). A narrow window limits the influence of confounding events unrelated to the transaction and isolates the price impact of new information revealed at the announcement.

However, acquisition announcements often involve leaked information, speculation or negotiation rumours, which can cause abnormal returns to begin accumulating before the actual announcement of the transaction (Betton et al., 2008). Likewise, market reactions may take more than one trading day to fully materialize, especially if they come with any added complexities. For this reason, the baseline window is complemented with alternate windows, such as -2 to +2 and -5 to +5, to examine the robustness of the result. Figure 3 depicts the complete event study timeline.

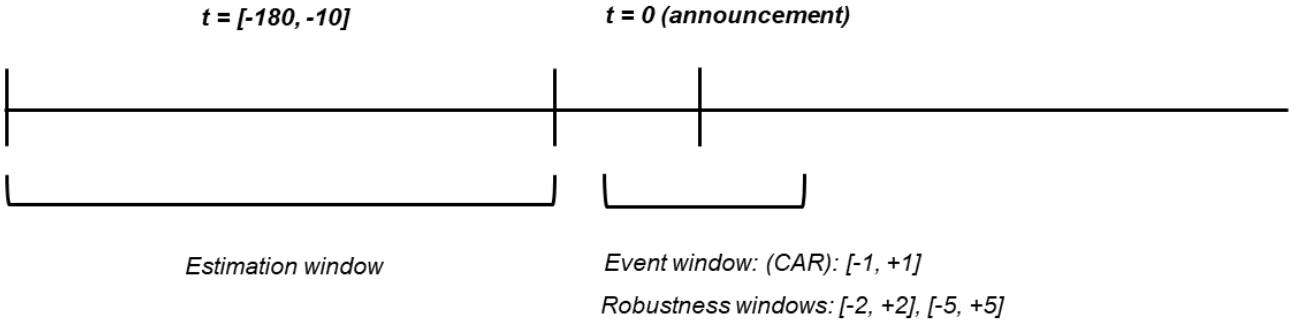

Figure 3. The event study timeline

The figure showcases how both the estimation window and the event windows relate to the announcement.

Comparison of the results across multiple different windows helps determine whether the observations are concentrated around the immediate release of the acquisition announcement or part of a broader market adjustment process. If results are consistent across windows, confidence in the validity of the findings increases. In summary, using both a primary short window and secondary robustness windows aligns with established empirical practice and allows for a more nuanced interpretation of how the market processes acquisition announcements and the chosen payment method.

CARs can be calculated as:

$$CAR_i = \sum_{t=T_1}^{T_2} AR_{it}$$

For a given window w, the cross-sectional average is then defined as:

$$CAAR_W = \frac{1}{N} \sum_{i=1}^{N} CAR_{i,W},$$

which is the primary reported statistic in the results section.

To assess statistical significance, the analysis relies on complementary inference approaches that are standard in modern event-study practice. First, within each payment method subsample, mean cumulative abnormal returns are evaluated against zero using a one-sample t-test. While parametric tests are widely used in daily-return event studies and perform well in many settings, M&A announcement returns can exhibit non-normality and event-induced heteroskedasticity. For this reason, the thesis also reports non-parametric evidence that does not rely on normality assumptions (Brown & Warner, 1985; Corrado, 1989; MacKinlay, 1997).

For the parametric benchmark, inference on cumulative average abnormal returns relies on the standard cross-sectional t-test used in short-horizon event studies. Let CAR_i denote firm i's cumulative abnormal return in the chosen event window and n the number of observations. The test statistic is:

$$t_{CAAR} = \frac{CAAR_{t_1,t_2}}{\sqrt{\sigma_{CAAR_{t_1,t_2}}}},$$

where the denominator is the estimated variance of the sample mean as follows:

$$\sigma_{CAAR_{t_1,t_2}} = \frac{1}{n(n-1)} \sum_{i=1}^{n} (CAR_i - \overline{CAR})^2.$$

Additionally, because the core research question is inherently comparative, the analysis directly tests whether average CARs differ between cash- and stock-financed deals in each event window. This difference is first assessed using a two-sample t-test for equality of means. As an additional robustness check, a Wilcoxon rank-sum test is reported, which is less sensitive to outliers and distributional assumptions than mean-based testing. The test statistics of both of these tests are outlined in Appendix 1. This combination provides a transparent benchmark while also guarding against conclusions driven solely by parametric assumptions (Corrado, 1989; Kothari & Warner, 2007).

To strengthen robustness further in a setting with an imbalanced number of cash and stock deals, the thesis supplements the above tests with a permutation-based randomization test for the cash-stock CAAR difference. The logic is to approximate the null distribution of the difference in mean CARs by repeatedly reassigning the payment method label across deals while keeping the original group sizes fixed and recomputing the difference in each iteration. The empirical p-value is then obtained as the share of permutations generating a difference at least as extreme as the observed one. The test statistic of the permutation-based test is also outlined in Appendix 1. Permutation tests are attractive

here because they are non-parametric by construction and can be more reliable than asymptotic approximations when return distributions are heavy-tailed (Kothari & Warner, 2007).

In addition to group-level CAAR comparisons, the thesis implements a multivariate event-study design in which announcement-period CARs are analysed in cross-sectional regressions. The motivation is that raw CAAR differences do not account for systematic differences in observable deal or acquirer characteristics that may correlate with both payment choice and announcement returns. Cross-sectional CAR regressions therefore serve as a complementary diagnostic: should the estimated cash-stock wedge remain similar after parsimonious covariate adjustment, confidence increases that the event study evidence is not purely driven by sample composition (Binder, 1998; Kothari & Warner, 2007). This structure moves the short-term analysis from plain observations towards more explanatory results.

For each of the three different windows around the announcement, the baseline regression can be specified as follows:

$$CAR_{i,W} = \alpha + \beta Cash_i + \gamma' X_{i,t-1} + \delta_{y(i)} + \theta_{c(i)} + \varepsilon_{i,W},$$

where $CAR_{i,W}$ is the deal-level cumulative abnormal return for acquirer i over window W, $Cash_i$ equals one for cash-financed acquisitions and zero for stock-financed acquisitions, and $X_{i,t-1}$ is a vector of pre-deal covariates measured in the fiscal year preceding the announcement. The model further includes deal-year fixed effects $\delta_{y(i)}$ and country fixed effects $\theta_{c(i)}$ to absorb time-specific shocks and persistent cross-country differences in market structure and institutional environment that could affect announcement reactions. Standard errors are clustered at the acquirer level to account for within-firm dependence induced by repeated acquisition activity over the sample period, which is a common concern in corporate finance applications using deal-level panels (Petersen, 2009).

The pre-deal covariate vector includes standard acquirer characteristics that are commonly and inherently linked to both financing choices and acquisition outcomes, thereby aligning with both prior M&A evidence and the varying theoretical channels discussed in the previous sections. These characteristics, their explanations and rationales for their usage in this three-step empirical framework are provided in Table 3. These same covariates are also utilized in the long-term regressions and the propensity score matching methodology as the pre-announcement characteristics utilized to create the matched subsample.

Table 3. The control variables used throughout the thesis

Key control variables, their applied definitions and rationales for their selection in the context of payment methods in acquisitions. These are used in both the short- and long-run regressions as well as in the PSM setup.

Variable	Definition	Rationale
Size	ln(Total assets)	Captures scale and acquisition capacity
Leverage	Total debt / Total assets	Financing constraints and risk
Liquidity	Cash & Equivalents / Total assets	Cash availability for acquisition
Profitability	Operating income / Total assets	Prior operating performance
Valuation	Market-to-book	Misvaluation and market timing

Finally, as internal consistency check across event windows, the thesis also estimates a pooled specification that stacks the CAR observations from the alternative windows and includes window indicators and interactions. The model is specified and in Appendix 2.

This pooled model provides a compact test of whether the estimated cash-stock wedge is stable across windows or concentrated in a specific horizon. Importantly, these regressions are interpreted as conditional associations and robustness diagnostics rather than as fully causal estimates, because payment method remains an endogenous managerial choice that might correlate with several unobserved deal characteristics.

3.2.2 Long-term performance

While short-term event studies capture immediate market reactions to acquisition announcements, they do not necessarily reflect realized post-acquisition performance. Announcement-period abnormal returns primarily measure investors' expectations and perceptions at the time of the transaction, which may be influenced by temporary sentiment or information asymmetries. To assess whether mergers and acquisitions generate sustained value creation, it is therefore essential to complement short-term reactions with long-term performance measures that capture realized operating outcomes and longer-horizon valuation effects (Healy et al., 1992).

Consistent with this literature, the present study employs a combination of accounting-based and market-based performance measures to evaluate post-acquisition value creation. Specifically, long-term performance is assessed using Return on Assets (ROA), Return on Invested Capital (ROIC) and Tobin's Q. Together, these measures provide a multidimensional view of post-acquisition performance that captures operational efficiency, capital allocation effectiveness and market valuation.

Accounting-based measures are widely used in M&A literature to evaluate post-acquisition operating performance because they reflect realized outcomes rather than market expectations. ROA is a standard indicator of operational efficiency, measuring the firm's ability to generate profits relative to its total asset base. It captures whether acquisitions lead to improvements in asset utilization, cost efficiency or profitability through synergies, restructuring or economies of scale (Healy et al., 1992; Ghosh, 2001).

$$ROA = \frac{Operating\ income}{Total\ assets}$$

ROIC extends this perspective by focusing explicitly on the returns generated on capital invested in the firm, net of taxes. By relating net operating profit after tax to invested capital, ROIC provides a closer approximation of economic profitability and allows for a more direct comparison with the firm's cost of capital. This makes ROIC particularly well suited for assessing whether acquisitions create value beyond merely expanding the asset base (Koeller et al., 2020; Damodaran, 2012).

$$ROIC = \frac{Net\ operating\ profit\ after\ tax}{Average\ Invested\ Capital}$$

The combined use of ROA and ROIC mitigates some of the limitations inherent in each measure individually. While ROA may be distorted by differences in asset intensity or accounting treatment, ROIC focuses more narrowly on capital employed in operations. Together, they offer complementary insights into post-acquisition operating performance and capital efficiency.

In turn, Tobin's Q represents a market-based indicator of the firm's valuation relative to its asset replacement cost and thus reflects investors' expectations of future profitability (Servaes, 1991; Lang et al., 1989). It is defined as the ratio of the market value of a firm's assets to their replacement cost. In empirical applications, the replacement cost of assets is not directly observable and is therefore proxied by the book value of total assets, which is a standard approximation in the literature (Chung & Pruitt, 1994; Perfect & Wiles, 1994).

Unlike accounting-based metrics, Tobin's Q incorporates forward-looking market assessments and captures value effects that may not yet be reflected in realized earnings or cash flows. This is particularly important in acquisitions where value creation is expected to materialize through long-term strategic repositioning, intangible asset accumulation or innovation rather than immediate improvements in profitability. By combining Tobin's Q with ROA and ROIC, the analysis bridges realized operating performance with market perceptions of long-term value creation.

$$Tobin's\ Q = \frac{Market\ value\ of\ assets}{Replacement\ cost\ of\ assets}$$

Despite their widespread use, long-term performance measures are subject to several well-known critiques. Accounting-based measures such as ROA and ROIC may be affected by accounting discretion, changes in depreciation policies, goodwill amortization or acquisition-related write-offs, potentially biasing post-acquisition comparisons. Moreover, improvements in accounting performance may reflect industry-wide trends or macroeconomic conditions rather than acquisition-specific effects.

Market-based measures such as Tobin's Q face different challenges. The metric is sensitive to stock market fluctuations, investor sentiment and broader macro-financial conditions that may be unrelated to acquisition performance. Additionally, measurement error arises because replacement cost of assets is typically approximated using book values, which may not accurately reflect economic reality, particularly for firms with substantial intangible assets (Perfect & Wiles, 1994).

Importantly, none of these measures alone provides a definitive assessment of value creation. Accounting measures may lag economic reality, while market-based measures may overreact or reflect factors beyond managerial control. Recognizing these limitations, prior literature emphasizes the importance of using multiple performance indicators to obtain a more robust assessment of post-acquisition outcomes (Megginson et al., 2004).

In summary, the combined use of ROA, ROIC and Tobin's Q provides a comprehensive and theoretically grounded framework for evaluating long-term value creation in mergers and acquisitions. Accounting-based measures capture realized improvements in efficiency and capital allocation, while Tobin's Q reflects market-based assessments of future profitability and growth. Although each measure has limitations, their joint use mitigates individual weaknesses and enhances the robustness of the long-term analysis. This multidimensional approach aligns with best practice in

the empirical M&A literature and allows for a nuanced assessment of whether short-term market reactions translate into sustained value creation.

In addition to these dependent variables, the long-run regressions incorporate a parsimonious set of pre-deal acquirer controls measured in the fiscal year preceding the transaction. The control vector includes standard bidder characteristics linked to both payment choice and post-deal outcomes, which are presented in Table 3**.** Importantly, same pre-deal covariate set is also used as inputs in the propensity score model to ensure consistency between the matching design and the outcome specifications.

Long-run performance is analysed at the deal level by relating post-acquisition outcomes to the payment method while conditioning on pre-deal bidder characteristics and time fixed effects. For each horizon, the baseline specification is:

$$Y_{i,h} = \alpha + \beta Cash_i + \gamma' X_{i,t-1} + \delta_{y(i)} + \varepsilon_{i,h},$$

where $Y_{i,h}$ represents ROA, ROIC or Tobin's Q for the firm i at a time t, h denotes the post-acquisition horizon for the first, second and third fiscal years after deal completion, $Cash_i$ equals 1 for cash-financed deals and 0 for stock-financed deals and $X_{i,t-1}$ is the vector of pre-deal controls measured in the fiscal year preceding the transaction. $\delta_{y(i)}$ notates deal-year fixed effects in this specification as well.

The timing of performance analysis is a critical methodological choice in long-term M&A analysis. Prior studies adopt horizons ranging from one to five years following the acquisition, reflecting the gradual nature of post-merger integration and synergy realization (Healy et al., 1992; Gugler et al., 2003). Short horizons may fail to capture delayed benefits, while very long horizons increase the risk that performance is driven by unrelated strategic decisions or external shocks.

In the long-term performance analysis of this thesis, firm outcomes are evaluated over a period of three years following the acquisition completion year. This window is chosen in line with prior studies (Loughran & Vijh, 1997; Agrawal et al., 1992), as it provides sufficient time for post-merger integration and synergy realization while minimizing the confounding effects of unrelated corporate events. Performance in year 0 refers to the fiscal year of the transaction, and subsequent years are included to assess the persistence and evaluation of post-acquisition value creation.

To evaluate post-acquisition outcomes beyond announcement effects, the thesis estimates long-run performance models using two complementary samples: the full acquisition sample and a propensity-

score-matched subsample constructed to improve comparability between cash- and stock-financed deals. Estimating the long-run specifications first in the raw sample provides a transparent benchmark for the conditional association between payment method and subsequent performance when controlling for observable covariates and time fixed effects.

However, method of payment choices in M&A are not random, and cash and stock deals can differ systematically in ways that are plausibly correlated with post-deal outcomes. For this reason, the empirical strategy subsequently re-estimates the same long-run outcome models in a matched sample that explicitly targets the region of common support where cash and stock transactions are observably similar. Conceptually, matching is used as a design step that reduces model dependence and sensitivity to functional-form assumptions in the subsequent regression stage, while the regression adjustment serves to account for any residual imbalance and to improve precision (Ho et al., 2007; Abadie & Imbens, 2011).

3.2.3 Propensity score matching

The phenomenon of payment method and value creation includes a clear problem of endogeneity. The main concern is the fact that firms do not randomly choose between cash or stock financing. Instead, the decision is systematically related to firm-specific characteristics such as profitability, leverage, size, growth opportunities and market valuation (Faccio & Masulis, 2005). This non-random selection can heavily bias the estimated relationship between type and value creation if not appropriately addressed. In other words, the attempted causality analysis is disrupted by the fact that firms have inherent differences that might carry over to post-acquisition value creation.

