Elia Palomaa

Post M&A stock performance

Event study of US based companies in the technology sector

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Author: Elia Palomaa
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ABSTRACT:

Yritysostojen vaikutusta ostavien yritysten osakekursseihin on tutkittu rahoitustieteessä runsaasti, erityisesti sen kannalta, miten markkinat reagoivat julkistamishetkellä lyhyellä aikavälillä. Silti on edelleen avoin kysymys, miten rahoitusmarkkinat suhtautuvat yritysostoihin nimenomaan ostajan näkökulmasta. Tämä tutkimus tarkastelee miten yritysostosta ilmoittaminen vaikuttaa teknologiayhtiöiden osakkeiden lyhyen aikavälin tuottoihin.

Tutkimuksen teoreettinen perusta rakentuu markkinoiden tehokkuuden teorian ja tapahtumatutkimuskirjallisuuden varaan. Kirjallisuuskatsaus käy läpi aiemman tutkimuksen keskeisiä havaintoja yritysostojen markkinavaikutuksista sekä finanssikriisin jälkeistä yritysostokehitystä teknologiasektorilla. Lisäksi tarkastellaan teoreettisia selitysmalleja osakemarkkinoiden reaktioille sekä empiiristä näyttöä yritysostojen julkistamisvaikutuksista. Näiden pohjalta muodostetaan kaksi tutkimushypoteesia: 1. Teknologiasektorin yritysostojen julkistaminen tuottaa positiivisia kumulatiivisia epänormaaleja tuottoja ostaville yrityksille 2. Käteisellä rahoitetut yritysostot tuottavat korkeampia kumulatiivisia epänormaaleja tuottoja kuin osakevaihtona toteutetut ostot.

Tutkimusmenetelmänä käytetään tapahtumatutkimusta, jossa julkistamisen aiheuttamaa markkinavaikutusta mitataan vertaamalla toteutuneita tuottoja odotettuihin tuottoihin ennalta määritellyissä tapahtumaikkunoissa. Odotetut tuotot estimoidaan markkinamallin avulla S&P 500 -indeksiin nähden, minkä jälkeen epänormaalit tuotot (abnormal returns) ja kumulatiiviset epänormaalit tuotot (cumulative abnormal returns) lasketaan useille tapahtumaikkunoille.

Empiirinen analyysi kattaa yhteensä 15 yritysostoa kolmelta suurelta teknologiayhtiöltä: Microsoftilta (MSFT), Oraclelta (ORCL) ja Alphabetilta (GOOGL). Microsoftin tapaukset sisältävät muun muassa LinkedInin, Skypen ja GitHubin hankinnat. Oraclen aineistossa tarkastellaan RightNow Technologiesin, Taleon ja NetSuiten kaltaisia ostoja. Alphabetin osalta analyysi kattaa esimerkiksi Motorolan, Wazen ja Nest Labsin hankinnat. Yritysostoaineisto on kerätty Orbis-tietokannasta ja kurssidata Stooq-tietokannasta.

Tulokset osoittavat, että markkinoiden reaktiot vaihtelevat tapauskohtaisesti ja heijastavat sijoittajien yksilöllisiä arvioita kustakin ostosta. Käteisellä ja osakkeilla rahoitettuihin yritysostoihin reagoidaan eri tavoin, mikä viittaa siihen, että rahoitusrakenne vaikuttaa sijoittajien tulkintoihin yritysoston taloudellisesta merkityksestä. Kokonaisuutena tulokset eivät kuitenkaan tue yhtenäistä markkinavastetta teknologiasektorin yritysostoille.

KEYWORDS: Mergers, Acquisitions, Stock, Technology, Event Study, Performance, CAR

Contents

1 Background, motivation and contribution

This section covers the background for the study, the motivation for the study and also the aimed contribution of the study.

1.1 Background

Mergers and acquisitions represent one of the most important strategic instruments through which firms restructure their operations, reallocate capital and pursue growth opportunities. In capital markets, acquisition announcements are also among the most closely scrutinized corporate events, as they convey new information about managerial strategy, expected synergies and the future trajectory of the firm. As a result, the stock-market reaction to merger and acquisition announcements has long served as a central empirical testing ground for theories of corporate investment, market efficiency and managerial behavior.

"A merger is the combination of two already-existing, independent businesses to create a single, new legal entity. It's a voluntary arrangement between businesses with comparable size and scope that aims to boost market share, decrease rivalry, launch new goods or services, enhance operations and boost revenue. Cash, equity or a combination of the two can be used to finance mergers, with each business's shareholders obtaining ownership in the combined company. Buying and taking control of another company through the purchase of its shares or assets is known as an acquisition in business. This procedure is the basis of mergers and acquisitions (M&A), which entail the purchasing, selling and merging of businesses to accomplish strategic goals" (Kumari et. al., 2025).

A large body of empirical literature has examined the shareholder wealth effects of mergers and acquisitions, with relatively consistent evidence that target firm shareholders benefit substantially from takeover announcements. Acquiring firm shareholders on average, earn small or statistically insignificant abnormal returns. In some settings, in large and mature firms, acquirer returns have even been found to be negative. This suggesting that acquisitions may be driven by managerial incentives, overconfidence or agency problems rather than by pure value creation. At the same

time, other studies note that average effects conceal substantial heterogeneity across firms, industries and deal types. This would indicate that the value implications of acquisitions depend critically on context.

The technology sector provides a interesting environment in which to re-examine these issues. Unlike traditional asset intensive industries, technology firms derive a large share of their value from intangible assets such as software, data, intellectual property and human capital (Corrado et. al., 2009). That said it could make it genuinely harder to value acquisition targets or get a clear read on potential synergies. In the technology sector it is shown that competing means rapid innovation cycles and strong network effects. There is a "winner takes most" type of dynamic. All of these can sharply boost both the rewards and the risks that come with growing through acquisitions.

Since the global financial crisis, large U.S. technology companies have gone through a remarkable period of growth and M&A activity has risen steadily alongside it. Companies like Microsoft, Alphabet (Google) and Oracle have made acquisitions a core part of their strategy. Central to this strategy is to strenghten their platform ecosystems or broaden their product offerings. These can also be known as some of the most closely watched companies by experts, meaning their acquisition announcements tend to get picked up and priced in by financial markets very quickly.

Most of what we know about M&A performance comes from studies that cast a wide net across industries, without paying much attention to the biggest tech companies or to how the landscape has shifted since the financial crisis. That leaves an open question: do the usual findings about how acquirers fare actually hold up for dominant tech firms, where the logic of competition is driven by innovation rather than traditional market dynamics?

Figuring out how markets respond when these companies make acquisitions matters beyond just academic interest. Investors, executives and anyone curious about whether

capital markets are accurately pricing major strategic bets in today's tech economy all have a stake in the answer.

1.2 Motivation

The motivation for this study comes from both a basic economic question and a gap in the empirical literature on mergers and acquisitions. Mergers and acquisitions remain one of the main ways firms try to create value, expand their activities and gain access to new technologies. At the same time the evidence on whether these transactions benefit acquiring shareholders is mixed. Many earlier studies show that acquiring firms often earn small, zero or even negative abnormal returns around announcement dates. This creates an important question about why firms still rely so strongly on acquisitions as a key growth strategy.

The question becomes even more relevant in the technology sector. Over the past decade large technology firms have built up exceptional financial resources and strong market positions. During the same period they have also become some of the most active acquirers in the global economy. Microsoft, Alphabet and Oracle have targeted many different types of assets including software firms, cloud services, data platforms and specialized technology providers. Usually these kind of deals are seen as upgrading company ecosystems and trying to secure positions in new technological areas. It might not always be clear from the perspective of outside investors however if these strategic goals lead to measurable value creation.

A further motivation for this study comes from the fact that much of the existing empirical evidence on M&A performance relies on broad samples that combine firms from very different industries, time periods and institutional settings. These studies are useful for identifying general patterns. However they can also hide important differences in how markets respond to acquisitions in specific sectors or when the acquiring firms

share similar characteristics. In this sense a more focused approach can help provide clearer evidence on how investors evaluate acquisitions in the technology sector
The technology sector, with its heavy reliance on intangible assets and its high degree of uncertainty regarding future growth opportunities (Dong, 2025), represents a interesting case in which standard results may not apply in a straightforward manner.

From a methodological perspective, the post-financial crisis period offers a clean and economically meaningful setting in which to examine market reactions to acquisitions by these technology firms. This period is know by relatively high market transparency, intense analyst coverage and rapid information diffusion, especially for large, widely held firms such as Microsoft, Alphabet and Oracle. As a result the short-horizon stock-market reactions to acquisition announcements can be interpreted as reflecting investors' assessments of the expected value changes of these transactions.

Finally, this study is motivated by the desire to move beyond documenting average announcement effects and toward explaining heterogeneity in market reactions. By focusing on a small number of major technology acquirers and by using event-study, the thesis tries to find out whether differences in firm characteristics and deal attributes help explain why some acquisitions are greeted positively by the market while others are not. In this way, the study seeks to contribute to a more complex understanding of how financial markets evaluate acquisition strategies in the modern technology sector.

1.3 Contribution and structure of the thesis

This thesis aims to contribute to the empirical literature on mergers and acquisitions by offering a focused and transparent analysis of how financial markets react to acquisition announcements made by technology firms in the post-financial crisis period. While mergers and acquisitions have been studied extensively for several decades, the empirical evidence remains surprisingly mixed, especially from the perspective of acquiring shareholders. In many studies based on broad samples, acquirers earn little or no abnormal returns at the time of announcement and in some cases even experience

negative reactions. At the same time, firms continue to spend enormous amounts of capital on acquisitions, in the technology sector. The fact that firms generate weak stock reaction results and still are active in acquisitions forms some background on why this thesis was made.

A key contribution of this study is the decision to focus on a small and clearly defined group of firms. Rather than relying on large cross-industry samples that combine very different companies and time periods, the analysis examines only three major U.S. technology firms: Microsoft, Alphabet and Oracle. These companies have played a central role in acquisition activity within the sector and they are also among the most closely monitored firms in global stock markets. Because their shares are actively traded and widely followed, new information from acquisition announcements is seen quickly in prices. This makes the observed market reactions easier to interpret as investors' evaluations of the transactions.

Another contribution of the thesis is its focus on the period after the financial crisis in 2009 and before 2019. This time period was a quite ideal economic environment compared with earlier decades. Interest rates remained low, equity markets performed strongly and large technology firms expanded rapidly. During this time these companies made more acquisitions and often bought smaller technology companies, software developers and platform based businesses. By limiting the analysis to this period reduces the risk that the results migh be affected by crisis related disturbances in financial markets. The study tries to examine investor reactions in a more stable setting, which makes the findings easier to interpret.

From a methodological perspective, the thesis contributes by applying standard and widely accepted event-study techniques in a careful and transparent manner. Expected returns are estimated using established asset-pricing models over a pre-event estimation window and abnormal returns are computed over short event windows around the announcement date in order to isolate the immediate market reaction to

the new information. The analysis stays close to the core idea of event studies that stock prices reflect investors' expectations and interpretations at the moment when new information becomes public by focusing on short windows.

The thesis also examines the factors that help explain why investor reactions differ from one acquisition to another. This is done through cross sectional regression analysis with particular attention given to the method of payment. The study separates cash financed acquisitions from those financed with stock because earlier research has suggested that financing choices may signal information about firm valuation and perceived uncertainty. By testing whether investors respond more positively to cash financed transactions than to stock financed ones the thesis can contribute its results to the broader discussion that already exists in the M&A literature.

It is also important to clarify what this thesis sets out to examine and what remains outside its scope. The study does not try to measure the long term operational success of acquisitions and it does not try to estimate the causal effect of M&A activity on firm value in a structural sense. Instead the focus is narrower and more specific. The analysis looks at how stock markets respond when acquisition announcements become public and treats these reactions as indicators of investor expectations about the potential value of the transactions. The focus is therefore on how investors interpret acquisitions at the time they are announced rather than on whether the expected benefits are later realized in practice.

Beyond its academic relevance, the thesis also has practical significance. For investors, it provides evidence on how markets typically respond to acquisition announcements by some of the most important technology firms in the world and on whether certain types of deals are systematically viewed more positively than others. For some the results offer insight into how strategic decisions and financing choices are perceived by outside shareholders.

The structure of the thesis is organized as follows. Chapter 1 introduces the background of the study, explains its motivation and outlines the research objectives. Chapter 2

presents the theoretical and empirical background by reviewing prior literature on mergers and acquisitions, developments in technology-sector M&A activity after the global financial crisis. It also covers theoretical explanations for stock market reactions to acquisition announcements. The chapter concludes with the formulation of the research hypothesis.

Chapter 3 describes the methodology applied in the empirical analysis, including the event study framework, estimation procedures and the selection of acquisitions included in the sample. Chapter 4 presents the calculated cumulative abnormal returns and corresponding t-statistics. Chapter 5 reports the empirical results. The announcement effects are examined separately for Microsoft, Oracle and Alphabet acquisitions. Followed after that by a comparison between cash financed and stock financed transactions and an overall statistical evaluation of the results. Finally, Chapter 6 summarizes the main findings and presents the conclusions of the study.

This thesis addresses two main research questions:

1.3.1 RQ1: Do M&A announcements by large U.S. technology firms generate positive abnormal returns?

1.3.2 RQ2: Does the method of payment affect market reactions?

2 Theoretical and empirical background

Mergers and acquisitions have played a central role in corporate strategy and capital allocation. Firms use acquisitions to expand into new markets, acquire technologies or capabilities, achieve economies of scale or scope and strengthen their competitive positions. Acquisitions play a important role in the technology sector. Large technology firms often use them to gain access to intangible resources such as software, data, intellectual property and specialized human capital. These kinds of assets are not easy to develop internally and their value can be difficult to estimate in advance. For this reason acquisitions have become a practical way for technology companies to adjust to rapid technological change and shifting competitive conditions.

After the global financial crisis acquisitions became an even more central part of strategy in the technology sector. Large U.S. technology firms built up strong financial positions and began to rely more heavily on acquisitions as a way to support growth and adjust their strategic direction. Because of these developments the post financial crisis period gives a clear and relevant setting for examining how financial markets respond to acquisition decisions made by leading technology firms.

From a theoretical perspective there are several different explanations for why mergers and acquisitions may increase or reduce value for acquiring shareholders. One of the most established views is the synergy hypothesis. According to this idea acquisitions create value when the combined company can operate more efficiently than the firms could on their own (Corning, 1998). These gains may come from lower costs, higher revenues, stronger market positions or a better use of resources. In technology companies synergies are often linked to expanding digital platforms or connecting software ecosystems or combining technological capabilities across firms.

Another explanation is the role of agency problems and managerial incentives. From this perspective managers may choose to pursue acquisitions even when they do not clearly increase shareholder value (Jensen and Meckling, 1976). For example acquisitions can

be used to expand the size of the firm or to strengthen managers' own position within the organization. In such cases the motivation behind the deal may be empire building or managerial overconfidence rather than genuine value creation. This view also helps explain why many empirical studies find that acquiring firms often do not earn strong positive abnormal returns around acquisition announcements.