To mitigate this issue, a technique called propensity score matching (PSM) is employed in this study. It was originally developed by Rosenbaum and Rubin (1983), and it provides a quasi-experimental design for observational data by matching firms with similar characteristics but different payment methods. The core idea is that if two firms have comparable pre-acquisition profiles, differences in post-treatment outcomes can be more credibly attributed to the payment method itself rather than to pre-existing differences (Caliendo & Kopeinig, 2008).

A crucial aspect of the propensity score matching design is the selection of pre-acquisition firm characteristics used in the estimation of the propensity score. All matching variables are measured in the fiscal year preceding the acquisition to ensure that they are not affected by the transaction itself and reflect the information set available at the time of the payment method decision.

The matching covariates, depicted in Table 3, include firm size, leverage, profitability, liquidity, and firm valuation. These variables are widely used in the M&A literature and have been shown to systematically influence both the choice of payment method and post-acquisition performance (Faccio & Masulis, 2005; Shleifer & Vishny, 2003; Harford, 1999).

Importantly, the selection of pre-acquisition matching variables is grounded in the theoretical frameworks discussed earlier in this thesis. The choice of payment method is not arbitrary but reflects underlying differences in firms' information environments, financial constraints, agency considerations and governance structures. Consequently, the propensity score model incorporates firm characteristics that proxy for these theoretical mechanisms.

Variables such as firm size, valuation and profitability capture differences in information asymmetry and market timing incentives, as predicted by signaling and pecking order theories (Myers & Majluf, 1984; Travlos, 1987). Leverage and liquidity measures reflect financing constraints and balance sheet capacity, which influence firms' ability to finance acquisitions with cash rather than equity. Cash holdings and profitability also relate to agency considerations, as firms with substantial free cash flow may be more prone to value-destroying acquisitions if managerial incentives are misaligned (Jensen, 1986; Harford, 1999).

By matching acquirers with similar pre-deal characteristics across these dimensions, the propensity score matching procedure aims to construct a counterfactual setting in which cash- and stock-financed acquirers are comparable in terms of their ex-ante incentives and constraints. This approach strengthens the causal interpretation of subsequent performance differences by ensuring that observed post-acquisition outcomes are less likely to be driven by pre-existing firm heterogeneity rather than the method of payment itself.

The implementation of this technique proceeds in three main stages. First, each deal's likelihood of being cash-financed conditional on pre-deal bidder characteristics is estimated. This propensity score is modelled using a logit specification, where covariates are measured in the fiscal year preceding the transaction and defined in Table 3. The specification is as follows:

$$\log\left(\frac{p(X_i)}{1-p(X_i)}\right) = \alpha + \kappa' X_{i,t-1} + \delta_{y(i)} + \theta_{c(i)},$$

where $p(X_i)$ denotes the propensity score implicating the conditional probability that acquisition i is cash-financed given the pre-deal covariate vector $X_{i,t-1}$. In the model, α is the intercept of the logit

model, κ' is the associated coefficient vector, $\delta_{y(i)}$ denotes deal-year fixed effects and $\theta_{c(i)}$ represents country fixed effects.

After this, each cash-financed acquisition is matched to a stock-financed acquisition with a similar propensity score using a nearest-neighbour matching algorithm with replacement and a caliper restriction to ensure close comparability. Observations without a suitable match are discarded, producing a balanced dataset of cash and stock acquirers. The quality of the matching is verified using balance diagnostics, which test whether the matched sample eliminates statistically significant differences in the covariance between the two groups.

The balance diagnostics used help establish models with more internal validity. The credibility of propensity score matching depends on whether the implemented design achieves adequate overlap in the propensity score distributions between treated and control observations and improved balance in observed baseline covariates. Accordingly, match quality is evaluated using complementary diagnostics. First, overlap is assessed by inspecting the propensity score distributions before and after matching and by documenting the extent of unmatched observations (Rosenbaum & Rubin, 1983; Caliendo & Kopeinig, 2008).

The covariate balance is also evaluated using SMDs (standardized mean differences) rather than significance tests, as SMDs provide a scale-free measure of imbalance that is not mechanically driven by sample size. As a practical benchmark, post-matching SMDs close to zero and typically below 0.1 are interpreted as indicating acceptable balance. Finally, balance changes across the full covariate set are summarized visually using a Love plot (Stuart, 2010).

Finally, the matched sample is used as the basis for the subsequent panel regression analysis, which examines the long-term performance implications of payment method choices. In this setting, PSM acts as a pre-processing step that minimizes selection bias at the sample construction stage, while the regression framework controls for time-varying and unobservable heterogeneity. This two-step approach in which matching is followed by a regression enhances both the internal validity and causal interpretability of the results (Stuart, 2010).

3.3 Data and methodological limitations

Despite the careful design of this study, several limitations must be acknowledged regarding both data availability and identification. These limitations are important for interpreting the estimates and

for defining the scope of inference, as the results are most naturally read as robust associations across complementary designs rather than as definitive causal effects.

The empirical analysis is based on secondary data obtained from LSEG Workspace. While such databases are widely used in M&A research, reliance on publicly available reporting implies that coverage and variable definitions may vary across firms and over time, creating potential measurement noise and missing values in both deal characteristics and post-deal outcomes.

The study focuses on listed acquirers headquartered in Sweden, Denmark, Finland, Norway and Iceland. This improves data reliability and comparability but limits generalizability to private transactions and to settings where ownership, disclosure and financing conditions have distinct differences from Nordic listed markets. Also, cross-country and firm-level reporting heterogeneity can affect accounting variables and classification quality. Although LSEG harmonizes financial statement items, inconsistencies in payment method classification and missing post-deal accounting years can introduce measurement error and reduce the effective long-run sample.

Additionally, each of the three empirical back pillars of this thesis have some inherent weaknesses. Event study methodology has a built-in assumption that stock markets are informationally efficient, such that abnormal returns fully reflect investors' expectations of value creation at the time of the announcement (Brown & Warner, 1985; MacKinlay, 1997). Markets may underreact or overreact to new information, particularly in smaller markets such as the Nordics where liquidity is lower. Moreover, other concurrent events or macroeconomic news could contaminate the event window, making it difficult to attribute observed abnormal returns exclusively to the M&A announcement (Corrado, 1989).

The long-run outcome regressions provide a structured way to relate payment choice to realized post-deal performance, but they remain vulnerable to unobserved heterogeneity and endogeneity. Even with extensive pre-deal controls, factors influencing both payment method and performance may remain unobserved and bias the estimates. Moreover, acquisition accounting can mechanically affect operating ratios through purchase price allocation, goodwill recognition and restructuring charges, which can complicate cross-firm comparability in post-deal accounting outcomes.

Propensity score matching addresses the selection bias inherent in payment method choice by balancing observable characteristics between cash and stock acquirers (Rosenbaum & Rubin, 1983; Caliendo & Kopeinig, 2008). However, its ability to correct for endogeneity is limited to the same

observed covariates. Hidden bias arising from unobservable factors, such as managerial optimism, internal governance quality or deal-specific synergies may persist even after matching (Stuart, 2010).

PSM also comes with its own inherent methodological problems. Recent literature, including the influential critique by King and Nielsen (2019), has highlighted several limitations of propensity score matching that are directly relevant for this study and are therefore addressed. Although PSM is very useful for improving comparability between treatment and control groups, it may also introduce bias and distort conclusions if applied without criticism.

First, PSM prioritises similarity in the estimated propensity score rather than in the underlying covariates. If the propensity score model is even slightly misspecified, matching may pair observations that have similar predicted probabilities but differ substantially in firm characteristics. This may create an artificially constructed matched sample that does not represent the true economic population. Given that stock-financed deals are relatively rare and heterogeneous in the Nordic markets, this risk is especially salient for this study.

On a second note, PSM often leads to substantial loss of observations. Deals without close matches on the propensity score are discarded, which is an intended feature of the method but nonetheless reduces statistical power and may limit external validity. In the context of this dataset, where stock deals form a smaller minority, the reduction in sample size can be material. For this reason, all results from the matched sample are complemented with analyses on the full, unmatched dataset as a robustness exercise.

Also, omitted confounders, inappropriate functional forms or measurement noise in covariates can all distort propensity score estimates and lead to biased matches. The risk of model dependence is mitigated here by grounding all covariates in established theory, measuring them strictly before the acquisition and reporting standardized mean differences (SMDs) before and after matching.

Given these constraints the findings of this thesis should be interpreted as conditional on the chosen time frame, region and firm type. The results provide insights into the behaviour of listed Nordic acquirers operating in relatively transparent, investor-protective institutional settings. Extending the conclusions to emerging markets, private transactions or alternative governance systems should therefore be done with some caution.

Nevertheless, the triangulation of multiple empirical techniques substantially enhances internal validity and mitigates many of these biases typical in single-method designs. By explicitly acknowledging its limitations, this study strengthens its credibility and contributes to a more nuanced

understanding of how payment methods affect value creation in the unique Nordic institutional context.

4 Empirical analysis

4.1 Descriptive statistics

The empirical results are presented across two complementary horizons. Short-run announcement effects capture market expectations at the deal announcement, whereas long-run outcomes reflect realized post-acquisition performance in the subsequent fiscal years. Importantly, the samples used in these analyses are closely related but not identical. The event-study sample is defined by return data availability around the announcement, while the long-run sample additionally requires post-deal accounting and valuation information. Unless stated otherwise, the descriptive statistics reported in this section refer to the long-run sample, which forms the basis for the main outcome analysis. This distinction does not create major discrepancies, as the samples differ only marginally.

4.1.1 Sample composition

The final sample consists of 1050 acquisitions, of which 883 are cash-financed and 167 are stock-financed. A few time periods, such as the three years leading up to the global financial crisis in 2008, exhibit significantly higher amounts of transactions. This distribution is consistent with the presence of merger waves, where intensity clusters in certain periods rather than evolving smoothly over time. M&A activity co-moves with broader financing conditions, equity market valuations and corporate investment cycles. The increasing prevalence of cash financing is consistent with improved access to debt and abundant liquidity over parts of the same period, which can reduce the relative need to use equity as transaction currency.

The sample is dominated by acquirers from Sweden, followed by Finland, Norway and Denmark with Iceland clearly generating the least corporate transactions. Country-level composition mirrors the relative size of Nordic equity markets and the concentration of large and listed acquirers in different countries.

The distribution of payment methods is clearly unbalanced: cash-financed deals constitute the majority of transactions, while stock-financed acquisitions form a smaller share of the sample. This asymmetry is typical in listed-market M&A data and implies that comparisons involving stock-financed deals rely on a more limited set of observations. This should be kept in mind while interpreting precision and the matched-sample design. Table 4 summarizes the key characteristics of the core sample geographically and Figure 4 reflects on the distribution across time whilst also covering the portions of each payment type.

Table 4. The geographical distribution of the sample.

This table showcases the proportional composition of the sample by nation accompanied with each country's payment method distributions.

Country	Total N	Cash portion	Stock portion
Sweden	544	87%	13%
Finland	185	78%	22%
Denmark	122	84%	16%
Norway	170	82%	18%
Iceland	29	69%	31%

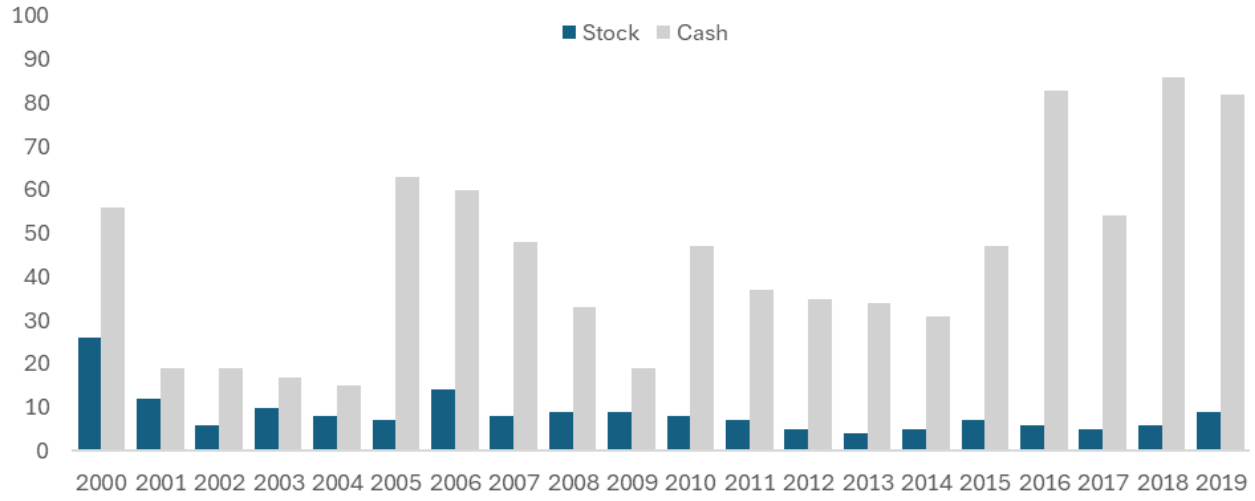

Figure 4. The distribution of the transactions across the sample period of 2000-2019.

A year-by-year composition by the deal announcement year and payment method. The figure also showcases the phenomenon of merger waves, with transaction activity clearly clustering in certain distinct time periods rather than being distributed evenly.

Consistent with market-wide valuation cycles, periods with elevated equity valuations tend to feature a higher incidence of stock-financed deals, as bidders with higher market-to-book ratios are more likely to use shares as acquisition currency (Baker & Wurgler, 2002; Shleifer & Vishny, 2003).

4.1.2 Acquirer characteristics

Acquirer characteristics are measured in the fiscal year preceding the acquisition to avoid mechanical post-deal effects and to ensure that the comparison reflects ex ante differences between bidders. In addition to just explaining the sample, these covariates are selected to capture both operating capacity and capital structure as well as market-based expectations that may influence acquisition behaviour and financing constraints. They provide transparency and a clear benchmark for assessing

comparability across payment methods, especially in the subsequent matched-sample analysis. The variables reported in Table 5 correspond to the core set of pre-deal covariates used throughout the thesis.

Table 5. The key pre-deal acquirer characteristics in the sample.

The pre-deal covariate values divided by payment type. First values depict means, whereas median values are in parenthesis. Size is the natural logarithm of total assets and profitability should be interpreted as a percentage value. Diff reports the difference in means and medians between cash-financed and stock-financed acquirers (Cash – Stock) for each pre-deal variable.

Variable	All	Cash	Stock	Diff
Size	22.192	20.766	22.468	-1.702
	(22.290)	(20.483)	(22.632)	(-2.150)
Leverage	0.254	0.260	0.222	0.039
	(0.234)	(0.244)	(0.164)	(0.081)
Liquidity	0.092	0.092	0.122	-0.030
	(0.058)	(0.055)	(0.068)	(-0.013)
Profitability	4.053	5.725	1.240	4.485
	(5.214)	(5.433)	(3.264)	(2.170)
Valuation	4.067	3.089	9.131	-6.042
	(1.820)	(1.778)	(2.128)	(-0.350)

The reported descriptive statistics for the main acquirer characteristics indicate that acquirers in cash- and stock-financed acquisitions differ systematically in bidder characteristics already prior to the transaction. Cash acquirers are smaller on average, but they exhibit higher leverage and slightly lower liquidity than stock-financed bidders. Profitability is also markedly higher among cash bidders, indicating stronger pre-deal operating performance. In contrast, stock-financed acquirers appear substantially more highly valued on average. However, the smaller difference in medians suggests that valuation measures are skewed and influenced by outliers.

Overall, these baseline differences highlight that the method of payment is associated with non-trivial selection on observables, motivating the need to condition on pre-deal covariates and to assess robustness using matched-sample comparisons.

4.1.3 Deal characteristics

Deal size is a central deal-level characteristic, as transaction values in listed-market M&A are typically highly right-skewed: a small number of very large transactions can substantially affect averages, while medians better reflect a typical transaction. In the present sample, the mean deal value is 251 million euros, with cash deals being lower on average at 225 million euros than stock deals at 385 million euros. The median values showcase the intense right-skewness of the dataset, with the median deal amounting to only 55 million euros, 51 million for cash and 67 million for stock.