A third explanation is linked to information asymmetry and signaling in financial markets. In this view the method used to finance an acquisition can affect how investors interpret the deal. When a transaction is financed with stock it may suggest that managers consider the firm's shares to be relatively highly valued. In contrast cash financed acquisitions are often seen as a stronger signal that management expects the deal to create value. This reasoning is relevant in the technology sector where uncertainty about firm valuation is often high and equity based financing is widely used.

These theoretical perspectives are closely linked to the efficient market hypothesis, which underlies most event-study analyses of mergers and acquisitions. If capital markets are at least semi-strong form efficient, stock prices should incorporate new publicly available information quickly (Fama, 1970). Under this assumption, the stock-price reaction around an acquisition announcement reflects investors' collective assessment of the expected value implications of the transaction. A positive abnormal return indicates that the market expects the acquisition to create value for the acquirer's shareholders, while a negative abnormal return suggests the opposite.

A large literature has examined the stock-market effects of mergers and acquisitions empirically. One of the most robust findings is that target firm shareholders gain substantially from takeover announcements, while acquiring firm shareholders, on average, earn small, zero or slightly negative abnormal returns (Andrade et. al., 2001). At the same time these average effects hide substantial variation across firms, time periods and deal characteristics. Some acquisitions are greeted very positively by the market, while others trigger clearly negative reactions.

Several empirical regularities are relevant for the present study. First, there is strong evidence that the method of payment matters. Cash financed acquisitions tend to be associated with higher announcement-period returns for acquirers than stock-financed acquisitions. This pattern is consistent with the information-asymmetry and signaling interpretation discussed above. Secondly market reactions differ across industries and types of firms. This suggesting that the economic context in which acquisitions take place plays an important role in shaping investor expectations.

Despite the size of the existing literature, relatively few studies focus specifically on the largest technology firms in the post-financial-crisis period. This is a notable gap, given both the economic importance of these firms and the distinctive features of the technology sector. The high importance of intangible assets, the role of platforms and ecosystems and the rapid pace of technological change all make it less obvious that the standard conclusions from broad cross-industry samples should apply in the same way to dominant technology firms.

For these reasons, a focused empirical analysis of acquisitions by Microsoft, Alphabet and Oracle during the period 2009-2019 give a useful and economically meaningful contribution. By examining how the stock market reacts to these firms' acquisition announcements, it becomes possible to assess whether investors systematically view such transactions as value creating or value destroying. Also whether important deal characteristics, such as the method of payment, help explain differences in market reactions.

On the basis of these theoretical arguments and empirical regularities, the following chapter presents the empirical analysis of previous literature. The empirical analysis uses standard event-study methodology to evaluate these studies in a transparent and replicable manner. Lastly the following chapter develops the specific hypotheses tested in this thesis based on these arguments and previous literature.

2.1 Previous studies

The following chapter reviews previous empirical studies examining stock market reactions to merger and acquisition announcements. Particular attention is given to research that applies event study methodology to acquiring firms, as these approaches form the methodological foundation of this thesis.

The empirical literature on mergers and acquisitions has evolved considerably over the past few decades. Early studies focused mainly on documenting average announcement returns, but researchers have began asking deeper questions. Why do some acquisitions create value while others destroy it? And do short term market reactions actually tell us anything meaningful about long term outcomes? One widely accepted finding has proven extremely consistent across the literature: target shareholders tend to do well from takeover announcements but at the same time acquiring firm shareholders earn smaller, weaker or sometimes negative returns.

Martynova and Renneboog (2008) provide further support for this pattern in their review of about 65 announcement return studies covering more than a century of merger waves. Their results show that acquisition activity often appears in waves that are usually linked to periods of economic growth, regulatory changes and technological development. At times managerial overconfidence and herding behavior also seem to influence firms to engage in acquisitions that later reduce rather than create value. The authors also point out that these patterns appear across very different time periods and institutional settings, which suggests that the difference between target firm returns and acquirer returns is a persistent feature of merger activity.

Several studies have tried to explain why some acquirers do better than others. Servaes (1991) shows that before the acquisition firm quality matters. Using a sample of 704 completed takeovers between 1972 and 1987, including 384 identifiable bidders, he measures firm quality using Tobin's Q and classifies firms into high- and low-Q groups. The results show the highest gains occur when high-Q bidders acquire low-Q targets.

This supports the idea that acquisitions can function as a way to move assets toward firms that are able to use them more effectively. When the situation is reversed and lower-Q bidders acquire higher-Q targets the results are clearly weaker. High-Q targets also tend to earn smaller abnormal returns themselves which likely reflects the more limited scope for restructuring and performance improvements.

Fuller, Netter and Stegemoller (2002) show that the type of target matters just as much as firm quality. They look at frequent acquirers in the U.S. between 1990 and 2000, defined as firms completing at least five acquisitions within three years. The findings are that buying public firms generate negative reactions of around −1,00 percent on average. Acquiring private firms or subsidiaries produces positive abnormal returns of about +2,08 percent and +2,75 percent. The overall average CAR across all deal types comes in at about +1,77 percent. It is worth noting that the result consists of significant variation depending on who is being acquired. The results from both studies are the same, acquirer returns are not random. They reflect specific characteristics of the deal and the firms involved.

The method of payment turns out to be important. Rau and Vermaelen (1998) study over 3,500 mergers and tender offers completed between 1980 and 1991. They then classify bidders as either value or glamour firms based on their book to market ratios. Rather than relying on traditional long horizon cumulative abnormal returns, they benchmark performance against size- and book to market-matched portfolios. This ways helps to address some of the known limitations of beta-based models. They also use bootstrapping techniques to improve the reliability of their statistical inference. The results show that glamour acquirers using stock financing experience long run returns as low as −17 percent, while value acquirers fare considerably better, earning abnormal returns of about 8 percent in mergers and 16 percent in tender offers.

Loughran and Vijh (1997) reach similar conclusions from a longer horizon. Their sample covers 947 acquisitions between 1970 and 1989 and they measure long run performance

using five year buy and hold -abnormal returns benchmarked against firms matched by size and book to market ratios. Stock financed mergers produce five year median returns ranging from approximately −17,2 percent to −28,3 percent, while cash financed deals hold up considerably better over the same horizon. Both of these studies suggest that markets tend to respond more negatively to stock financed deals. This fits well with the signaling logic discussed later in Section 2.3.

Two further studies are worth to discuss about the methodology. Cornett, Tanyeri and Tehranian (2011) show that treating every acquisition announcement as a complete surprise can distort the results. Some deals are somewhat anticipated before they are officially announced and failing to account for this mixes abnormal return estimates. The authors address this by using a two staged econometric model, where a multinomial logit model first estimates the probability that a firm becomes an acquirer.

They use characteristics such as size, profitability, growth opportunities and prior acquisition activity. These probabilities serve as a “proxy” for investor expectations. Cumulative abnormal returns are then estimated using a surprise variable that captures how unexpected the announcement actually was. They find that truly unexpected acquisitions generate much stronger market reactions than deals the market had already begun to price in. Another finding was that bidder actions are generally more predictable than target selection.

Cosh, Guest and Hughes (2006) raise a different but an important point that short term market reactions and long run operating performance do not always give the same result. In their study study they evaluates both cumulative abnormal returns over a three day announcement window and 36 month buy and hold returns matched by industry and profitability. Six accounting based performance indicators covering profit and cash flow measures are used. The results show that acquisition outcomes vary widely across firms and that short term market reactions reflect immediate expectations rather than

realized outcomes. The same acquisition can look very different depending on what is being measured and when.

2.2 M&A activity in the technology sector after the financial crisis

The global financial crisis was a big turning point in financial markets and also in corporate investment behavior and strategic decision making. Many firms reduced capital spending and delayed major strategic transactions after the crisis. Markets slowly stabilized and monetary policy remained highly supportive for a long period, which led to change in the conditions for corporate acquisitions. By the early 2010s several large technology firms were in a strong financial position with high profitability, substantial cash reserves and few financing constraints. These developments created an important background for understanding why mergers and acquisitions became such a central strategic tool in the technology sector during the post crisis period.

Merger and acquisition activity tends to occur in waves that are closely related to economic conditions and financial market valuations. Gaughan (2018) explains that periods of strong equity markets and a lot of liquidity have repeatedly coincided with surges in acquisition activity. At the same time firms find it easier and cheaper to finance transactions and managers become more confident in pursuing ambitious growth strategies. The time period after the financial crisis fits this pattern well. After many years of recovery, large technology firms benefited from a development that equity markets in the United States entered a long expansion. Their business models scaled efficiently and profit margins stayed strong and market valuations rose significantly throughout the 2010s.

What was also important to the acquisition activity were the financial conditions during this time period. According to Stewart C. Myers and Nicholas S. Majluf (1984) firms usually prefer to rely on internal funds because raising external financing can send an unfavorable signal to investors about firm value. In the years after the financial crisis

many large technology firms were able to finance acquisitions largely with their own resources. The central companies in this thesis, Microsoft and Alphabet and Oracle, built up big cash reserves and generated strong operating cash flows which reduced their dependence on external funding. At the same time low interest rates made borrowing cheaper and high equity valuations increased the attractiveness of stock financed transactions. These factors together created conditions that strongly supported acquisition based expansion.

What makes the technology sector suitable for this type of analysis is not only the scale of acquisition activity but also the strategic reasoning behind it. Acquisitions are usually linked to for example cost savings, capacity increases or geographic expansion in traditional industries. The case can be different for technology firms since they often use acquisitions to gain access to intangible resources and future growth opportunities rather than immediate cash flow improvements. The targets can be frequently smaller and younger companies whose main value comes from software and data and patents or specialized human capital. The technology sector shifts to toward knowledge based production and highlights the growing importance of intangible capital in shaping corporate strategy.

Acquisitions can often serve several overlapping strategic purposes in this environment. Firms may widely use them to enter new technological areas more quickly and to strengthen existing platforms or ecosystems and to reduce the threat from potential future competitors. For example transactions related to cloud computing and artificial intelligence and software development have played an important role in shaping the strategic direction of large technology companies over the past decade (Van der Vlist et. al., 2024). Many of these acquisitions can therefore be seen better as efforts to support longer term competitive positioning rather than as attempts to produce immediate accounting gains.

This strategic logic also involves a high level of uncertainty. The value of many technology acquisitions depends on successful integration and future market developments which

makes it difficult for outside investors to judge whether a transaction will ultimately create or reduce value. The situation is further complicated by the fact that many target firms have short operating histories or business models that are still developing at the time of acquisition. As a result market reactions to technology acquisitions may reflect not only expectations about possible synergies but also doubts about managerial decisions and concerns about whether the acquirer may have paid too much.

From an empirical perspective this is reflected in the M&A literature. Research by Gregory Andrade et al. (2001) shows that takeover announcements usually lead to strong positive returns for target shareholders while the gains for acquiring shareholders are on average small and often not statistically different from zero. At the same time their results make clear that these averages hide substantial differences across firms and industries and time periods. Some acquisitions are clearly viewed by investors as value creating whereas others are received negatively by the market. The technology sector is a useful setting for examining these differences because firms in this area typically face both strong growth opportunities and a high level of valuation uncertainty.

The period after the financial crisis is therefore fitting for studying acquisitions in the technology sector. During these years large technology firms reported strong financial results and expanded their strategic activities through a steady flow of transactions. At the same time competition for innovative assets increased and the valuations of technology companies rose to historically high levels. This combination suggests that some acquisitions were driven by clear growth opportunities and strategic needs. Others may have reflected managerial overconfidence and competitive pressure and concerns about missing important technological developments.

Another defining feature of the post crisis period is the growing importance of platform based business models (Qi, 2024). Microsoft and Alphabet no longer depend only on individual products in their value creation. Their value creation is closely linked to the scale and structure of wider ecosystems that include for example users, developers and complementary services. In this setting acquisitions can support network effects and

expand product portfolios and strengthen control over key technological standards. What makes acquisitions in the technology sector slightly different from more traditional forms of corporate consolidation is this ecosystem driven logic.

This added strategic complexity makes it challenging for investors to judge the real economic consequences of these individual acquisitions. For example in contrast a factory purchase where future cash flow effects can often be estimated with some confidence. A software platform or a group of engineers value when acquiring them depends on outcomes that are uncertain and difficult to measure in advance. Because of this market reactions to technology sector based acquisitions are more likely to reflect both expectations about future strategic gains and also concerns about whether those expectations can actually be realized.

These considerations would suggest that the post financial crisis period provides a clear and economically meaningful setting for examining mergers and acquisitions in the technology sector. During these years large firms operated with strong balance sheets and pursued active acquisition strategies in an environment shaped by supportive financing conditions and quicker technological change. Altough during this time uncertainty remained high and competition for innovative assets was tough. By studying how financial markets responded to announcements under these conditions helps reveal how investors could have interpreted the strategic use of M&A by leading technology companies. It could also offer insight into how markets balanced expectations of long term growth against the risks linked to acquisition driven expansion.

2.3 Theoretical explanations of stock market reactions to M&A

When a merger or acquisition is announced the reaction in the stock market reflects how investors expect the deal to influence the future cash flows and risk profile of the acquiring firm. Because acquisitions are complex strategic decisions and often involve a high degree of uncertainty these expectations might not always be easy to form. Over

time several theoretical approaches have been developed to explain why acquisitions may increase value and reduce it or maybe leave shareholder wealth largely unchanged. These explanations are not competing in a strict sense. In practice market reactions to acquisition announcements are likely shaped by several of these mechanisms at the same time.

One of the most common explanations is the synergy hypothesis. From this perspective mergers and acquisitions create value when the new firm combined from the two firms is able to generate higher cash flows or operate at lower cost than the firms could separately. Such things as economies of scale and a more effective use of complementary assets or stronger market power is where gains might come from. Synergies can often be linked to combining platforms and integrating software ecosystems or maybe expanding access to data and technological capabilities amongst technology companies. A positive stock market reaction to an acquisition announcement would suggest that investors can expect the benefits from these synergies to outweigh the purchase price and the costs related to integration.

In a setting where managers act fully rationally and capital markets operate without frictions acquisitions would take place only when they offer clear positive net present value. In a case like that acquiring shareholders should consistently benefit from these transactions. Widely accepted empirical evidence however does not fully support this expectation. Research summarized by Andrade et al. (2001) argues that target shareholders typically receive strong gains from takeover announcements and the average abnormal returns for acquiring shareholders remain small and often close to zero. Their central argument suggests that even when synergies are present they may be difficult to realize in practice. They might also be competed away during the bidding process or reduced by other factors that weaken the final value created for the acquirer.