Cross-border transactions dominate the sample, as 84% of acquisitions involve a target that is domiciled in a different country. This high share underscores that the setting is fundamentally international rather than domestic, which is important for interpreting both announcement effects and realized post-deal performance. Cross-border deals typically entail greater informational frictions and integration challenges, which can range from differences in accounting regimes and disclosure practices to institutional and cultural distance. These can affect both the perceived risk profile at announcement and the realization of synergies. The prevalence of cross-border activity aligns with the institutional dimension emphasized in the Nordic context.

Taken together, all of the descriptive statistics reveal substantial and systematic differences between cash- and stock-financed acquisitions in the Nordic markets. These differences span firm size, leverage, valuation and deal characteristics, indicating that the choice of payment method is strongly non-random.

Importantly, these findings do not imply that payment method causes differences in performance outcomes. Rather, they highlight the presence of selection effects that may bias simple comparisons of announcement returns or post-acquisition performance. This motivates the use of multivariate panel regressions and propensity score matching in the subsequent sections to isolate the relationship between payment method and value creation more credibly.

4.2 Short-term reactions

4.2.1 Announcement returns in the full sample

The event-study evidence indicates that, when all acquisitions are pooled, Nordic acquirers experience positive announcement-period abnormal returns across the considered windows. Using the market-model benchmark described previously, the implied pooled cumulative average abnormal return is approximately +2.3% in the baseline [-1, +1] window and remains of comparable magnitude

in the broader [-2, +2] and [-5, +5] windows. Economically, this suggests that acquisition announcements in the Nordic listed-acquirer sample are, on average, associated with a favourable reassessment of bidder value rather than a muted or negative reaction. The sample size, as mentioned previously, differs minorly from the broad long-term analysis and is 1011 deals for the short-term analysis. The results for the pooled sample are summarized in Table 6.

Table 6. Announcement-period CAARs from the pooled sample.

Table presents the cumulative average abnormal returns together with the t-statistic used to test their significance. The markings ***, ** and * represent their statistical significance with the significance levels 0.01, 0.05 and 0.10.

Event window	CAAR (%)	t-statistic
[-1, +1]	2.339	10.701***
[-2, +2]	2.250	9.317***
[-5, +5]	2.387	8.291***

A positive pooled average does not imply that all deals are value-enhancing. Instead, it reflects the average of heterogenous transactions and the market's aggregation of expected synergies and financing implications at the announcement. Importantly, even in settings where the pooled mean is positive, it remains essential to examine whether the market reaction varies systematically with key deal characteristics, such as the method of payment. The next subsection composes announcement period abnormal returns by payment method and directly tests whether cash and stock deals exhibit statistically distinguishable reactions.

4.2.2 Announcement effects by payment method

Splitting the sample by payment method reveals some striking patterns. First, announcement reactions are positive for both cash- and stock-financed acquisitions, implying that the market does not view either financing mode as categorically value-destructive in this Nordic setting. Second and perhaps the more striking result is that the magnitude of the reaction differs systematically across payment methods: stock-financed acquisitions exhibit substantially larger CARs than cash-financed acquisitions in every reported event window. The outperformance of stock deals goes against the mainstream of prior research, hence calling for more rigorous analysis.

In the baseline [-1, +1] window, the mean CAAR for cash-financed deals is approximately +1.89%, whereas stock-financed deals display a mean CAAR of approximately +4.65%. The same ordering holds in wider windows. In [-2, +2], cash deals average roughly +1.85% while stock deals average

roughly +4.30%. In [-5, +5], cash deals average roughly +1.92% and stock deals roughly +4.78%. Within-group one-sample tests indicate that these positive average CARs are statistically different from zero for both financing modes, consistent with the interpretation that acquisition announcements tend to be received favourably by investors in this sample. Table 7 showcases the broad results by payment type.

Table 7. Announcement-period CAARs by payment type.

Table presents the cumulative average abnormal returns together with one-sample significance tests. The markings ***, ** and * represent their statistical significance with the significance levels 0.01, 0.05 and 0.10. The sample size for cash deals is 846 and for stock deals is 165 in this instance.

Window	Cash CAAR (%)	Stock CAAR (%)
[-1, +1]	1.891***	4.646***
[-2, +2]	1.852***	4.302***
[-5, +5]	1.922***	4.781***

The key comparative result is the cash-stock difference. Across windows, the cash-minus-stock difference is consistently negative and economically material, ranging from roughly -2.45 to -2.86 percentage points. Parametric difference-in-means test rejects equality in each window at conventional levels. The non-parametric rank-based evidence is directionally consistent. While the Wilcoxon rank-sum test is weaker in the mid-sized [-2, +2] window, it does support a statistically significant wedge in the baseline [-1, +1] and in the wider [-5, +5] window. Finally, a permutation-based randomization test provides additional support: by generating the null distribution of the cash-stock difference through repeated reassignment of the payment label while preserving group sizes, the resulting empirical p-values indicate that the observed wedge is unlikely to arise from random sampling variation alone. The comparative results of these three statistical tests are summarized in Table 8.

Table 8. Cash minus stock difference tests.

Table presents the cumulative average abnormal return differences for the two payment method groups and the test p-values for each of the three difference tests: the t-test, the Wilcoxon rank-sum test and the permutation-based randomization test.

Window	Diff	p (t-test)	p (Wilcoxon)	p (Permutation)
[-1, +1]	-2.755	0.003	0.012	<0.001
[-2, +2]	-2.450	0.0017	0.262	<0.001
[-5, +5]	-2.859	0.016	0.043	<0.001

Taken together, the subsample event study results suggest that, in the Nordic listed-acquirer data, the stock-financed subset is associated with a more positive immediate market response than the cash-financed subset. This pattern contrasts with the most prominent U.S. -centric adverse-selection narrative, where stock payments are often interpreted as a negative signal of bidder overvaluation. In the Nordic context characterized by strong investor protection, relatively high transparency and concentrated ownership, the informational stigma of stock payment may be weaker. Instead, investors may interpret stock financing more as risk-sharing, deal feasibility in larger transactions or an incentive-alignment device that ties the seller to post-deal performance.

4.2.3 Multivariate event-study evidence

To assess whether the payment-method wedge documented in the raw CAAR comparisons is driven by observable differences in acquirer characteristics, the thesis estimates cross-sectional regressions where the dependent variable is the deal-level announcement CAR for each event window. The regressions include a cash-payment indicator, a parsimonious set of pre-deal covariates as well as deal-year and country fixed effects. Standard errors are clustered at the acquirer level to account for within-firm dependence from repeated acquisition activity.

The specification is designed to isolate the incremental association between payment method and announcement-period returns after accounting for baseline bidder characteristics that are plausibly related to both financing choice and expected acquisition gains. Importantly, the coefficient on the cash indicator should be interpreted as the conditional cash-stock difference in the given event window, rather than a causal estimate. As such, the multivariate results primarily serve as a robustness check for the univariate CAAR evidence and provide a more controlled benchmark for subsequent analyses that explicitly address selection and comparability through matching.

Across all event windows, the estimated coefficient on the cash indicator is negative and economically meaningful. In the baseline [-1, +1] window, the cash coefficient is approximately -1.86 percentage points; in [-2, +2] it is approximately -2.01 percentage points and in [-5, +5] it is approximately -2.23 percentage points. The similarity in magnitude across windows indicates that the cash-stock wedge is not an artefact of a specific choice of event horizon. In statistical terms, the cash coefficient is borderline to conventionally significant depending on the window, but its sing and magnitude are stable. These results are summarized in Table 9.

Table 9. Multivariate event-study regressions in separate windows.

This table reports multivariate cross-sectional regressions where the dependent variable is the deal-level cumulative abnormal return (CAR) over the announcement window indicated in the column header. The key explanatory variable is Cash, an indicator equal to 1 for cash-financed acquisitions. Control variables are measured in fiscal year t-1 and include Size, Leverage, Liquidity, Profitability and Valuation. All specifications include deal-year and country fixed effects, with standard errors clustered at the acquirer level. Coefficients are reported with standard errors in parentheses. Statistical significance is denoted by ***, ** and * for the levels 0.01, 0.05 and 0.10.

	CAR [-1, +1]	CAR [-2, +2]	CAR [-5, +5]
Cash (treat = 1)	-0.019	-0.020	-0.022
	(0.001)	(0.011)	(0.012)
Size	-0.007***	-0.006***	-0.006***
	(0.001)	(0.001)	(0.002)
Leverage	0.011	0.013	0.021
	(0.013)	(0.014)	(0.017)
Liquidity	0.006	0.008	0.027
	(0.022)	(0.028)	(0.034)
Profitability	0.001	0.001	0.001
	(0.000)	(0.000)	(0.000)
Valuation	0.001	0.001	0.001
	(0.000)	(0.000)	(0.000)
R^2 (Adj.)	0.122	0.983	0.078
	(0.081)	(0.535)	(0.046)

The pooled stacked specification reinforces this conclusion. In the pooled model, the estimated cash coefficient remains around -2.19 percentage points and is statistically significant at conventional levels. Moreover, interaction terms between the cash indicator and the wider event-window dummies are small and statistically indistinguishable from zero, suggesting that the estimated wedge does not materially expand or contract when the event window is widened. Taken together, the multivariate evidence supports the interpretation that stock-financed acquisitions receive more positive announcement-period reactions than cash-financed acquisitions in this sample, and that this pattern

is not explained away by simple observable differences in acquirer fundamentals and fixed effects. The pooled stacked regression is summarized in Appendix 2.

Importantly, these regressions are interpreted as robustness diagnostics rather than causal estimates. Payment choice remains endogenous and observed deal attributes may correlate with both payment method and announcement reactions. Nevertheless, the persistence of the negative cash coefficients after covariate adjustment strengthens the internal consistency of the event-study evidence and motivates the subsequent discussion of mechanics in the Nordic institutional setting.

4.2.4 Link to long-run analysis

The event-study results capture the market's immediate assessment of acquisition announcements and the informational content of the chosen payment method. In the short run, announcement period abnormal returns reflect how investors update beliefs about expected synergies, integration risks and the implications of deal financing at the time information becomes public. As such, short horizon CARs are best interpreted as a measure of beliefs and expectations at announcement rather than as a direct measure of realized post-acquisition performance.

As a result, short- and long-run outcomes need not coincide. If announcement reactions reflect partly optimistic expectations that later fade, long-run operating and valuation measures may weaken relative to the initial market response. Conversely, if announcement reactions understate integration difficulties or overstate discipline effects, long-run operating outcomes may diverge from initial beliefs.

The payment-method difference in announcement returns also raises a natural compositional question that is especially relevant in the Nordic institutional setting discussed: stock-financed acquisitions may represent a more selectively chosen subset of deals. If equity payment is used primarily in transactions that are strategically compelling, larger in scale or otherwise distinct from typical cash deals, the short-run stock premium may partly reflect selection rather than a general superiority of equity payment. This interpretation is consistent with the fact that the stock-financed subsample is smaller than the cash-financed subsample. This motivates examining whether long-run differences persist once comparisons are made among more comparable deals.

4.3 Raw long-term performance

4.3.1 Baseline specification

This subsection analyses baseline long-term regression evidence on whether the payment method of an acquisition is associated with subsequent acquirer performance. The analysis uses the full complete-case dataset and thus serves as a broad benchmark prior to the matching-based design presented later. The regressions follow the empirical specification outlined earlier in the thesis, where post-deal performance is measured at +1, +2 and +3 years each, with the indicator for cash-financed transactions as the focal explanatory variable. The coefficient captures the average difference in post-deal performance between the two types of financing solutions, conditional on the included control set and year fixed effects.

In interpreting this evidence, it is crucial to point out that the full-sample results are best understood as conditional associations rather than as fully causal estimates. The payment method decision needs to be understood as a managerial choice endogenous to deal conditions and firm characteristics. This motivates the later PSM analysis, where the goal is to improve comparability between treated and control observations before estimating the differences in outcomes.

All regressions are estimated with deal-year fixed effects and standard errors clustered at the acquirer level. Deal-year fixed effects absorb common year-specific shocks that could affect both payment method and performance outcomes, while clustering acknowledges that the same acquirer can appear in multiple deals and thus induces within-firm error correlation. Each model is estimated on the same sample size, which improves comparability across outcomes and horizons. Table 10 summarizes these raw long-term models, and their results are further discussed in the upcoming sections, one measure at a time.

Table 10. Baseline long-run regressions: operating and valuation outcomes.

This table reports baseline long-run regressions estimated on the raw and unmatched sample and consists of a unique panel for each of the three measures. The dependent variable is the post-deal outcome measured at horizons t+1, t+2 and t+3. Cash equals 1 for cash-financed deals and 0 for stock-financed deals; the reported coefficient captures the cash-stock difference in the outcome, conditional on the baseline controls described earlier. Coefficients are reported with standard errors in parentheses. Statistical significance is denoted by ***, ** and * for the levels 0.01, 0.05 and 0.10.

	ROA t+1	ROA t+2	ROA t+3
Cash (treat = 1)	6.007***	6.733**	4.635*
	(1.655)	(2.556)	(1.800)
R^2 (Within)	0.109	0.171	0.165
	(0.087)	(0.106)	(0.107)

	ROIC t+1	ROIC t+2	ROIC t+3
Cash (treat = 1)	-13.909	6.230	6.774
	(16.077)	(5.745)	(9.300)
R^2 (Within)	0.173	0.080	0.086
	(0.153)	(0.021)	(0.043)

	Tobin's Q t+1	Tobin's Q t+2	Tobin's Q t+3
Cash (treat = 1)	0.107	0.748*	0.275
	(0.506)	(0.454)	(0.532)
R^2 (Within)	0.660	0.595	0.562
	(0.652)	(0.585)	(0.556)

4.3.2 Accounting performance: ROA results

The first set of models focuses on ROA, an accounting-based measure reflecting profitability relative to assets. Across all three horizons, the estimated cash-versus-stock coefficient is positive and statistically meaningful. Specifically, the coefficient is 6.007 for ROA at t+1, 6.733 for t+2 and 4.635 for t+3. The first coefficient is highly significant, the second is significant at conventional levels and the third also remains statistically significant at the 5% level. Substantively, this pattern suggests that cash-financed acquisitions are associated with higher post-deal ROA in the subsequent one to three years relative to stock-financed acquisitions, conditional on the specified controls and deal-year effects.

Two specific features of the ROA pattern are worth highlighting. First, the positive coefficients persist across multiple horizons rather than appearing only at t+1, which is consistent with the idea that the factors that distinguish cash and stock deals may carry through into medium-term realized

performance rather than only reflecting short-lived post-deal adjustments. Second, the magnitude declines towards the end, which is consistent with a scenario where initial post-merger integration effects and synergy realization are strongest in the earlier post-deal years and attenuate over time. Importantly, however, these baseline regressions cannot by themselves conclude whether the estimated ROA advantage reflects a true payment-method effect or simply differences in the types of firms and deals that select into cash financing.

From the perspective of model fit, the ROA regressions exhibit modest explanatory power, with overall R^2 values around 0.11-0.17. In fixed-effects settings, R^2 is often a more informative measure because it captures how much variation is explained after accounting for the included fixed effects. The reported values therefore indicate that, beyond deal-year effects and controls, a meaningful but not overwhelming share of the remaining variation in ROA is accounted for by the included regressors. This is consistent with the broader corporate finance literature where post-merger performance is influenced by many unobserved integration, strategic and managerial factors.

4.3.3 Profitability and capital efficiency: ROIC results

The second set of models uses ROIC, intended to capture profitability relative to invested capital and thus more directly reflect capital efficiency. In contrast to ROA, the ROIC results do not display a robust and consistent pattern across horizons. At t+1, the estimated cash-versus-stock coefficient is negative at -13.909 but is not statistically distinguishable from zero. At t+2 and t+3 the coefficients turn positive at 6.230 and 6.774 but again remain insignificant in a statistical sense. In other words, the raw regressions do not provide strong evidence that the payment method is systematically associated with ROIC outcomes in the years following the acquisition.