Agency problems and managerial incentives also form another widely known explanation. Jensen (1986) argues that managers in firms with substantial free cash flow may prefer to invest in projects with limited value instead of returning excess resources

to shareholders. Firms can use acquiring as a clear way to expand the size and scope even if the logic behind the acquisition is not yet strong. From this perspective some mergers and acquisitions reflect empire building and career related motives and efforts to increase managerial influence or compensation rather than decisions aimed at maximizing shareholder value.

If agency problems play an important role, the stock market should react negatively to at least some acquisition announcements. Especially when they are perceived as unnecessary, excessively large or poorly motivated. This interpretation is consistent with the observation that many acquirers do not earn positive announcement returns on average. It is also relevant in the context of large and financially strong firms, such as major technology companies, which often have enough internal resources and may therefore face fewer external constraints on their investment decisions.

A related but conceptually distinct explanation is the hubris hypothesis proposed by Roll (1986). In this framework managers are not necessarily acting in their own narrow self-interest, but may simply be overconfident in their own ability to identify and execute value-creating acquisitions. Even if managers are sincere in their belief that an acquisition will create value, they may overestimate the potential synergies or underestimate the integration challenges. In competitive bidding situations this type of managerial overconfidence can lead firms to pay too much for their targets. When that happens the expected gains from the transaction are reduced or even eliminated which can result in zero or negative abnormal returns for acquiring shareholders at the time of the announcement.

The hubris hypothesis (Roll, 1986) is especially relevant in industries shaped by rapid technological change and high uncertainty such as the technology sector. It can be difficult to estimate the future value of innovative assets or new platforms in these industries. In these type of conditions it is easier to focus on overly optimistic expectations than to challenge the implementation. From the perspective of investors

acquisition announcements under these conditions may therefore be met with caution when the price paid seems high relative to observable fundamentals.

Information asymmetry, signaling and also the role of the payment method in acquisitions form another important explanation. Myers and Majluf (1984) argue that when managers have better information about the firm's value than outside investors financing decisions can send signals to the market. By noting this framework issuing equity would suggest that it acts as an unfavorable signal because managers are more likely to use shares when they believe the firm may be overvalued. In contrast using internal funds or cash could and does signal stronger confidence both in the firm's valuation and in the quality of the investment opportunity.

When using this framework to mergers and acquisitions this reasoning would suggest that stock financed transactions might be seen as a signal that the acquiring firm's shares are relatively highly valued while cash financed deals are often seen as a stronger sign of commitment by management. This would explain why stock markets usually react more positively to cash financed acquisitions than to those paid with equity. This is a pattern frequently reported in empirical research. In the technology sector where valuation uncertainty is often high and equity based compensation and financing are widely used these signaling effects may become even more visible.

These theoretical explanations do not exclude one another. A single acquisition may involve real synergy potential while also reflecting agency problems and managerial overconfidence and information asymmetry at the same time. The stock market reaction to the announcement therefore reflects how investors interpret these different possibilities based on the information available when the deal becomes public. For example, a cash financed acquisition by a firm with a strong track record of successful integrations may be interpreted primarily through the lens of the synergy hypothesis. At the same time a large stock financed acquisition by a firm with a history of mixed results may trigger concerns related to overvaluation, hubris or agency problems.

The efficient market hypothesis provides a foundation for explaining announcement-period stock returns in this way. If markets are at least semi strong form efficient, publicly available information about an acquisition should be incorporated into stock prices quickly. Under this assumption the abnormal return observed around the announcement date reflects the market's best estimate of the transaction's expected net value based on the information available at that time. A positive abnormal return suggests that investors believe the acquisition is likely to create value for shareholders whereas a negative abnormal return indicates the opposite expectation.

The empirical patterns reported in earlier research fit well with this interpretation. As Andrade et al. (2001) show target firms usually experience large gains at the time of acquisition announcements while the returns for acquiring firms remain modest on average and vary widely across cases. This variation is consistent with the idea that some acquisitions reflect real synergy potential and carefully planned strategies whereas others are shaped by managerial overconfidence and agency related incentives or negative signals linked to the method of financing.

For large technology firms these theoretical arguments become especially relevant. Such firms operate in markets that change quickly where strategic repositioning and the acquisition of new capabilities can play an important role in supporting long term success. On the other hand, they are also defined by high valuations, large cash reserves and substantial managerial discretion. All of which can amplify the risks of overinvestment and overconfidence. As a result there is no reason to expect the stock market to react uniformly positively or negatively to their acquisition announcements.

These perspectives give the foundation for the empirical analysis conducted in this thesis. By examining announcement period abnormal returns and by comparing reactions across firms and across cash- and stock-financed transactions, the study seeks to find out which of these mechanisms appear to dominate in the post-financial crisis

technology sector. The next section turns to the empirical evidence from prior studies, which further motivates the specific hypotheses tested in this thesis.

2.4 Empirical evidence on M&A announcement effects

A large body of empirical literature has examined how stock markets react when merger and acquisition announcements are made. Some with a particular focus on the abnormal returns realized by shareholders of the firms involved. Event-study methodology has become the most suitable tool in this research tradition, since it gives a clear way to isolate market reactions to specific events while controlling for normal return behavior. According to this approach, abnormal returns are those that deviate from what would have been expected in the absence of the event. Cumulative abnormal returns calculated around acquisition announcements are generally interpreted as market based indicators of how investors expect the transaction to affect shareholder value (Itzhak et. al., 2026).

Empirical research on merger and acquisition announcements has produced a fairly consistent general pattern although the size and even the direction of bidder effects can vary across different settings. One of the most common findings is that target firms usually experience clearly positive abnormal returns while acquiring firms often earn smaller or statistically insignificant returns around the announcement date. At the same time more recent studies show that this average pattern can change depending on anticipation effects and trading frictions and the disclosure features. Literature therefore no longer supports a single simple conclusion but it suggests that announcement effects depend on how transactions are structured and how much of the information has already been expected by the market.

Another recent contribution is provided by Cao, Kiesel and Leung (2023) who examine the information content of merger announcement texts. Using initial public M&A

announcements from 1995 to 2020 they analyze the tone of managerial statements released by both targets and acquiring firms. Their results show that more positive language from target firms is associated with higher target returns while differences in tone between the target and the acquirer are linked to weaker target returns. They also find that positive target sentiment is related to a higher likelihood that the transaction will be completed and to a shorter completion period. These findings suggest that markets react not only to the fact that an acquisition has been announced but also to how the transaction is described. This becomes especially important in situations where investors must evaluate qualitative claims about synergies and strategic fit under conditions of uncertainty.

A more direct challenge to the conventional view on bidder returns is presented by Tunyi (2021). The study on the other hand argues that short run event studies may even underestimate the gains from acquisitions because part of the expected value can already be reflected in stock prices before the official announcement. Tunyi shows that the commonly reported near zero or negative abnormal returns are mainly linked to acquisitions that investors had already anticipated. At the same time deals that were not expected then generated average seven day cumulative abnormal returns between 5,4 percent and 7,5 percent.

This finding acts as a useful implication for interpreting announcement effects. When an announcement has weka or negative CAR around announcement date it might not mean it failed to create value. Instead it may reflect the fact that the market had already priced in the information earlier. For large and widely followed firms such as the ones examined in this study analysts and investors monitor strategic developments extremely closely which could increase the likelihood that potential transactions are partly priced in before they are officially announced. In smaller or less transparent markets this type of anticipation is less common which helps explain why similar empirical methods can give out different results across settings.