The divergence between ROA and ROIC is informative for interpretation. Whereas ROA is an asset-based profitability measure that can be affected by accounting dynamics and balance sheet changes following acquisitions, ROIC is more directly tied to returns on invested capital and can be sensitive to measurement definitions, accounting treatments of goodwill and the timing of post-merger integration effects. The lack of robust ROIC differences suggests that the positive ROA association should not be automatically interpreted as broad-based improvement in economic efficiency. Instead, it may reflect profitability changes that do not translate cleanly into ROIC, or it may reflect noise in the ROIC measure in this exact dataset. That is precisely why examining multiple performance metrics is valuable: it reduces the risk that conclusions are driven by a single measure's idiosyncrasies.

The models also exhibit lower R^2 values than the ROA counterparts at longer horizons, which is consistent with ROIC being harder to explain using the included covariates and deal-year covariates alone. This further supports a cautious reading of ROIC results: the data do not show strong, stable differences by payment method using this metric in the baseline specification.

4.3.4 Market-based performance: Tobin's Q results

The third set of models uses Tobin's Q as a market-based valuation metric. The estimated cash-versus-stock coefficients are positive at every time interval but generally weak and lacking statistical significance, being 0.107 for t+1, 0.748 for t+2 and 0.275 for t+3. Only the t+2 estimate reaches statistical significance at the 10% level. Overall, the baseline evidence therefore does not indicate a robust difference in post-deal Tobin's Q between cash- and stock-financed acquisitions.

This result is noteworthy when contrasted with the ROA pattern. Market-based metrics like Tobin's Q reflect not only realized performance but also investor expectations about future growth opportunities and the quality of strategic investment. The absence of a clear and stable Tobin's Q difference suggests that the market does not, in the medium-term, consistently value cash-financed deals more highly than stock-financed deals once the regression controls and year effects are accounted for. A plausible interpretation is that whatever accounting-based profitability differences are present do not translate into a systematic valuation premium or that valuation effects are primarily reflected in short-term announcement responses rather than in medium-term Q levels. This reinforces the value of combining the event-study evidence with long-term accounting outcomes: the two speak to different dimensions of acquisition performance and may legitimately diverge.

The Tobin's Q models have comparatively high R^2 values, indicating that within-year variation in Q is more strongly explained by the included specification than is the case for the accounting outcomes. This necessarily does not surprise because valuation measures can be closely related to firm characteristics included as controls and may share stronger contemporaneous relationships with size and growth proxies. However, high fit does not substitute for causal identification; the relevant question remains whether the payment method coefficient is robust and interpretable, which it is not in these baseline estimates.

4.3.5 Summary of raw evidence

Taken together, the full-sample regressions present a clear pattern for ROA but a considerably weaker pattern for ROIC and Tobin's Q. Cash financing is associated with higher post-deal ROA across t+1, t+2 and t+3 while no robust differences emerge for ROIC. Market-based valuation differences are at

most marginal at t+2. This cross-metric heterogeneity is important for the thesis narrative. It suggests that any cash advantage is not uniformly visible across performance dimensions, which cautions against overly broad interpretations and highlights the need to triangulate across measures.

At the same time, these baseline results should be read in light of the endogeneity concern discussed earlier: payment method is a choice variable and is likely correlated with firm characteristics, deal conditions and potential unobservable factors concerning private information or deal quality. The descriptive statistics and pre-deal imbalance diagnostics indicate that cash and stock deals differ substantially prior to matching. Consequently, the positive ROA association could reflect selection effects rather than a causal impact. This gives clear motivation to the subsequent propensity score matching design, which restricts inference to a subset of deals where treated and control observations are observably comparable and where overlap supports a credible counterfactual interpretation. The matched long-term regressions therefore provide a complementary and more design-oriented benchmark to assess whether the raw ROA pattern persists when comparability gets improved.

4.4 PSM design and diagnostics

This section evaluates the overall quality of the propensity score matching design introduced earlier by focusing on what matching accomplishes in this exact dataset: how the estimation sample changes, whether common support is adequate and to what extent balance on observed pre-deal covariates improves. Such reporting is important because PSM can only strengthen causal interpretation if it demonstrably constructs a comparison group that resembles the treated group in terms of baseline characteristics and if inference is restricted to regions where the data provide plausible counterfactuals. In other words, the credibility of the matched long-term regressions depends on whether the matching design yields acceptable overlap and covariate balance in practice (Rubin, 2001; Garrido et al., 2014).

In accounting and finance research, this kind of reporting is increasingly treated as a requirement rather than an optional add-on: matching is a design step, and its credibility depends on whether overlap and balance actually improve in the data (Shipman et al., 2017). More generally, applied econometric guidance emphasizes that these strategies should be accompanied by explicit overlap diagnostics and balance evidence, because otherwise the analysis risks becoming driven by extrapolation or by comparisons between fundamentally different observations (King & Nielsen, 2019; Caliendo & Kopeinig, 2008; Imbens & Wooldridge, 2009).

The complete estimation sample available for the propensity score model contains 1050 acquisitions, of which 883 are cash-financed (treated) and 167 are stock-financed (controls). This strong asymmetry is not only descriptive but also has direct consequences for feasibility and interpretation. When controls are scarce relative to treated observations, nearest-neighbour matching without replacement often either discards a large share of treated observations or yields low-quality matches. In such cases, researchers usually face a bias-variance trade-off. Stricter matching constraints improve comparability but reduce the usable sample and can decrease statistical power (Shipman et al., 2017).

Consistent with this logic, the matching design in this thesis uses nearest-neighbour matching with a caliper restriction and exact matching on deal year, implemented with replacement. With replacement allows a control observation to serve as a match for multiple treated observations when the control pool is small, thereby improving feasibility and reducing the need to accept poor matches simply to preserve treated retention. The trade-off is that replacement can concentrate identifying variation on a subset of controls, which can reduce precision. This trade-off is well recognized in the econometric literature on matching estimators and motivates careful reporting of weights and effective sample size (Abadie & Imbens, 2006).

4.4.1 Sample retention, unmatched observations and the implications of matching with replacement

A core diagnostic output of any matching design is how it changes the usable sample. The matched dataset contains 679 observations in unweighted counts: 570 treated and 109 controls. A total of 371 observations remain unmatched, including 313 treated and 58 controls. These figures should be interpreted as informative rather than problematic. Matching is never intended to preserve the full dataset, rather, it is meant to restrict inference to those transactions for which plausible counterfactual comparisons exist under the chosen design constraints. Especially in settings with limited overlap, such restriction is often desirable because it prevents estimates from being dominated by comparisons between non-comparable observations or by implicit extrapolation into regions with little empirical support (Imbens, 2004).

As the matching is performed with replacement, the matched sample contains weights. Intuitively, weights reflect how often a given control observation is used as a match. Consequently, 1 to 1 matching does not imply a set of unique one-to-one pairs in the literal sense when replacement is allowed. It implies one matched control per treated observation, where some controls may be reused. This feature is particularly relevant in this dataset due to the smaller control pool. This is also an

expected consequence of replacement matching in imbalanced samples and illustrates the standard trade-off: improved feasibility and match quality, potentially reduced precision due to weight concentration (Abadie & Imbens, 2006).

From an interpretation point of view, these diagnostics have two important boundary implications. Firstly, matched-sample results should be understood as applying to an overlap population, which is the subset of cash-financed acquisitions for which sufficiently similar stock-financed acquisitions exist. Second, because controls carry unequal weight, subsequent matched regressions should respect the weighting structure implied by the matching procedure, otherwise the analysis would not correspond to the design that generated the matched comparison set (Shipman et al, 2017).

4.4.2 Covariate balance

The most direct test of match quality is covariate balance. Following best practice in accounting applications of PSM, balance is evaluated using standardized mean differences (SMDs) rather than significance tests. because SMDs provide a scale-free measure of imbalance that is not mechanically driven by sample size.

In this thesis, the balance diagnostics show substantial improvement across almost all covariates. After matching, SMDs for key variables are close to zero or well below commonly used thresholds. The post-matching SMDs are 0.015 for size**,** 0.085 for leverage, -0.008 for cash/assets, 0.083 for market-to-book, 0.080 for baseline ROA and -0.025 for baseline Tobin's Q. Deal year is balanced by construction due to exact matching. One covariate remains marginally above the frequently used 0.1 benchmark, as the baseline ROIC has an SMD of 0.111. The SMDs are summarized in Table 11.

Table 11. Covariate balance before vs after matching (SMDs)

This table reports standardized mean differences (SMDs) for the covariates used in the propensity score model, comparing the unmatched sample to the matched sample after propensity score matching. SMDs are reported as the difference in covariate means between cash and stock groups, scaled by the pooled standard deviation. Values closer to zero indicate better balance. The "Unmatched" column captures baseline selection differences prior to matching, where as the "Matched" column shows the remaining imbalance after matching.

Covariate (t-1)	SMD (Unmatched)	SMD (Matched)
Size	0.702	0.015
Leverage	0.186	0.085
Liquidity	-0.255	-0.008
Valuation	-0.765	0.083
ROA	0.817	0.080
Tobin's Q	0.081	-0.025
ROIC	1.285	0.111

This remaining imbalance is small and does not undermine the overall conclusion that matching materially improves comparability. Still, it is important to note because it motivates a cautious approach in the matched outcome analysis. This combination is a standard strategy in applied work: matching reduces model dependence by improving comparability, while regression adjustment can account for minor residual imbalance and improve efficiency (Shipman et al., 2017).

The Love plot provides a visual summary of these changes, showcased in Figure 5. It illustrates that balance improvement is broad-based across the full set of covariates rather than driver by only a few variables. It makes easier to identify remaining outliers and to assess whether imbalance is systematic or isolated. Importantly, explicit balance visualization aligns with the emphasis on transparency in PSM reporting and on documenting the success of the design step.

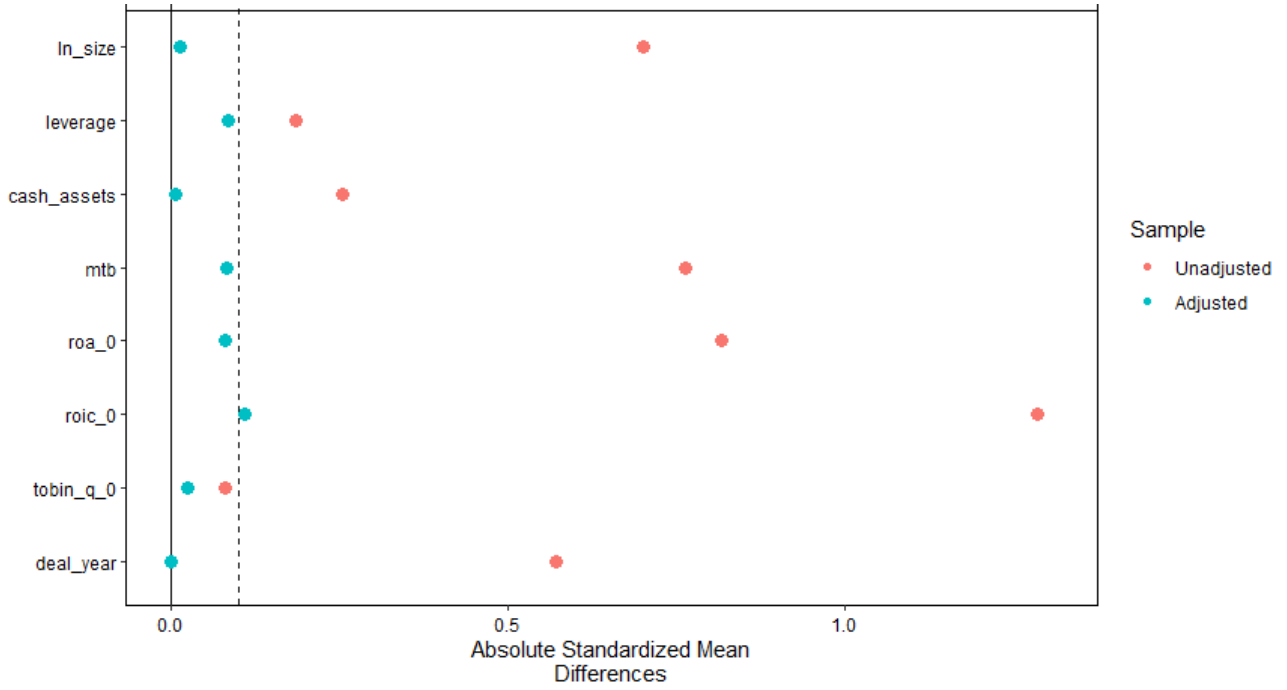

Figure 5. The Love plot.

This figure depicts absolute standardized mean differences (SMD) for baseline covariates before (red) and after (teal) matching. The vertical dotted line marks the 0.10 threshold commonly used to indicate adequate balance. Post-match SMDs concentrate near zero across covariates, indicating materially improved covariate balance relative to the unmatched sample. Residual imbalances remain below the 0.10 guideline, supporting the comparability of cash- and stock-financed deals in subsequent analyses.

4.4.3 Diagnostics summary

Overall, the diagnostics support the conclusion that the implemented matching procedure materially improves comparability between cash- and stock-financed acquisitions on observed baseline characteristics, while also clarifying the scope of inference. The matched sample represents

transactions within a region of adequate overlap and matching with replacement improves the overall feasibility. Consequently, the matched long-term regression estimates should be interpreted as effects for the overlap population, conditional on observables and complemented with full-sample regressions to retain broader robustness. This interpretation is consistent with both econometric guidance on overlap and with accounting-focused discussions emphasizing that matching should be treated in the context of both balance and overlap evidence (Crump et al., 2009; Shipman et al., 2017).

4.5 Long-term performance in the matched sample

4.5.1 Matched-sample specification

This subsection reports long-term performance estimates using the matched sample constructed through the propensity score matching procedure documented earlier. The purpose is to evaluate whether the baseline full-sample associations found earlier persist when comparisons are restricted to acquisitions for which cash-financed deals have observably similar stock-financed counterparts. In the language of program evaluation, the matched analysis is intended to reduce selection on observables by preprocessing the sample and thus lowering reliance on functional-form assumptions in outcome regressions (Shipman et al., 2017).

The matched regression models use the same outcome structure as the raw analysis: post-deal performance is measured at t+1, t+2 and t+3 for the same three outcomes. All models also include deal-year fixed effects and standard errors clustered at the acquirer level.

Importantly, inference in the matched analysis pertains to an overlap population. The overlap population is the subset of cash deals that fall within common support and for which comparable stock-financed deals exist under the matching constraints. This is not just a technical detail but a substantive boundary condition: when overlap is limited, the most defensible approach is to restrict inference rather than implicitly extrapolate beyond the supported region (Crump et al., 2009). In this thesis, the matched sample contains 679 observations, which is materially smaller than the full sample of 1050 observations. The matched design therefore improves comparability but cand reduce statistical power, particularly when matching is performed with replacement and control weights concentrate identifying variation. Table 12 summarizes these PSM models, and their results are further discussed in the upcoming sections, one measure at a time.

Table 12. Long-run performance in the matched sample: operating performance and valuation outcomes.

This table reports baseline long-run regressions estimated on propensity-score-matched sample and consists of a unique panel for each of the three measures. The dependent variable is the post-deal outcome measured at horizons t+1, t+2 and t+3. Cash equals 1 for cash-financed deals and 0 for stock-financed deals; the reported coefficient captures the cash-stock difference in the outcome, conditional on the baseline controls described earlier. Coefficients are reported with standard errors in parentheses. Statistical significance is denoted by ***, ** and * for the levels 0.01, 0.05 and 0.10.

	ROA t+1	ROA t+2	ROA t+3
Cash (treat = 1) vs Stock (0)	2.957*	2.124	1.487
	(1.612)	(1.468)	(1.515)
R^2 (Adj.)	0.117	0.121	0.100
	(0.087)	(0.050)	(0.050)

	ROIC t+1	ROIC t+2	ROIC t+3
Cash (treat = 1) vs Stock (0)	-7.863	1.670	1.792
	(0.010)	(3.139)	(5.382)
R^2 (Adj.)	0.010	0.005	0.033
	(0.004)	(0.019)	(0.009)

	Tobin's Q t+1	Tobin's Q t+2	Tobin's Q t+3
Cash (treat = 1) vs Stock (0)	0.597	0.549	0.536
	(0.558)	(0.436)	(0.457)
R^2 (Adj.)	0.670	0.499	0.578
	(0.662)	(0.485)	(0.565)

4.5.2 Matched accounting performance: ROA results

Compared to the raw regressions, the estimated cash-versus-stock differences in ROA become noticeably smaller and less statistically robust once the analysis is restricted to matched comparisons. At t+1, the cash coefficient is 2.957, which is only marginally significant. At later time intervals, the coefficients are 2.124 for t+2 and 1.487 for t+3, with neither estimate representing statistically distinguishable difference from zero.

This attenuation relative to the full-sample results is substantively meaningful. In the raw analysis, cash-financed deals were associated with significantly higher post-deal ROA across all three horizons. In contrast, in the matched sample the apparent ROA advantage is reduced by roughly half or more and loses conventional statistical significance. One interpretation consistent with the matching logic is that a substantial portion of the raw ROA difference reflects selection. Firms and deals that choose cash differ systematically from those that choose stock, and these baseline

differences correlate with subsequent accounting performance. When matching reduces these baseline differences, the estimated association shrinks. This pattern aligns with the core motivation of PSM as a method to reduce model dependence and isolate comparisons among observably similar units.

At the same time, it is also important to consider the role of precision. The matched sample is smaller, and with replacement matching can concentrate informational content in fewer controls, both of which tend to inflate standard errors. Thus, loss of significance should not automatically be interpreted as a proof of no effect. Rather, it indicates that once comparability is improved and inference is restricted to the overlap population, the data no longer support a strong and precisely estimated ROA difference between payment methods. In terms of thesis narrative, the correct and careful statement is that the robust ROA pattern seen in the full sample weakens materially after propensity score matching is completed.

4.5.3 Matched profitability and capital efficiency: ROIC results

For ROIC, the matched regressions similarly do not provide evidence of robust pots-deal differences by payment method. The estimated coefficients are -7.863 at t+1, 1.670 at t+2 and 1.792 at t+3. None of these coefficients are statistically significant, and the point estimates are relatively modest compared to their uncertainty.

The matched ROIC pattern is consistent with the raw analysis in the sense that ROIC did not yield strong and stable differences even before matching. The matched design, however, strengthens the interpretation: when comparisons are limited to observably similar deals within common support, there is little indication that the payment method is systematically associated with post-deal ROIC. This result is useful precisely because it avoids over-generalizing from a single accounting metric. In corporate finance settings, different profitability measures can respond differently to acquisition accounting, goodwill/intangible recognition and integration timing. The fact that ROIC is not systematically different under either the raw or matched design supports a cautious overall conclusion: any cash advantage is not clearly visible when performance is defined in terms of returns on invested capital.

4.5.4 Matched market-based performance: Tobin’s Q results

The matched regressions for Tobin’s Q also show no statistically robust differences. The estimated cash coefficients are 0.597 at t+1, 0.549 at t+2 and 0.536 at t+3, with none reaching conventional significance. The point estimates are positive, but uncertainty is substantial relative to the magnitudes.

This is informative in two ways. First, it suggests that after matching, the market does not assign a consistent valuation premium to cash-financed deals relative to stock-financed deals in the years following the acquisition. Second, it reinforces the idea that any differences by payment method may be more visible in short-term market reactions than in medium-term valuation levels, or that valuation dynamics are dominated by factors not captured by the payment method once baseline comparability is improved. In other words, the matched Tobin's Q evidence does not support a strong long-term market-based advantage for cash financing in this specific sample.

4.5.5 Linking matched results to matching diagnostics

The matched outcome results should be interpreted alongside the diagnostics reported earlier. The Love plot demonstrates that matching substantially improves covariate balance across the include characteristics, moving most covariates well below conventional imbalance thresholds and aligning treated and control distributions more closely. The propensity score distribution plots further indicate that the matched samples occupy a common propensity score region, while unmatched observations signal where the data do not support credible comparisons. Together, these diagnostics imply that the matched estimates are less likely to be driven by obvious baseline differences between cash and stock deals.

At the same time, the diagnostics also explain why matched estimates can become less precise. Matching reduces sample size and, under replacement, introduces weight concentration on the control side. This is precisely the trade-off emphasized in applied matching discussions: restricting inference to credible comparisons improves internal validity but may reduce statistical power. In the present context, the key empirical takeaway is therefore not that matching makes everything insignificant, but rather that once the analysis is confined to the overlap population where balance is acceptable, the previously strong raw ROA association becomes weaker and less robust across horizons, while ROIC and Tobin's Q remain non-robust.

4.6 Nordic context and interpretation of the evidence

The institutional and market context is relevant when interpreting payment-method differences, because the informational content of cash versus stock financing is not necessarily constant across different countries. Nordic equity markets are typically characterized by comparatively strong investor protection, relatively high disclosure quality and governance structures where ownership can be more concentrated than in many Anglo-Saxon settings. These features can affect both (i) the degree of asymmetric information between insiders and outside investors and (ii) the extent to which agency

conflicts shape managerial financing choices. In such a context, the classic argument that stock financing signals overvaluation or lower-quality deals may be weaker or limited to certain transaction types. Rather than only treating cash versus stock as a universal signal, it is therefore natural to interpret the empirical results in this thesis through a Nordic lens in which selection into payment method and institutional frictions may operate differently across environments.

This contextual perspective is useful in making sense of the key long-run pattern documented in the prior chapters. In the full sample, cash-financed acquisitions are associated with a sizeable and statistically strong ROA advantage across post-deal horizons. However, once the analysis is restricted to the matched population, the estimated difference diminishes substantially and becomes statistically weaker. Taken together, this suggests that a meaningful portion of the full-sample ROA pattern is attributable to observable selection into payment method: cash-financed deals appear to be undertaken by firms and under conditions that are more conducive to subsequent accounting performance. In a Nordic environment where stock-financed deals are relatively rare and may represent a more distinct subset of transactions, this selection component is particularly plausible. The implication is not that payment method is irrelevant, but that the magnitude of any payment-method difference is likely smaller and more context-dependent than what a full-sample comparison would showcase.

The absence of robust matched effects for ROIC and Tobin's Q further reinforces this interpretation. ROIC is intended to capture capital efficiency more directly than ROA and Tobin's Q reflects market-based valuation rather than accounting profitability. In both the full-sample and matched analyses, these measures do not show consistent, statistically robust differences between different types of acquisitions. One interpretation is that even if cash-financed acquisitions are associated with higher post-deal profitability measured by ROA in broad samples, this does not translate into an equally clear advantage in capital efficiency or market valuation once baseline comparability is improved. Another interpretation is that any true effect is small relative to the noise and heterogeneity in these measures, especially when inference is restricted to the overlap population. Both interpretations point toward a cautious reading: the long-run evidence does not support a strong, uniform cash superiority claim across outcome definitions in the Nordic setting.

4.7 Robustness

In this thesis, robustness is built into the empirical design rather than added as an afterthought. The central results are evaluated across complementary methods, time horizons and outcome definitions

to reduce dependence on any single modelling choice and to strengthen external interpretability overall.

First, the short-run event-study evidence is robust in two distinct senses. The payment-method pattern is not tied to a particular event window: the qualitative ordering of announcement reactions by payment method is preserved when the window is widened from the baseline to broader horizons. In addition, inference does not rest on a single statistical lens. Mean-based tests are complemented by non-parametric evidence and randomization-based testing, which is particularly informative given the imbalance in group sizes between cash- and stock-financed deals. Finally, the conclusion is supported not only by univariate comparisons but also by cross-sectional CAR regressions that condition on observable bidder fundamentals and absorb common stocks through fixed effects. Together, these layers reduce the risk that any event-study findings are an artefact of a specific window choice, distributional assumption or simple sample composition.

Second, the event-study regressions incorporate safeguards against common sources of spurious precision in deal-level analysis. Fixed effects control for systematic differences across countries and time, ensuring that the cash-stock comparison is not driven by persistent market-level heterogeneity or year-specific shocks. Moreover, standard errors are clustered at the acquirer level to account for within-firm dependence when the same bidder conducts multiple acquisitions over the sample period. This is important in M&A settings where repeat acquirers may generate correlated announcement reactions that would otherwise lead to overconfident inference.

Additionally, the long-run analysis strengthens generalizability by triangulating performance with multiple outcome families rather than relying on a single success metric. Operating measures ROA and ROIC capture realized post-acquisition implementation and capital allocation, while valuation-based measure Tobin's Q reflects both realized performance and market reassessment. These measures need not move in accordance, as divergence between horizons and metrics can itself be informative about the underlying mechanisms. Reporting these outcomes side by side therefore reduces the risk of drawing conclusions from one potentially noisy proxy.

The selection concerns are addressed most explicitly where they are most consequential: in long-horizon performance comparisons. Payment method is not randomly assigned and acquirer and deal characteristics that influence financing choice are also plausibly related to post-acquisition outcomes. The propensity score matching framework is therefore used to improve comparability on observables in the long-run setting. Presenting both unmatched and matched estimates clarifies how much of the raw cash-stock difference can be attributed to observable selection and whether any residual

difference remains among more comparable deals. This approach reduces model dependence and provides a transparent robustness check against the concern that long-run differences reflect pre-existing firm characteristics rather than actual performance.

Differences across analysis samples are a deliberate consequence of data requirements rather than a source of hidden discretion. Event-study estimation requires sufficiently long and continuous daily return series around the announcement, whereas long-run analysis requires multi-year accounting coverage and complete covariate information. As a result, the effective sample necessarily varies across empirical modules. The thesis mitigates this concern by reporting sample sizes consistently in the relevant tables and by interpreting each set of results within the population it is designed to measures.

Taken together, these design choices support the generalizability of the main conclusions within the Nordic listed-acquirer context. At the same time, the thesis is careful not to overclaim causality in settings where endogeneity cannot be fully eliminated. The short-run evidence is interpreted as the market's contemporaneous assessment of the chosen payment method, while the long-run evidence is evaluated with explicit attention to comparability and selection. This combination produces a coherent and methodologically transparent robustness narrative without relying on a large set of auxiliary tests.

5 Discussion

5.1 Key findings

This thesis set out to examine how the method of payment in acquisitions is related to short-run market reactions around the announcement and longer-run operating and valuation outcomes, with a particular focus on the Nordic institutional context. The empirical results provide a coherent picture across horizons.

Regarding the first research question, the event-study evidence indicates that acquisition announcements are, on average, received favourably by investors in the Nordic listed-acquirer sample, and that the market reaction differs systematically by method. Stock-financed acquisitions exhibit materially larger announcement-period abnormal returns than cash-financed acquisitions across standard event windows, and the pattern remains visible when the analysis is conditioned on observable acquirer fundamentals and fixed effects in cross-sectional CAR regressions. The short-run evidence therefore suggests that, within the Nordic setting, the method of payment carries information that investors incorporate quickly into bidder prices.

Turning to the second research question, the long-run analysis shows that performance differences between cash- and stock-financed acquisitions are metric-dependent and sensitive to comparability adjustments. Across operating measures, the raw comparisons point to differences that are broadly consistent with the idea that acquisitions financed with cash can be associated with more favourable post-acquisition operating outcomes. However, once the analysis places greater emphasis on comparability most notably via matching, the long-run differences tend to attenuate, and the evidence becomes less supportive of a straight-forward narrative. For valuation-based outcomes such as Tobin's Q, the results are generally weaker and more episodic than for operating outcomes, which is consistent with the notion that market-based valuation measures incorporate not only realized performance but also broader valuation dynamics.

Finally, the third question concerns interpretation in the Nordic context. The short-run finding that stock-financed acquisitions are greeted more positively than cash-financed acquisitions is not the canonical pattern often highlighted in US-centric evidence, where stock financing is frequently interpreted as a negative signal of bidder overvaluation. In the Nordic setting, the informational meaning and selection into payment methods may plausibly differ. The results therefore support the broader idea that institutional environment and ownership structure can shape the informational

content and market interpretation of acquisition financing choices, even if the thesis does not claim a causal difference in a strict experimental sense.

Taken together, the thesis produces a consistent empirical structure across horizons. The method of payment is strongly associated with how markets interpret acquisitions at announcement, while long-run realized performance differences are more nuanced, partly reflecting selection into payment types and the distinct informational content of operating versus valuation measures. This is an important synthesis because it suggests that short-run enthusiasm for certain deal types does not mechanically translate into superior long-run operating outcomes, and that inferences about acquisition success depend on the chosen horizon and metric.

Overall, the evidence does not support H1 in the Nordic sample, as announcement-period abnormal returns are larger for stock-financed than for cash-financed acquisitions. The long-run evidence provides at most partial support for H2: in the full sample, cash-financed deals are associated with higher post-deal ROA, but the difference attenuates materially in the matched sample and does not generalize to ROIC or Tobin's Q. Finally, the attenuation of long-run differences under improved comparability, together with the Nordic-specific pattern, is consistent with H3 in the sense that canonical cash-stock differences appear weaker and more context-dependent in this setting.

5.2 Theoretical and practical implications

5.2.1 Implications for theories of payment method

A central contribution of the thesis is to assess which theoretical mechanisms best fit the joint pattern of short-run and long-run evidence. The first benchmark is the information asymmetry and signaling view. Classic signaling interpretations often predict weaker bidder reactions to stock financing because equity can be used when managers perceive their shares to be overvalued or when adverse selection concerns are high (Travlos, 1987; Myers & Majluf, 1984). Under this logic, stock-financed acquisitions should be greeted less positively than cash-financed acquisitions. The thesis' short-run evidence does not align with this baseline prediction in the Nordic sample: stock-financed acquisitions are associated with larger announcement gains than cash-financed acquisitions. This does not invalidate signaling as a mechanism, but it suggests that the negative signal of a stock decision may be weaker or context-dependent here. Two broad interpretations are consistent with the findings. First, the informational environment may be sufficiently transparent that stock issuance carries less stigma, limiting adverse-selection concerns. Second, equity payment may convey information other

than misvaluation. Examples of such would be willingness to share risk or an alignment of incentives between bidder and seller such that the net signal becomes positive rather than negative.

The second mechanism is the exchange medium and risk-sharing perspective. In classic models, payment method is a contractual device that allocates valuation risk between bidder and target, and stock can be an efficient exchange medium when uncertainty about target value or synergy realization is high (Hansen, 1987; Eckbo et al., 1990). In that view, stock does not necessarily signal overvaluation but instead represents risk sharing and facilitates agreement when valuation uncertainty is material.

The thesis' short-run results are consistent with the possibility that Nordic investors interpret stock financing as a rational financing device in transactions that are potentially larger or more uncertain, rather than as a negative signal. This interpretation is especially plausible if stock-financed deals are disproportionately associated with settings where risk sharing is valuable, such as cross-border acquisitions, relatively large targets or strategically transformative deals. The event-study evidence alone cannot adjudicate the precise channel, but it is consistent with a positive market interpretation of stock as an exchange medium in this context.

A third theoretical lens is misvaluation and market timing in acquisitions. If overvalued bidders use stock as acquisition currency, one might expect stock-financed acquisitions to be associated with weaker subsequent performance as valuations revert, even if announcement reactions are temporarily positive (Shleifer & Vishny, 2003). Rational merger-wave mechanisms further highlight how market-wide valuation conditions can coincide with elevated stock-financed activity (Rhodes-Kropf & Viswanathan, 2004).

The thesis' long-run evidence does not contradict the possibility that valuation dynamics play a role. At the same time, the short-run stock premium suggests that, at least contemporaneously, the market does not interpret stock payment predominantly through a misvaluation exploitation lens in this sample. The combined evidence therefore points toward a nuanced conclusion: valuation considerations may matter, but the Nordic market's immediate reaction does not resemble the standard adverse-selection narrative, and selection and governance may be equally or more important for interpreting payment method here.