Evidence from emerging markets further supports the idea that announcement effects differ across regions. Ma, Pagán and Chu (2009) analyze 1,477 M&A transactions across ten Asian stock markets and report positive cumulative abnormal returns for acquiring firms within short event windows including the two day (0,1) window and the three day (−1,+1) window and the five day (−2,+2) window. They also find statistically significant valuation effects before the official announcement date which suggests that information about the transactions may have reached the market in advance. This is a notable differentation to the traditional U.S.-centered result of weak bidder gains. The study suggests that in emerging Asian markets, acquisitions may be interpreted more favorably by investors or alternatively that market structures and informational environments may differ enough to produce stronger bidder-side announcement effects. Either way, the study is useful because it demonstrates that bidder returns are context-dependent rather than universally negligible.

Kinnunen (2022) examines 208 M&A transactions in Nordic stock markets between 2010 and 2019. Using a market-model event study, the thesis finds that M&A announcements are perceived positively in the short term by acquiring-firm shareholders: the average abnormal return peaks at 2,111 percent on the announcement date and remains positive at 0,647 percent on the following day. Kinnunen also investigates possible information leakage and finds some evidence of pre-announcement informed trading, for acquisitions of public targets. The Nordic evidence is therefore closer to the positive-bidder-return findings reported by Ma et al. (2009) than to the traditional U.S. pattern. This strengthens the argument that announcement effects vary meaningfully across markets and are influenced by institutional and informational conditions rather than by one universal law of bidder underperformance.

Other studies caution against taking negative bidder returns at face value. Mitchell, Pulvino and Stafford (2004) show that announcement-period stock-price reactions may be contaminated by temporary price pressure created by merger arbitrage trading. Studying 2130 mergers announced between 1994 and 2000, they find that nearly half of

the negative stock price reaction for acquirers in stock-financed mergers reflects downward pressure. This is caused by arbitrage short selling rather than a pure reassessment of deal fundamentals. After controlling for this effect, the remaining announcement-period reaction becomes much smaller and statistically weak. This is a highly relevant warning for event-study interpretation. A negative CAR does not automatically mean that the market views the transaction as value-destroying. In some cases, it may capture market effects rather than the true informational content of the announcement.

Finally Shah and Arora (2014) provide additional evidence from the Asia-Pacific region using a sample of 37 M&A announcements from May to September 2013. Their event-study results are clear: target firms earn positive and statistically significant cumulative average abnormal returns across all event windows, while bidder firms do not show statistically significant CAARs. They also find that post-announcement returns for targets are significantly greater than pre-announcement returns, indicating an immediate market response to the new information. This study is important because it reproduces the familiar asymmetry between targets and bidders in a regional sample outside the classic U.S. setting. It therefore supports the idea that while bidder gains can emerge under certain conditions, the most robust regularity in the announcement literature remains the strong positive reaction for target shareholders.

These studies point to three conclusions. First the literature continues to show that target firms are typically the main short run beneficiaries of merger and acquisition announcements. Second bidder returns vary across cases rather than following a single consistent pattern since market anticipation and regional differences and deal characteristics all shape the results. Third more recent research shows that measured announcement effects can be influenced by communication style and information leakage and trading frictions which means that raw CAR estimates need to be interpreted with caution.

For this thesis the literature provides a solid basis for examining whether acquisitions by large U.S. technology firms follow the commonly reported pattern of weak bidder returns or whether the characteristics of the sector and the selected sample point to a different type of announcement effect.

2.5 Hypothesis development

The purpose of this section is to translate the theoretical arguments and empirical findings discussed earlier into two testable hypotheses. With the made hypotheses it is designed to capture both the average market reaction to acquisition announcements in the technology sector and the role of the payment method in shaping that reaction. The thesis focus is on the short horizon window for a reason. Stock prices are expected to adjust quickly to new public information when markets are in a semi strong form of efficiency. Taking that into account abnormal returns around the announcement date should reflect how investors evaluate the transaction instantly when it becomes public.

A usual question to ask is if the market sees the acquisition as value creating. Theory alone does not give a clear answer. The central to the synergy hypothesis is that they can be: combining complementary assets, gaining scale or possibly strengthening a competitive position. This logic could fit well into the technology sector, since acquisitions can often be about plugging gaps in a platform, picking up new capabilities or expanding an ecosystem. Applying this logic would mean that some deals do include genuine opportunities and the market would see them accordingly.

Both of the agency based explanations and the hubris hypothesis suggest that acquisitions should not automatically be expected to create value for shareholders. Jensen's (1986) free cash flow argument points out that managers of large and financially strong firms may have incentives to invest in acquisitions even when the expected returns are only modest or possibly negative. Roll's (1986) hubris hypothesis adds that managers may genuinely believe they are creating value while in fact overestimating

potential synergies and underestimating the difficulties of integration. The later can lead to systematic overpayment. In the case of large technology companies these concerns are relevant because they often hold substantial internal resources and operate with a high degree of managerial discretion.

The findings summarized by Andrade et al. (2001) also support this uncertainty. Their overview of earlier studies shows that across broad samples and long time periods acquiring firms on average do not earn large positive abnormal returns around announcement dates. It is also noted in this study that this average outcome hides substantial variation across individual transactions. Some acquisitions are received very positively by the market while others lead to negative reactions. Based on this study there can be asked if the more relevant question is not whether all acquisitions create value but whether investors on balance view these transactions as increasing or reducing shareholder value.

The technology sector in the post financial crisis period is an interesting setting in this respect. As discussed in Section 2.1, during this period firms had strong balance sheets, active acquisition strategies and a focus on acquiring intangible assets and future growth options. This could lead investors to view such transactions on average more favorably than acquisitions in mature and slow-growing industries. At the same time, high valuations and intense competition for attractive targets raise the risk of overpayment, which could offset these positive expectations.

These arguments motivate a first and intentionally broad hypothesis about the average market reaction to acquisitions in the technology sector. Instead of starting from the assumption that announcement effects are negative or close to zero the hypothesis is based on the expectation that acquisitions in this sector and during this period are generally viewed by investors as value creating:

2.5.1 H1: Technology sector M&A announcements generate positive cumulative abnormal returns for acquiring firms around the event window.

This hypothesis does not suggest that every acquisition creates value and it does not ignore the possibility of unsuccessful or overpriced transactions. Instead it proposes that the average market reaction to acquisition announcements by large technology firms is expected to be positive. This expectation reflects the strategic importance of acquisitions in the sector and the role of intangible assets and innovation related synergies in shaping investor evaluations.

Another important difference in acquisitions is the method of payment, which acts as the second hypotheses. The way a transaction is financed can influence how investors interpret it backed up by both theoretical arguments and empirical findings. The signaling framework developed by Myers and Majluf (1984) provides the main theoretical basis for this reasoning. Their model assumes that managers have better information about firm value than inestors and other parties. Managers decision therefore would act as a signal to markets. Issuing equity is often interpreted as an unfavorable signal because managers could be more likely to use shares when they believe the firm may be overvalued. In contrast using internal funds or cash would signal stronger confidence in both the firm's valuation and the quality of the investment made.

In the study made by Andrade et. al. (2001) it is generally consistent with this explanation. They use mant samples and time periods and acquirers are shown to experience less favorable or more negative announcement returns in stock financed transactions than in cash financed ones. It can not be said that all stock based acquisitions are bad or that all cash financed acquisitions are good but it is worth noting that market might have different opinions on the deal depending on the method of payment.

In the technology sector where valuation uncertainty is often high and equity based compensation and financing are widely used and share prices can move strongly in

response to changing expectations about future growth these considerations become relevant. The financing choise signals more visibly in an environment like this. A cash financed acquisition by a large technology firm can therefore be seen as a clear sign of confidence by management whereas a stock financed transaction can lead investors to wonder whether the firm is taking advantage of a temporarily high share price.