Overall, the theoretical implication is not that one theory dominates across the board, but that the Nordic evidence fits best with a combination of risk sharing and exchange-medium considerations

and governance mechanisms, while a strict adverse-selection interpretation of stock financing appears less descriptive of this setting.

5.2.2 Reconciling short-run and long-run evidence

Considering both the short-run and long-run findings clarify what can and cannot be inferred from announcement returns. Short-run CARs measure the market's immediate reassessment of value at the time of the announcement. Long-run accounting and valuation outcomes, in contrast, reflect realized integration, operational execution and subsequent information arrival. Divergence between short-run and long-run results is therefore informative rather than problematic. It suggests that expectations at announcement and realized implementation do differ and that different metrics capture different channels.

In this thesis, the short-run evidence is unambiguous in direction. It shows that stock-financed acquisitions receive larger positive announcement reactions than cash-financed acquisitions. The long-run evidence is more nuanced, as some measures and specifications suggest differences consistent with cash financing being stronger in terms of operating outcomes. However, these differences attenuate when the analysis emphasizes comparability through propensity score matching. This pattern is consistent with two complementary interpretations. First, the announcement premium for stock deals may partly reflect selection into a subset of transactions that are viewed as particularly value-relevant at the time of the announcement. Second, even when the market reacts positively, realized operating gains may depend on integration and execution quality in ways that are not fully predictable at the announcement date.

The metric dependence of long-run findings is also meaningful. Operating measures such as ROA and ROIC are closely tied to realized performance but are affected by purchase accounting, integration costs and the timing of synergy realization. Valuation measures such as Tobin's Q can react to both realized performance and valuation conditions and may therefore be noisier or more sensitive to mean reversion. As a result, the strongest long-run implication should be anchored in operating outcomes, with valuation outcomes interpreted as complementary evidence about market reassessment.

5.2.3 Implications for the Nordic setting and external validity

The Nordic setting matters for interpreting the results because it plausibly shapes both information frictions and selection into payment methods. The Nordics are generally characterized by strong legal institutions and investor protections, and many listed firms exhibit concentrated ownership and active

block holders. These features can reduce information asymmetry relative to markets with weaker disclosure and enforcement, potentially weakening adverse-selection interpretations of equity financing. At the same time, concentrated ownership can increase the private cost of control dilution, making equity payment less attractive unless the deal is compelling, thereby strengthening selection into stock-financed acquisitions. Both forces push in the same qualitative direction and may make stock financing less likely to be interpreted as a negative signal and more likely to be associated with positively selected transactions.

From an external validity perspective, the thesis therefore contributes to a broader point of the informational content of payment method being dependent on the context. Results from one institutional environment should not be mechanically extrapolated to another. The present evidence suggests that, for Nordic listed bidders, the market does not treat stock-financed acquisitions as systematically suspect at announcement. Instead, the market reaction is more consistent with risk sharing and selective use of equity in strategically meaningful transactions. This does not imply that the Nordics are special in a narrow sense, but rather than institutional conditions and ownership structures should be a part of how researchers interpret payment-method evidence and compare findings across markets (La Porta et al., 1997).

5.3 Limitations

While the empirical design incorporates multiple complementary approaches, several limitations are important for interpreting the results. First, the thesis does not claim a fully causal interpretation of payment method effects. Payment method is an endogenous managerial choice and may correlate with unobserved deal attributes such as private information about synergies, negotiation dynamics or target quality. Matching improves comparability on observables in long-run analysis and covariate adjustment supports interpretation in the short-run setting, but unobserved selection cannot be ruled out. Consequently, the evidence is best interpreted as documenting robust associations and consistent patterns across horizons, rather than identifying the causal effect of cash versus stock financing.

Second, generalizability is bounded by the sample definition. The analysis focuses on Nordic listed acquirers, and stock-financed acquisitions represent a smaller subset of deals. While this is informative, it implies that inference about stock-financed acquisitions is based on fewer observations and that results may be more sensitive to the composition of that subset than in settings where equity payment is more prevalent. Similarly, differences in data requirements imply that the effective sample varies across empirical modules: event-study estimation requires sufficient daily return coverage around the announcement, whereas long-run analysis requires multi-year accounting coverage. These

differences are expected and transparent, but they should be kept in mind when comparing patterns across horizons.

Third, the event-study setting can be exposed to confounding corporate news and closely spaced deal announcements, especially in wider event windows. Although the thesis emphasizes standard short windows around the announcement and treats wider windows as robustness horizons, it is difficult to guarantee that no other information relevant to bidder value enters during the event window. This is a common limitation in corporate event studies and motivates interpreting the announcement results as capturing the market's contemporaneous assessment rather than a perfectly isolated pure effect of a single event.

Finally, long-run accounting and valuation measures have well-known interpretational challenges in acquisition settings. Purchase accounting, goodwill recognition, restructuring charges and the timing of synergy realization can affect measured operating performance, while valuation measures can be influenced by broader market conditions and discount-rate changes. The thesis mitigates these concerns by triangulating across multiple outcome families, but measurement limitations remain a relevant consideration when translating long-run estimates into strong claims about the success of certain acquisition.

6 Conclusion

This thesis examined how the method of payment in Nordic acquisitions relates to the market's immediate reaction at announcement and the acquirer's subsequent operating and valuation performance. The study is motivated by a large, predominantly US-centric literature that interprets stock-financed acquisitions through adverse selection and signaling mechanisms, where equity consideration can be viewed as a negative signal under information asymmetry (Myers & Majluf, 1984; Travlos, 1987). To address the limited Nordic evidence combining short-run and long-run perspectives within a unified empirical design, the thesis assembled a Nordic M&A sample and implemented a two-step strategy by combining an event study around the announcement date and a long-run analysis through rigorous regressions and propensity score matching.

The short-run evidence provides a clear answer to the first research question. Contrary to the adverse-selection narrative, stock-financed acquisitions earn higher announcement-period abnormal returns than cash-financed acquisitions in the Nordic sample. This pattern is visible in mean differences across standard event windows and remains directionally consistent when controlling for firm characteristics and fixed effects in multivariate event-window settings. The result suggests that the market indeed does not treat equity consideration as a universally negative signal at announcement and that the informational content of payment may be context dependent.

The second research question focused on whether payment method predicts long-run value creation. In the unmatched long-run regressions, cash-financed deals are associated with stronger post-deal operating performance when measured by ROA across several horizons. However, this cash advantage weakens materially once the analysis is restricted to the matched sample that balances key pre-deal covariates between cash and stock deals. In the matched sample, the ROA differential becomes smaller and largely statistically fragile, while no robust and systematic differences emerge for ROIC or Tobin's Q across horizons.

Taken together, the long-run results indicate that any broad cash-stock contrast in operating performance is sensitive to deal comparability and does not generalize across outcome metrics. This pattern seems consistent with observable selection playing a substantial role in the raw differences and cautions against interpreting raw long-run contrasts as reflecting payment method effects per se.

The third research question asked how Nordic institutional features may help interpret these findings. The combination of a positive short-run response to stock deals and attenuated long-run differences under improved comparability is consistent with the idea that the Nordic market environment may

weaken the standard adverse-selection channel commonly emphasized in the US literature. In a setting characterized by relatively high transparency and strong investor protections, equity consideration may more plausibly reflect deal design and risk-sharing rather than a dominant mechanism of overvaluation-driven issuance. At the same time, the results underline that short-run expectations need not translate into realized operating outperformance, emphasizing the value of jointly analysing announcement reactions and subsequent outcomes. While market timing and misvaluation can matter for acquisition currency choice in general, the evidence here is more consistent with selection and context-dependent signaling than with a dominant market-timing mechanism driving the cash-stock contrast in this sample (Shleifer & Vishny, 2003).

These findings have practical implications for both corporate decision-makers and investors. For Nordic bidders and boards, the results suggest that payment method should not be interpreted through a one-size-fits-all lens imported from other institutional contexts. Equity consideration is not automatically penalized at announcement in this sample and the long-run evidence provides limited support for persistent performance differences once comparability is improved. For investors, the evidence reinforces that announcement period reactions capture expectations at the time information becomes public and may not be a reliable standalone guide to long-run operating outcomes, particularly when deal selection and firm fundamentals differ systematically across different payment methods.

Several limitations qualify the interpretation. Although the analysis uses rich controls, fixed effects and PSM diagnostics to improve comparability, the results remain associational and do not establish a fully causal effect of payment method. The matched-sample inference applies to the overlap population where comparable cash and stock deals exist, and matching with replacement may concentrate control weights. Furthermore, requiring multi-year post-deal accounting coverage could induce survivorship and coverage bias if firms with delistings, restructurings or incomplete reporting are disproportionately excluded from the long-run panels. Finally, long-run performance is inherently multi-dimensional, as operating metrics and valuation metrics capture entirely different transaction mechanisms.

Overall, this thesis shows that in Nordic M&A, the informational content of payment method differs meaningfully from prior US-centrically developed expectations. Stock-financed deals are met with more favorable announcement reactions, while long-run differences across payment methods are weaker and sensitive to deal comparability. By combining event-study evidence with matched long-

run analyses, the study highlights the importance of institutional context and careful design when interpreting payment method signals and assessing acquisition performance.

References

Abadie, A., & Imbens, G. W. (2006). Large sample properties of matching estimators for average treatment effect. *Econometrica,* 74(1), 235-267.

Agrawal, A., Jaffe, J. F., & Mandelker, G. N. (1992). The post-merger performance of acquiring firms: A re-examination of an anomaly. *The Journal of Finance,* 47(4), 1605-1621.

Alexandridis, G., Fuller, K., Terhaar, L., & Travlos, N.G. (2013). Deal size, acquisition premia and shareholder gains. *Journal of Corporate Finance,* 20, 1-13.

Andrade, G., Mitchell, M., & Strafford, E. (2001). New evidence and perspectives on mergers. *Journal of Economic Perspectives,* 15(2), 103-120.

Asquith, P-. Bruner, R. F., & Mullins, D.W. (1983). The gains to bidding firms from merger. *Journal of Financial Economics*, 11(1-4), 121-139.

Baker, M., & Wurgler, J. (2002). Market timing and capital structure. *Journal of Finance,* 57(1), 1-32.

Barber, B. M., & Lyon, J. D. (1997). Detecting long-run abnormal stock returns: The empirical power and specification of test statistics. *Journal of Financial Economics,* 43(3), 341-372.

Bennedsen, M., & Nielsen, K. M. (2010). Incentive and entrenchment effects in European ownership. *Journal of Banking & Finance,* 34(9), 2212-2229.

Betton, S., Eckbo, B. E., & Thorbrn, K. S. (2008). Corporate takeovers. *Handbook of Corporate Finance: Empirical Corporate Finance* (Vol 2, pp. 291-430).

Binder, J. J. (1998). The event study methodology since 1969. *Review of Quantitative Finance and Accounting*, 11(2), 111-137.

Bradley, M., Desai, A., & Kim, E.H. (1988). Synergistic gains from corporate acquisitions and their division between the stockholders of target and acquiring firms. *Journal of Financial Economics*, 21(1), 3-40.

Brown, S. J., & Warner, J. B. (1985). Using daily stock returns: The case of event studies. *Journal of Financial Economics,* 14(1), 3-31.

Bruner, R. F. (2004). Does M&A pay? A survey of evidence for the decision-maker. *Journal of Applied Finance,* 12(1), 48–68.

Caliendo, M., & Kopeinig, S. (2008). Some practical guidance for the implementation of propensity score matching. *Journal of Economic Surveys,* 22(1), 31-72.

Campa, J. M., & Hernando, I. (2004). Shareholder value creation in European M&As. *European Financial Management,* 10(1), 47–81.

Campbell, J. Y., Lo, A. W., & MacKinlay, A. C. (1997). *The econometrics of financial markets.* Princeton University Press.

Capron, L. (1999). The long-term performance of horizontal acquisitions. *Strategic Management Journal,* 20(11), 987-1018.

Cartwright, S., & Schoenberg, R. (2006). Thirty years of mergers and acquisitions research: Recent advances and future opportunities. *British Journal of Management,* 17(S1), S1-S5.

Chung, K. H., & Pruitt, S. W. (1994). A simple approximation of Tobin's Q. *Financial Management,* 23(3), 70-74.

Cochrane, J. H. (2005). *Asset pricing.* Princeton University Press.

Corrado, C. J. (1989). A nonparametric test for abnormal security-price performance in event studies. *Journal of Financial Economics*, 23(2), 385-395.

Crump, R., Hotz, J., Imbens, G., Mitnik, O. (2009). Dealing with limited overlap in estimation of average treatment effects. *Biometrika*, 96(1). 187-199.

Damodaran, A. (2012). *Investment valuation* (3rd ed.) Wiley.

Damodaran, A. (2005). *The value of synergy.* Stern School of Business, New York University.

Daske, H., Hail, L., Leuz, C., & Verdi, R. (2008). Mandatory IFRS reporting around the world: Early evidence on the economic consequences. *Journal of Accounting Research,* 46(5), 1085-1142.

DePamphilis, D. (2018). *Mergers, acquisitions, and other restructuring activities* (9th ed.). Academic Press.

Eckbo, B. E., Giammarino, R. M., & Heinkel, R. L. (1990). Asymmetric information and the medium of exchange in takeovers: Theory and tests. *The Review of Financial Studies,* 3(4), 651-675.

European Parliament & Council of the European Union. (2002). *Regulation (EC) No 1606/2002 of the European Parliament and of the Council of 19 July 2002 on the application of international accounting standards. Official Journal of the European Communities,* L 243, 1-4.

Faccio, M., & Lang, L. H. P. (2002). The ultimate ownership of Western European corporations. *Journal of Financial Economics,* 65(3), 365-395.

Faccio, M., & Masulis, R. W. (2005). The choice of payment method in European mergers and acquisitions. *The Journal of Finance,* 60(3), 1345–1388

Fama, E. F. (1970). Efficient capital markets: A review of theory and empirical work. *The Journal of Finance,* 25(2), 383-417.

Fishman, M. J. (1989). Preemptive bidding and the role of the medium of exchange in acquisitions. *The Journal of Finance,* 44(1), 41-57.

Franks, J., Harris, R., & Mayer, C. (1988). Means of payment in takeovers: Results for the U.K. and U.S. *Corporate Takeovers: Causes and Consequences,* 221-263.

Fuller, K., Netter, J., & Stegemoller, M. (2002). What do returns to acquiring firms tell us? Evidence from firms that make many acquisitions. *The Journal of Finance,* 57(4), 1763-1793.

Garrido, M. M., Kelley, A. S., Paris, J., Roza, K., Meier, D. E., Morrison, R. S., & Aldridge, M. D. (2014). Methods for constructing and assessing propensity scores. *Health Services Research,* 49(5), 1701-1720.

Ghosh, A. (2001). Does operating performance really improve following corporate acquisitions? *Journal of Corporate Finance,* 7(2), 151–178.

Goergen, M., & Renneboog, L. (2004). Shareholder wealth effects of European domestic and cross-border takeover bids. *European Financial Management,* 10(1), 9–45.

Golubov, A., Petmezas, D., & Travlos, N. G. (2016). Do stock-financed acquisitions destroy value? New methods and evidence. *Review of Finance,* 20(1), 161-200.

Gregory, A. (1997). An examination of the long run performance of UK acquiring firms. *Journal of Business Finance & Accounting,* 24(7-8), 971-1002.

Gugler, K., Mueller, D.C., Yurtoglu, B. B., & Zulehner, C. (2003). The effects of mergers: An international comparison. *International Journal of Industrial Organization,* 21(5), 625-653.

Hansen, R. G. (1987). A theory for the choice of exchange medium in mergers and acquisitions. *The Journal of Business,* 60(1), 75-95.

Harford, J. (2005). What drives merger waves? *Journal of Financial Economics,* 77(3), 529–560.

Harford, J. (1999). Corporate cash reserves and acquisitions. *The Journal of Finance,* 54(6), 1969-1997.

Healy, P. M., Palepu, K. G., & Ruback, R. S. (1992). Does corporate performance improve after mergers? *Journal of Financial Economics,* 31(2), 135–175.

Ho, D. E., Imai, K., King, G., & Stuart, E. A. (2007). Matching as a nonparametric preprocessing for reducing model dependence in parametric causal inference. *Political Analysis,* 15(3), 199-236.

Henrekson, M., Jakobsson, U. (2011). The Swedish corporate control model: Convergence, Persistence or Decline? *Corporate Governance: An International Review,* 20(2), 212-227.

IFRS Foundation. (2024). *Use of IFRS Standards by jurisdiction: European Union.*

Imbens, G. W., & Wooldridge, J.M. (2009). Recent developments in the econometrics of program evaluation. *Journal of Economic Literature,* 47(1), 5-86.

Ismail, A., Krause, A. (2010). Determinants of the method of payment in mergers and acquisitions. *The Quarterly Review of Economics and Finance,* 50(4), 471-484.

Jensen, M. C. (1986). Agency costs of free cash flow, corporate finance, and takeovers. *American Economic Review,* 76(2), 323–329.

Jensen, M. C., & Ruback, R. S. (1983). The market for corporate control: The scientific evidence. *Journal of Financial Economics,* 11(1–4), 5–50.

King, D. R., Dalton, D. R., Daily, C. M., & Covin, J. G. (2004). Meta-analyses of post-acquisition performance: Indications of unidentified moderators. *Strategic Management Journal,* 25(2), 187–200.

King, G., & Nielsen, R. (2019). Why propensity scores should not be used for matching. *Political Analysis,* 27(4), 435-454.

Koeller, T., Goedhart, M., & Wessels, D. (2020). *Valuation: Measuring and managing the value of companies* (7th ed.). Wiley.

Kothari, S. P., & Warner, J. B. (2007). Econometrics of event studies. *Handbook of Corporate Finance: Empirical Corporate Finance* (Vol. 1, 3-36). Elsevier.

Laeven, L., & Levine, R. (2008). Complex ownership structures and corporate valuations. *The Review of Financial Studies,* 21(2), 579-604.

Lang, L. H. P., Stulz, R. M., & Walkling, R. A. (1989). Managerial performance, Tobin's Q and the gains from successful tender offers. *Journal of Financial Economics,* 24(1), 137-154.

La Porta, R., Lopez-de-Silanes, F., Shleifer, A., & Vishny, R. W. (1998). Law and finance. *Journal of Political Economy,* 106(6), 1113–1155.

Lekvall, P. (2014). *The Nordic Corporate Governance Model*. SNS Förlag.

Linn, S., Switzer, J. (2001). Are cash acquisitions associated with better postcombination operating performance than stock acquisitions? *Journal of Banking & Finance*, 25(6)*,* 1113-1138.

Liu, X., & Ma, X. (2018). Research on the correlation between payment methods of M&A and M&A performance of listed company. *International Journal of Economics and Finance,* 10(6), 90-96.

Loughran, T., & Vijh, A. M. (1997). Do long-term shareholders benefit from corporate acquisitions? *Journal of Finance,* 52(5), 1765-1790.

MacKinlay, A. C. (1997). Event studies in economics and finance. *Journal of Economic Literature,* 35(1), 13-39.

Marks, M. L., & Mirvis, P. H. (2011). A framework for the human resources role in managing culture in mergers and acquisitions. *Human Resource Management,* 50(6), 859-877.

Martynova, M., & Renneboog, L. (2008a). A century of corporate takeovers: What have we learned and where do we stand? *Journal of Banking & Finance*, 32(10), 2148-2177.

Martynova, M., & Renneboog, L. (2008b). Spillover of corporate governance standards in cross-border mergers and acquisitions. *Journal of Corporate Finance*, 14(3), 200-223.

Megginson, W. L., Morgan, A., & Nail, L. (2004). The determinants of positive long-term performance in strategic mergers: Corporate focus and cash. *Journal of Banking & Finance,* 28(3), 523-552.

Mitchell, M. L., & Strafford, E. (2000). Managerial decisions and long-term stock price performance. *The Journal of Business,* 73(3), 287-329.

Moeller, S. B., Schlingemann, F. P., & Stulz, R. M. (2004). Firm size and the gains from acquisitions. *Journal of Financial Economics,* 73(2), 201–228.

Myers, S. C., & Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics,* 13(2), 187–221.

Nenova, T. (2003). The value of corporate voting rights and control: A cross-country analysis. *Journal of Financial Economics,* 68(3), 325-351.

Perfect, S. B., & Wiles, K. W. (1994). Alternative constructions of Tobin's Q. *Journal of Empirical Finance,* 1 (3-4), 313-341.

Petersen, M. A. (2009). Estimating standard errors in finance panel sets: Comparing approaches. *Review of Financial Studies*, 22(1), 435-480.

Rau, P. & Vermaelen, T. (1998). Glamour, value and the post-acquisition performance of acquiring firms. *Journal of Financial Economics,* 49(2)*,* 223-253.

Rhodes-Kropf, M., Robinson, D. T., & Viswanathan, S. (2005). Valuation waves and merger activity: The empirical evidence. *Journal of Financial Economics,* 77(3), 561-603.

Rhodes-Kropf, M. & Viswanathan, S. (2004). Market valuation and merger waves. *The Journal of Finance,* 59(6), 2685-2718.

Rosenbaum, P. R., & Rubin, D. B. (1983). The central role of the propensity score in observational studies for causal effects. *Biometrika,* 70(1), 41-55.

Rossi, S., & Volpin, P. F. (2004). Cross-country determinants of mergers and acquisitions. *Journal of Financial Economics,* 74(2), 277–304.

Rubin, D. B. (2001). Using propensity scores to help design observational studies: Application to the tobacco litigation. *Health Services & Outcomes Research Methodology,* 2(3-4), 169-188.

Rydqvist, K. (1996). Takeover bids and the relative prices of shares that differ in their voting rights. *Journal of Banking & Finance,* 20(8), 1407-1425.

Servaes, H. (1991). Tobin's Q and the gains from takeovers. *Journal of Finance*, 46(1), 409-419.

Seth, A. (1990). Value creation in acquisitions: A re-examination of performance issues. *Strategic Management Journal,* 11(2), 99–115.

Shipman, J. E., Swanquist, Q. T., & Whited, R. L. (2017). Propensity score matching in accounting research. *The Accounting Review,* 92(1), 213-244.

Shleifer, A., & Vishny, R. W. (2003). Stock market driven acquisitions. *Journal of Financial Economics,* 70(3), 295-311.

Shleifer, A., & Vishny, R.W (1997). A survey of corporate governance. *The Journal of Finance,* 52(2), 737-783.

Strong, N. (1992). Modelling abnormal returns: A review article. *Journal of Business Finance & Accounting,* 19(4), 533-553.

Stuart, E. A. (2010). Matching methods for causal inference: A review and a look forward. *Statistical Science,* 25(1), 1-21.

Sudarsanam, S. (2010). *Creating value from mergers and acquisitions: The challenges* (2nd ed.). FT Prentice Hall.

Sudarsanam, S., & Mahate, A. (2003). Glamour acquirers, method of payment and post-acquisition performance: The UK evidence. *Journal of Business Finance & Accounting,* 30(1-2), 299-342.

Thomsen, S. (2016). The Nordic corporate governance model. *Management and Organization Review,* 12(1), 189-204.

Travlos, N. G. (1987). Corporate takeover bids, methods of payment, and bidding firms' stock returns. *The Journal of Finance,* 42(4), 943–963.

Weston, J. F., Chung, K. S., & Siu, J. A. (1998). *Takeovers, restructuring, and corporate governance* (2nd ed.). Prentice Hall.

Yung, K. (2013). Acquirer's earnings quality and the choice of payment method in mergers and acquisitions. *International Journal of Finance and Economics,* 18(4), 368-386.

Appendices

Appendix 1: Additional robustness tests in the event study framework

Two-sample t-test (difference in means)

$$t = \frac{\bar{Y}_{cash} - \bar{Y}_{stock}}{\sqrt{\frac{s^2_{cash}}{n_{cash}} + \frac{s^2_{stock}}{n_{stock}}}},$$

where $\bar{Y}$ denotes the sample mean of the outcome variable and s^2 the corresponding sample variance.

Wilcoxon rank-sum test

Pooled data are ranked increasingly; let R_i be the rank of observation i and n_c, n_s the group sizes (cash, stock). Rank-sum and U-forms (equivalent):

$$W = \sum_{i \in cash} R_i, \qquad U = n_c n_s + \frac{n_c(n_c + 1)}{2}.$$

Large-sample normal approximation:

$$Z = \frac{U - \mathbb{E}[U]}{\sqrt{Var(U)}}, \;\; \mathbb{E}[U] = \frac{n_c n_s}{2}, \;\; Var(U) = \frac{n_c n_s (n_c + n_s + 1)}{12}.$$

Permutation test

By randomly permuting group labels B times, two-sided p-value:

$$p = \frac{1 + \sum_{b=1}^{B} 1\{|T^b| \geq |T^{obs}|\}}{1 + B}.$$

Appendix 2: Stacked-window event-study specification and results

$$CARi,W = \alpha + \beta Cashi + \lambda 2DW(2) + \lambda 5DW(5) + \phi 2(Cashi \times DW(2)) + \phi 5(Cashi \times DW(5)) + \gamma' Xi,t-1 + \delta y(i) + \theta c(i) + \varepsilon i,W$$

Baseline window is [-1, +1]. Window indicators and interaction terms test whether the cash-stock difference changes in wider windows relative to the baseline. ***, ** and * denote significance at the 0.01, 0.05 and 0.10 levels.

	Coef. (SE)
Cash (treat = 1)	-0.022*
	(0.009)
Window [-2, +2]	-0.003
	(0.004)
Window [-2, +2]	-0.001
	(0.007)
Cash x Window [-2, +2]	0.003
	(0.004)
Cash x Window [-5, +5]	0.002
	(0.008)
R^2 (Within)	0.092
	(0.056)