Agency based and hubris related explanations also support this expectation. It is a possibility that managers who migh be overly confident or motivated by expansion for its own sake may prefer to finance acquisitions with stock rather than cash. The reason being this reduces the immediate financial commitment and shifts part of the risk to new shareholders. When looking from the investors point of view stock financing can therefore be seen as more questionable on average than the cash financed ones. Forming these arguments together the basis for the second hypothesis of the studyis made:

2.5.2 H2: Cash financed technology sector acquisitions generate higher cumulative abnormal returns than stock financed acquisitions.

How the method of payment shapes the market reaction is the second hypothesis main focus. The M&A transactions have many observable characteristics and the method of payment plays an important role in theoretical and empirical research. It is directly linked to issues of information asymmetry, managerial incentives and market signaling.

The core theoretical foundation for this argument is provided by the information asymmetry framework of Myers and Majluf (1984). They use a model where managers have superior knowledge about the value of the firm, more than outside investors. Because of this informational advantage, financing decisions are not neutral. The managers are in a position where they give out information to the market. When managers choose to issue equity, rational investors infer that the firm's shares may be overvalued, since managers would prefer to avoid selling undervalued equity. Conversely,

when managers rely on internal funds or cash, this is interpreted as a signal of confidence in the firm's valuation and in the quality of the investment opportunity.

When applied to mergers and acquisitions this reasoning suggests that stock financed deals are often linked to an adverse selection concern. Even when an acquisition is strategically justified the choice to pay with shares may lead investors to think that management considers the firm's equity to be relatively highly valued and is therefore using it as a transaction currency. This perception can create an immediate negative price reaction at the announcement stage regardless of the deal's actual long term potential. Cash financed acquisitions do not carry the same signal and are therefore more likely to be interpreted as a stronger indication of confidence in the transaction.

The empirical evidence by Andrade et. al. (2001) goes with this theoretical prediction. Acquirers tend to experience across a wide range of samples and time periods less favorable announcement period abnormal returns when choosing stock financing. The avegare effect does vary across the sample but the result can still be seen as robust. The market systematically separates between payment methods and seems to attach a more positive interpretation to cash offers than to stock offers.

The method of payment influences also on other ways than informationally explaining market reactions. To the same conclusions also point out agency based theories and behavioral theories. Jensen's (1986) free cash flow hypothesis suggests that managers in firms with substantial internal resources may invest in projects that reduce shareholder value instead of returning excess funds to investors. At first this could suggest that cash financed acquisitions should be viewed more cautiously. However the evidence usually shows the opposite.

The hubris hypothesis developed by Roll (1986) adds further support to this argument. If the managers are too confident in their own ability to create value through acquisitions they might overestimate expected synergies created and underestimate the challenges

related to the integration. The method of financing usually becomes a bigger factor in these types of situations. A cash financed acquisition commits real resources and makes the consequences of failure more immediate and visible. Financing with stock allows the deals core qualities to have more flexibility but may also suggest that management is less willing to rely on its own balance sheet. From the investors perspective this difference affects how credible the outside investor evaluates how the strategic rationale behind the acquisition appears.

Large technology firms typically held substantial cash reserves during the post financial crisis period (Pinkowitz et al., 2016). This reduces the argument that stock financing is mainly used because internal funds are unavailable and instead supports the view that the choice of payment method is at least partly strategic. When a firm with significant cash resources still chooses to finance an acquisition with stock investors may reasonably question why management is not willing to commit internal funds to the transaction.

The information asymmetry framework, the agency perspective and the hubris hypothesis all point in the same direction. Even if some stock financed acquisitions ultimately turn out to be successful, the market has good reasons to react more cautiously to them at the time of announcement. Deals that re cash financed give a more positive signal about valuation with a stronger display of managerial commitment and a higher perceived credibility of the strategy.

3 Methodology

This thesis uses the event study methodology fitted into technology sector to examine how financial markets react to merger and acquisition announcements. The event study approach is one of the most widely used empirical methods in financial economics for assessing the impact of information events on security prices. Fama, Fisher, Jensen and Roll (1969) are widely accepted to be the inventors of the methodology. They demonstrated how stock price behavior can be used to evaluate the economic effects of corporate actions. Since then, the method has become a standard tool for analyzing a wide range of corporate events like for example earnings announcements, dividend changes, stock splits and obviously mergers and acquisitions (MacKinlay, 1997).

The idea behind event study methodology relies on efficient market hypothesis (EMH). It needs that financial markets process new information efficiently and the information should be priced in quickly. When a firm announces a merger or acquisition investors receive new signals about strategy and expected synergies and risks and future cash flows. Stock prices start reflecting how market participants adjust their expectations in response. The price change observed around the announcement therefore provides an indication of how investors evaluate the economic implications of the transaction (Fama et al., 1969; MacKinlay, 1997).

Mathematically in event study framework the normal returns are separated from the abnormal returns that come from the announcement. Normal returns describe the return a stock would be expected to earn without the event and are estimated from its typical behavior over time. The abnormal returns arise from the information of the announcement. The difference between these two components is called the abnormal return and it forms the main measure used in the analysis (Fama et al., 1969). When these abnormal returns are added together over a short window around the announcement it becomes possible to estimate the overall effect of the event on shareholder value.

There has to be made two clear assumptios to credibile use this approach. First the event must be clearly defined in time so that the point at which new information becomes public can be identified with reasonable accuracy. In the case of mergers and acquisitions the announcement date usually satisfies this condition. Second the time window used to measure the market reaction must be short enough to reduce the influence of unrelated news that could affect the results. As MacKinlay (1997) explains these assumptions do not require markets to be perfectly efficient in a strict theoretical sense. It is enough if the markets are efficient enough so that the main event shows quickly enough within a narrow interval around the event.

How the event window is defined is therefore one of the mot importat choises made in event study. In this thesis there are used three short event windows centered on the announcement date: a narrow window of [-1, +1] trading days, a slightly wider window of [-3, +3] trading days and a [-30, +30] window. The narrower windows are used to capture the instant market reaction to the announcement itself, while the wider window allows for the possibility of minor information leakage before the announcement or possibly a short delay in the market's adjustment. Using more than one event windows is consistent with normal event study practices and allows the analysis to assess the robustness of the results to reasonable variations in the length of the window (MacKinlay, 1997).

The short event windows are important to credibly maintain a causal interpretation. Over longer windows the stock performance can be affected by a wide range of firm specific factors that can be urelated to the acquisition. Therefore if the window is too extended too long the price movements related to the acquisition become harder to capture. By using shorter windows the probability of unrelated news change the result reduces. This is why the event study methodology, as originally formulated by Fama et al. (1969) and later refined by MacKinlay (1997), is fundamentally a short horizon tool.

A central fundamental relateing to event windows is the estimation period that defines time period used to determine the normal price behaviour of the stock. In this thesis the

estimation window is chosen as −250 to +30 trading days around the announcement date. A longer estimation period improves the robustness of the results as noted by MacKinlay (1997). At the same time this period serves as a local benchmark for the stock's usual price behavior near the event.

The estimation window's purpose is to show the typical return dynamics in a time frame that remains close enough to the announcement to stay representative. At the sae time it still would allow abnormal returns around the event to be interpreted as deviations from that benchmark. MacKinlay (1997) explains that an important feature in an event study is the separation between the period used to estimate normal performance and the period used to measure event effects.

The abnormal returns can be then computed for each firm after the benchmark for the price movements has been chosen. After the abnormal returns as in unexpected component in this study are calculated can they then be used in the empirical analysis. The analysis in this thesis focuses on the abnormal returns among the event windows since daily abnormal returns can be noisy. Cumulative measures aggregate the daily abnormal returns and therefore provide a more stable and economically meaningful summary of the total market reaction to the announcement (MacKinlay, 1997).