Appendix 3: RStudio code used in the thesis

Event study

```
rm(list = ls())
# ---------- 0) Packages ----------
pkgs <-
c("readxl","dplyr","tibble","lubridate","stringr","purrr","readr")
to_install <- pkgs[!sapply(pkgs, requireNamespace, quietly = TRUE)]
if (length(to_install) > 0) install.packages(to_install)
invisible(lapply(pkgs, library, character.only = TRUE))
cat("WD:", getwd(), "\n")
# ---------- 1) Inputs ----------
file_path <- "tapahtumatutkimus uusi.xlsx"
sh_master <- "deals_master"
sh_est    <- "estimaatiodata"
sh_evt    <- "tapahtuma"
stopifnot(file.exists(file_path))
cat("OK: Found Excel:", file_path, "\n")
# ---------- 2) Read master ----------
master <- readxl::read_excel(file_path, sheet = sh_master, col_names =
TRUE)
need_cols <-
c("block_id","ticker","announce_date","treat","country","deal_year",
               "ln_size","leverage","cash_assets","mtb","roa_0")
missing_cols <- setdiff(need_cols, names(master))
if (length(missing_cols) > 0) {
  stop("Master-sheetiltä puuttuu sarakkeita: ", paste(missing_cols,
collapse=", "))}
master <- master %>%
  mutate(
    announce_date = as.Date(announce_date),
    block_id = as.integer(block_id),
    treat = as.integer(treat)  )
cat("Master rows:", nrow(master), "\n")
need_cols <-
c("block_id","ticker","announce_date","treat","country","deal_year",
               "ln_size","leverage","cash_assets","mtb","roa_0")
missing_cols <- setdiff(need_cols, names(master))
if (length(missing_cols) > 0) {
  stop("Master-sheetiltä puuttuu sarakkeita: ", paste(missing_cols,
collapse=", "))}
master <- master %>%
  mutate(
    announce_date = as.Date(announce_date),
    block_id = as.integer(block_id),
    treat = as.integer(treat))
cat("Master rows:", nrow(master), "\n")
# ---------- 3) Helpers ----------
```

```
is_tickerish <- function(x) {
  if (is.na(x)) return(FALSE)
  x <- as.character(x)
  stringr::str_detect(x, "^[A-Za-z0-9\\.\\^\\'_-]{3,}$") &&
stringr::str_detect(x, "\\.")}
as_num <- function(x) {
  if (inherits(x, "numeric")) return(x)
  if (inherits(x, "integer")) return(as.numeric(x))
  x <- as.character(x)
  x <- stringr::str_replace_all(x, ",", ".")
  suppressWarnings(as.numeric(x))}
as_date_any <- function(x) {
  if (inherits(x, "Date")) return(x)
  if (inherits(x, "POSIXct") || inherits(x, "POSIXt")) return(as.Date(x))
  if (is.numeric(x)) {
   return(as.Date(x, origin = "1899-12-30"))}
  x_chr <- as.character(x)
  x_chr <- stringr::str_trim(x_chr)
  suppressWarnings({
    x_num <- as.numeric(x_chr) })
  out <- rep(as.Date(NA), length(x_chr))
  ok_num <- !is.na(x_num) & x_num > 20000 & x_num < 60000
  out[ok_num] <- as.Date(x_num[ok_num], origin = "1899-12-30")
  idx <- is.na(out) & !is.na(x_chr) & nchar(x_chr) > 0
  if (any(idx)) {
    out[idx] <- suppressWarnings(lubridate::dmy(x_chr[idx]))
    bad <- idx & is.na(out)
    if (any(bad)) out[bad] <-
suppressWarnings(lubridate::ymd(x_chr[bad]))}
  out}
read_raw <- function(sheet) {
  raw <- readxl::read_excel(file_path, sheet = sheet, col_names = FALSE,
.name_repair = "minimal")
  cat("Parsing sheet:", sheet,
      " raw dims rows=", nrow(raw), " cols=", ncol(raw), "\n", sep = "")
  raw}
detect_block_cols <- function(raw) {
  v1 <- raw[1, ] %>% unlist(use.names = FALSE)
  which(vapply(v1, is_tickerish, logical(1)))}
parse_blocks_wide_simple <- function(raw, block_cols, max_blocks = NULL)
{
  if (length(block_cols) == 0) stop("No blocks detected.")
  if (is.null(max_blocks)) max_blocks <- length(block_cols)
  n_use <- min(length(block_cols), max_blocks)
  block_cols <- block_cols[seq_len(n_use)
  out_list <- vector("list", n_use)
  for (b in seq_len(n_use)) {
    j <- block_cols[b]
    ticker <- raw[[j]][1]
```

```
    date_raw <- raw[[j]][4:nrow(raw)]
    ret_raw  <- raw[[j+1]][4:nrow(raw)]
    mkt_raw  <- raw[[j+2]][4:nrow(raw)]
    date <- as_date_any(date_raw)
    ret  <- as_num(ret_raw)
    mkt  <- as_num(mkt_raw)
    df <- tibble(
      block_id = b,
      ticker = as.character(ticker),
      date = date,
      ret = ret,
      mkt = mkt
    ) %>%
      filter(!is.na(date))
    out_list[[b]] <- df}
  dplyr::bind_rows(out_list)
add_event_time <- function(df_long, master_df) {
  df_long %>%
    left_join(master_df %>% select(block_id, announce_date), by =
"block_id") %>%
    group_by(block_id) %>%
    arrange(date, .by_group = TRUE) %>%
    mutate(
      idx0 = {
        ad <- first(announce_date)
        if (is.na(ad)) NA_integer_ else {
          which_exact <- which(date == ad)
          if (length(which_exact) >= 1) which_exact[1] else
which.min(abs(as.numeric(date - ad)))[1]}},
      event_time = ifelse(is.na(idx0), NA_integer_, row_number() - idx0)
    ) %>%
    ungroup() %>%
    select(-idx0)}
# ---------- 4) Read raw sheets ----------
raw_est <- read_raw(sh_est)
raw_evt <- read_raw(sh_evt)
block_cols_est <- detect_block_cols(raw_est)
block_cols_evt <- detect_block_cols(raw_evt)
cat("Detected block starts (est):", length(block_cols_est), "\n")
cat("Detected block starts (evt):", length(block_cols_evt), "\n")
B <- nrow(master
if (length(block_cols_est) < B) stop("Estimation sheet blocks < master
rows. Fix sheet.")
if (length(block_cols_evt) < B) stop("Event sheet blocks < master rows.
Fix sheet.")
if (length(block_cols_est) != B) cat("NOTE: est blocks != master; using
first", B, "blocks\n")
if (length(block_cols_evt) != B) cat("NOTE: evt blocks != master; using
first", B, "blocks\n")
```

```
# ---------- 5) Parse into long ----------
est_long <- parse_blocks_wide_simple(raw_est, block_cols_est, max_blocks
= B)
evt_long <- parse_blocks_wide_simple(raw_evt, block_cols_evt, max_blocks
= B)
cat("Parsed estimation rows:", nrow(est_long), "\n")
cat("Parsed event rows     :", nrow(evt_long), "\n")
est_long <- add_event_time(est_long, master)
evt_long <- add_event_time(evt_long, master)
cat("\nEvent-time sanity (should be around -something..+something, not
thousands):\n")
print(evt_long %>% summarise(min_et = min(event_time, na.rm = TRUE),
                             max_et = max(event_time, na.rm = TRUE)))
# ---------- 6) Market model on estimation window ----------
est_for_mm <- est_long %>%
  filter(!is.na(event_time)) %>%
  filter(event_time <= -21, event_time >= -170) %>%
 filter(!is.na(ret), !is.na(mkt))
cat("\nEstimation rows used for MM:", nrow(est_for_mm), "\n")
mm_params <- est_for_mm %>%
  group_by(block_id) %>%
  summarise(
    n_est = sum(!is.na(ret) & !is.na(mkt)),
    alpha = if (n_est >= 30) coef(lm(ret ~ mkt))[1] else NA_real_,
    beta  = if (n_est >= 30) coef(lm(ret ~ mkt))[2] else NA_real_,
    .groups = "drop")
cat("Deals with estimated alpha/beta (n_est>=30):",
    sum(!is.na(mm_params$beta)), "out of", B, "\n")
# ---------- 7) Abnormal returns on EVENT data ----------
evt_ar <- evt_long %>%
  left_join(mm_params %>% select(block_id, alpha, beta), by = "block_id")
%>%
  mutate(
    ar = ifelse(is.na(alpha) | is.na(beta) | is.na(ret) | is.na(mkt),
NA_real_,
                ret - (alpha + beta*mkt)))
cat("\nEvent rows with AR:", sum(!is.na(evt_ar$ar)), "\n")
cat("Deals with any AR:",
dplyr::n_distinct(evt_ar$block_id[!is.na(evt_ar$ar)]), "\n"

master_key <- master %>%
  dplyr::distinct(block_id, .keep_all = TRUE) %>%
  dplyr::select(block_id, treat, deal_year, country,
                ln_size, leverage, cash_assets, mtb, roa_0)
# ---------- 8) CAR per window ----------
windows <- tibble::tribble(
  ~window,  ~lo,  ~hi,
  "[-1,1]",  -1,    1,
  "[-2,2]",  -2,    2,
```

```
  "[-5,5]",  -5,    5)
car_by_deal <- evt_ar %>%
  dplyr::filter(!is.na(ar), !is.na(event_time)) %>%
  tidyr::crossing(windows) %>%
  dplyr::filter(event_time >= lo, event_time <= hi) %>%
  dplyr::group_by(block_id, window) %>%
  dplyr::summarise(
    car = sum(ar, na.rm = TRUE),
    n_days = dplyr::n(),
    .groups = "drop"
  ) %>%
  dplyr::left_join(master_key, by = "block_id")
cat("\nCAR computed rows:", nrow(car_by_deal), "\n")
cat("Deals with CAR (any window):",
dplyr::n_distinct(car_by_deal$block_id[!is.na(car_by_deal$car)]), "\n")
stopifnot("treat" %in% names(car_by_deal)
stopifnot(all(c("block_id","treat","deal_year","country","firm_id",
                "ln_size","leverage","cash_assets","mtb","roa_0") %in%
names(master)))
if (!("treat" %in% names(car_by_deal))) {
  car_by_deal <- car_by_deal %>%
    dplyr::left_join(
      master %>%
        dplyr::select(block_id, treat, deal_year, country, firm_id,
                      ln_size, leverage, cash_assets, mtb, roa_0),
      by = "block_id")}
if (!("treat" %in% names(car_by_deal))) stop("treat still missing from
car_by_deal after join")
if (all(is.na(car_by_deal$treat))) stop("treat is present but all NA ->
block_id join mismatch")
car_by_deal <- car_by_deal %>%
  dplyr::mutate(treat = as.integer(treat))
# ---------- 9) CAAR + tests ----------
caar_summary <- car_by_deal %>%
  filter(!is.na(car)) %>%
  group_by(window, treat) %>%
  summarise(
    n = n(),
    caar = mean(car),
    sd = sd(car),
    t_stat = caar / (sd/sqrt(n)),
    p_one_sample = 2*pt(-abs(t_stat), df = n-1),
    .groups = "drop"
  )
cat("\nCAAR summary:\n")
print(caar_summary)
diff_tests <- car_by_deal %>%
  filter(!is.na(car)) %>%
  group_by(window) %>%
```

```
  summarise(
    mean_cash  = mean(car[treat == 1], na.rm = TRUE),
    mean_stock = mean(car[treat == 0], na.rm = TRUE),
    mean_diff  = mean_cash - mean_stock,
    p_ttest = tryCatch(t.test(car[treat==1], car[treat==0])$p.value,
error=function(e) NA_real_),
    p_wilcox = tryCatch(wilcox.test(car[treat==1],
car[treat==0])$p.value, error=function(e) NA_real_),
    .groups = "drop"
  )
cat("\nDiff tests (cash-stock):\n")
print(diff_tests)
perm_p <- function(x_cash, x_stock, B = 5000, seed = 1) {
  set.seed(seed)
  x <- c(x_cash, x_stock)
  g <- c(rep(1, length(x_cash)), rep(0, length(x_stock)))
  obs <- mean(x_cash) - mean(x_stock)
  diffs <- replicate(B, {
    gp <- sample(g)
    mean(x[gp==1]) - mean(x[gp==0])
  })
  mean(abs(diffs) >= abs(obs))
}
perm_tbl <- car_by_deal %>%
  filter(!is.na(car)) %>%
  group_by(window) %>%
  summarise(
    p_perm = tryCatch(
      perm_p(car[treat==1], car[treat==0], B = 5000, seed = 1),
      error = function(e) NA_real_
    ),
    .groups = "drop"
  )
diff_tests <- diff_tests %>% left_join(perm_tbl, by = "window")
cat("\nDiff tests + permutation:\n")
print(diff_tests)
# ---------- 10) Save outputs ----------
out_dir <- getwd()
readr::write_csv(mm_params, file.path(out_dir,
"market_model_params.csv"))
readr::write_csv(est_long,  file.path(out_dir, "estimation_long.csv"))
readr::write_csv(evt_long,  file.path(out_dir, "event_long.csv"))
readr::write_csv(evt_ar,    file.path(out_dir, "ar_event_long.csv"))
readr::write_csv(car_by_deal, file.path(out_dir, "car_by_deal.csv"))
readr::write_csv(caar_summary, file.path(out_dir, "caar_summary.csv"))
readr::write_csv(diff_tests, file.path(out_dir, "caar_tests.csv"))
cat("\nDONE. Files saved to:\n", out_dir, "\n", sep="")
```

```
cat(" - market_model_params.csv\n - estimation_long.csv\n -
event_long.csv\n - ar_event_long.csv\n - car_by_deal.csv\n -
caar_summary.csv\n - caar_tests.csv\n")
# 0) Working directory (same folder where car_by_deal.csv is)
try({
  this_file <- normalizePath(rstudioapi::getActiveDocumentContext()$path,
winslash = "/", mustWork = FALSE)
  if (nzchar(this_file)) setwd(dirname(this_file))
}, silent = TRUE)
cat("WD:", getwd(), "\n")
# 1) Packages
pkgs <- c("readr", "dplyr", "stringr", "fixest")
for (p in pkgs) {
  if (!requireNamespace(p, quietly = TRUE)) install.packages(p)}
library(readr)
library(dplyr)
library(stringr)
library(fixest)
# 2) Read CAR-by-deal data
if (!file.exists("car_by_deal.csv")) {
  stop("car_by_deal.csv not found in WD. Put this script in the same
folder or setwd() correctly.")}
car <- read_csv("car_by_deal.csv", show_col_types = FALSE)
cat("Loaded car_by_deal.csv: rows=", nrow(car), " cols=", ncol(car),
"\n")

# 3) Basic hygiene / required columns
need <- c("block_id", "window", "car", "treat", "deal_year", "country")
missing <- setdiff(need, names(car))
if (length(missing) > 0) stop("Missing columns in car_by_deal.csv: ",
paste(missing, collapse = ", "))
car <- car %>%
  mutate(
    window    = as.character(window),
    treat     = as.integer(treat),
    deal_year = as.integer(deal_year),
    country   = as.factor(country))
candidate_controls <- c("ln_size", "leverage", "cash_assets", "mtb",
"roa_0")
controls_present <- intersect(candidate_controls, names(car))
cat("Controls present:", ifelse(length(controls_present)==0, "(none)",
paste(controls_present, collapse=", ")), "\n")
cluster_var <- if ("ticker" %in% names(car)) "ticker" else "block_id"
cat("Clustering by:", cluster_var, "\n")
# 4) (Recommended) “strict” window completeness filter
if ("n_days" %in% names(car)) {
  car <- car %>%
    mutate(req_days = case_when(
      window == "[-1,1]" ~ 3L,
```

```
      window == "[-2,2]" ~ 5L,
      window == "[-5,5]" ~ 11L,
      TRUE ~ NA_integer_
    )) %>%
    filter(is.na(req_days) | n_days >= req_days)
  cat("After strict window filter (n_days): rows=", nrow(car), "\n")}
# 5) Regression formula strings
rhs <- paste(c("treat", controls_present), collapse = " + ")
fml <- as.formula(paste0("car ~ ", rhs, " | deal_year + country"))
cat("\nRegression formula (per window):\n")
cat(deparse(fml), "\n\n")
# 6) Run regressions separately per window
windows <- c("[-1,1]", "[-2,2]", "[-5,5]")
mods <- list()
for (w in windows) {
  dfw <- car %>% filter(window == w) %>% filter(!is.na(car),
!is.na(treat))
  cat("Window", w, " rows:", nrow(dfw), "\n")
  if (nrow(dfw) < 30) {
    cat("  -> Too few rows, skipping.\n")
    next }
  mods[[w]] <- feols(
    fml,
    data = dfw,
    cluster = as.formula(paste0("~", cluster_var)))}
# 7) Pooled regression with treat×window interactions
cat("\n============================\n")
cat("POOLED (treat × window) REGRESSION\n")
cat("============================\n\n")
car_pooled <- car %>%
  filter(window %in% windows) %>%
  mutate(window = factor(window, levels = windows))
rhs_pool <- paste(c("treat*window", controls_present), collapse = " + ")
fml_pool <- as.formula(paste0("car ~ ", rhs_pool, " | deal_year +
country"))
mod_pool <- feols(
  fml_pool,
  data = car_pooled,
  cluster = as.formula(paste0("~", cluster_var)))
print(etable(mod_pool, se.below = TRUE))
```

Long-term analysis and PSM

```
# 2) Kovariaatit
psm_x <- c("ln_size", "leverage", "cash_assets", "mtb", "roa_0",
"roic_0", "tobin_q_0")
reg_x_common <- c("ln_size", "leverage", "cash_assets", "mtb")
outcome_map <- list(
```

```
  ROA    = c("roa_1",    "roa_2",    "roa_3"),
  ROIC   = c("roic_1",   "roic_2",   "roic_3"),
  TobinQ = c("tobin_q_1","tobin_q_2","tobin_q_3"))
baseline_map <- c(ROA = "roa_0", ROIC = "roic_0", TobinQ = "tobin_q_0")
need_vars <- unique(c("deal_id","firm_id","deal_year","treat", psm_x,
reg_x_common, unlist(outcome_map)))
missing_vars <- setdiff(need_vars, names(df))
if (length(missing_vars) > 0) stop(paste("Puuttuvat sarakkeet datasta:",
paste(missing_vars, collapse = ", ")))
df_ps <- df |>
  filter(!is.na(deal_year)) |>
  filter(if_all(all_of(psm_x), ~ !is.na(.)))
cat("\n====================\nPSM pre-check\n====================\n")
cat("N (PSM complete cases):", nrow(df_ps), "\n")
cat("Treated (cash=1):", sum(df_ps$treat == 1), "\n")
cat("Control (stock=0):", sum(df_ps$treat == 0), "\n")
ps_formula <- as.formula(paste0("treat ~ ", paste(psm_x, collapse = " +
")))
m_out <- matchit(
  formula  = ps_formula,
  data     = df_ps,
  method   = "nearest",
  distance = "logit",
  ratio    = 1,
  replace  = TRUE,
  caliper  = 0.2,
  exact    = ~ deal_year)
df_m <- match.data(m_out)
# 5) Matchausdiagnoosit
cat("\n====================\nMATCHIT SUMMARY\n====================\n")
print(summary(m_out, standardize = TRUE))
cat("\n====================\nMATCHED SAMPLE
SIZES\n====================\n")
cat("Matched N:", nrow(df_m), "\n")
cat("Matched treated:", sum(df_m$treat == 1), "\n")
cat("Matched control:", sum(df_m$treat == 0), "\n")
cat("\n====================\nWEIGHTS (matched
data)\n====================\n")
print(summary(df_m$weights))
dropped <- df_ps |>
  mutate(in_matched = deal_id %in% df_m$deal_id) |>
  filter(!in_matched)
cat("\n====================\nDROPPED (not in
matched)\n====================\n")
cat("Dropped N:", nrow(dropped), "\n")
print(table(dropped$treat))
cat("\nDropped by deal_year x treat:\n")
print(table(dropped$deal_year, dropped$treat))
# 6) Balanssi (SMD) + love plot + PS-overlap kuvat
```

```
cat("\n====================\nBALANCE TABLE
(cobalt)\n====================\n")
bal <- bal.tab(m_out, un = TRUE, m.threshold = 0.1, disp.v.ratio = TRUE)
print(bal)
cat("\nAukeaa nyt love plot -kuvio (SMD ennen/jälkeen).\n")
love.plot(
  m_out,
  stats = "mean.diffs",
  abs = TRUE,
  threshold = 0.1,
  var.order = "unadjusted")
cat("\nAukeaa nyt PS-overlap kuvat (hist & jitter).\n")
plot(m_out, type = "hist")
# 7) Regressiot: funktio (raw ja matched)
reg_formula <- function(y, baseline_var) {
  rhs <- paste(c("treat", reg_x_common, baseline_var), collapse = " + ")
  as.formula(paste0(y, " ~ ", rhs, " | deal_year"))}
run_models <- function(data, use_weights = FALSE) {
  models <- list()
  for (metric in names(outcome_map)) {
    ys <- outcome_map[[metric]]
    base <- baseline_map[[metric]]
    for (h in 1:3) {
      y <- ys[h]
      nm <- paste0(metric, "_t+", h)
      need <- unique(c(y, "treat", "deal_year", "firm_id", reg_x_common,
base))
      dsub <- data |>
        filter(if_all(all_of(need), ~ !is.na(.)))
      if (use_weights) {
        models[[nm]] <- feols(
          reg_formula(y, base),
          data = dsub,
          weights = ~ weights,
          cluster = ~ firm_id)
      } else {
        models[[nm]] <- feols(
          reg_formula(y, base),
          data = dsub,
          cluster = ~ firm_id)}}}
  models}
```

Appendix 3: AI tools use documentation

AI-tools were utilized to help structure sections and clarify wording, suggest alternative formulations and improve readability and in support with debugging and organizing R code.

All empirical results in the thesis are based on the author's own data collection, coding and estimation. AI tools were not used to generate data, fabricate outputs or draw any conclusions independently. Statistical analyses were executed by the author in R and all reported numbers, tables and figures originate from the author's own program output. The author reviewed and verified all AI-suggested code and text edits before inclusion.