Statistical inference in the event study framework is concerned with determining whether the observed abnormal returns are systematically different from zero. If markets do not perceive the announcement as value relevant, abnormal returns should fluctuate randomly around zero. If on the other hand, the event gives economically meaningful information, abnormal returns should show a consistent positive or negative pattern across observations. Testing whether average cumulative abnormal returns differ from zero therefore provides a direct test of whether the market views the acquisition announcement as value creating or value destroying (Fama et. al., 1969).

One of the event study methodology's strengths is that it naturally takes into account cross sectional heterogeneity. Not all mergers and acquisitions are expected to have the same economic implications and not all announcements should trigger the same market reaction. Some of the transactions might be seen as strategically sound and value creating, while others might be viewed with suspicion. By computing abnormal returns at the level of individual events, the methodology makes it possible to go beyond average effects and to analyze how market reactions vary across different types of transactions (MacKinlay, 1997).

The purpose of the event study design is to identify economically meaningful stock market responses to corporate control decisions. Therefore the final sample was limited to acquisitions that were most notable by disclosed transaction value during the chosen period. Five of the biggest acquisitions by disclosed value for each company are evaluated. Prior work shows that acquisition announcement effects vary systematically with size related dimensions. It also notes that economically large deals can dominate shareholder wealth outcomes, when evaluated in dollar terms rather than only percentage abnormal returns (Moeller et. al., 2004; Moeller et. al., 2005).

It has also been shown in evidence from merger wave research that aggregate wealth effects can be heavily influenced by periods and transactions characterized by large deal values and acquisition spending (Moeller et al., 2005). This can be used as a background to choose large valued acquisitions when the plan is to capture events that might cause changes. By sampling the events like this it increases the probability that the announcements include material information. Because of this the signal to noise (SNR) properties improve, while acknowledging that smaller acquisitions might be harder to use.

To collect the sample of acquisitions for this analysis, the data was collected on the Orbis M&A database (formerly known as Zephyr) which is maintained by Bureau van Dijk. Orbis M&A is a widely used commercial database containing detailed information on completed and announced mergers, acquisitions and related transactions globally. It

includes deal participants, deal characteristics and disclosed transaction values, with historical coverage spanning multiple decades and jurisdictions.

Within this large sample, transactions were filtered to retain only those that are most notable in terms of disclosed valuation during the defined study period. Transaction value, defined as the total compensation paid by the acquirer, is a common operationalization of economic magnitude in M&A research (Alexandridis et. al., 2017). Focusing on high valued deals increases the likelihood that the events represent materially significant changes in control and strategic direction. Higher valuation deals also tend to generate clearer and more statistically detectable stock market reactions, which enhances the power and interpretability of event study tests.

During the sample construction process, it became evident that not all acquisition transactions reported in the Orbis M&A database contained disclosed information on deal valuation. Because transaction value serves as the primary criterion for identifying the most economically significant acquisitions within the defined time period, observations lacking reliable valuation data could not be consistently ranked or compared. Consequently, acquisitions for which the total value was not publicly disclosed were excluded from the final sample.

This exclusion was necessary for methodological consistency. The empirical design of this study relies on transaction value as an operational measure of economic magnitude and the filtering procedure requires a comparable metric across all observations. Including transactions with missing valuation data would have introduced heterogeneity in the selection mechanism, potentially biasing the composition of the sample. For example, undisclosed deals may systematically differ from disclosed ones in terms of size, ownership structure, cross-border characteristics or regulatory environment. Without verifiable valuation figures, it would not be possible to determine whether such transactions meet the predefined threshold for economic significance.

Furthermore, the absence of disclosed valuation may itself reflect structural characteristics of certain transactions. Smaller private targets, intra-group

restructurings or transactions in jurisdictions with limited disclosure requirements are more likely to omit deal value information. As a result, the exclusion of undisclosed-value transactions may introduce a degree of selection bias toward larger, publicly visible and more transparent deals. This effect is partially aligned with the study's objective, which is to focus on the most notable acquisitions in terms of financial magnitude and market relevance. Larger transactions involving publicly listed acquirers are more likely to be accompanied by formal disclosures, analyst coverage and identifiable announcement dates. This said strenghtening the reliability of event identification and stock return measurement.

3.1 Introduction of the acquisitions

The following section presents the largest acquisitions conducted by three major technology firms, Microsoft, Oracle and Alphabet. The time period is from 31.12.2009 to 1.1.2019. The selected sample period begins after the global financial crisis and ends prior to the COVID-19 pandemic. This timeframe was chosen to avoid major systemic disruptions that could significantly distort stock market behavior and interfere with the identification of announcement-related effects.

These transactions represent the most significant deals in terms of disclosed transaction value and therefore serve as the primary events examined in this study. Focusing on the largest acquisitions allows the analysis to concentrate on transactions that are most likely to influence investor expectations and market reactions. Large acquisitions typically involve substantial capital commitments and strategic shifts, which often attract considerable attention from investors, analysts and financial media. As a result, these transactions provide relevant cases for examining stock market responses to merger and acquisition announcements.

For Microsoft, the largest acquisitions during the period include LinkedIn, Skype Technologies, GitHub, Nokia's mobile phone unit and Mojang Studios. Among these, the acquisition of LinkedIn in 2016, valued at approximately 26,2 billion USD, stands as the largest transaction undertaken by the company during the examined timeframe. The deal represented a major strategic move into professional networking and enterprise integration within Microsoft's productivity ecosystem. Earlier, in 2011, Microsoft acquired Skype Technologies for approximately 8,5 billion USD, strengthening its capabilities in internet communication services. Another notable transaction occurred in 2018 with the acquisition of GitHub for approximately 7,5 billion USD, reflecting Microsoft's strategic emphasis on developer platforms and cloud-based collaboration. The purchase of Nokia's mobile phone unit in 2013, valued at roughly 7,2 billion USD, represented Microsoft's attempt to strengthen its position in the smartphone market. Additionally, Microsoft acquired Mojang Studios, the developer of the widely popular game Minecraft, in 2014 for approximately 2,5 billion USD, marking an expansion of its presence in the gaming industry.

Oracle's largest acquisitions in the same period show the company's strategic focus on enterprise software and cloud-based business solutions. The largest transaction was the acquisition of NetSuite in 2016 for approximately 9,3 billion USD. This deal was significant as it strengthened Oracle's position in cloud-based enterprise resource planning (ERP) and software-as-a-service platforms. In 2014, Oracle acquired MICROS Systems for approximately 5,3 billion USD, expanding its footprint in hospitality and retail technology solutions. Other notable acquisitions include Acme Packet in 2013 for approximately 2,1 billion USD, which enhanced Oracle's telecommunications and networking capabilities and Taleo in 2012 for approximately 1,9 billion USD, which strengthened Oracle's cloud-based human capital management offerings. The acquisition of RightNow Technologies in 2011 for approximately 1,5 billion USD further reinforced Oracle's customer service cloud solutions.

Alphabet's acquisitions during the examined period reflect the company's expansion into hardware, smart devices and digital platforms. The largest acquisition was Motorola Mobility in 2011 for approximately 12,5 billion USD. This transaction represented a major strategic move into mobile hardware and intellectual property, in relation to smartphone patents. In 2014, Alphabet acquired Nest Labs for approximately 3,2 billion USD, entering the rapidly growing smart home technology market. Another significant deal occurred in 2017 when Alphabet acquired a portion of HTC's smartphone engineering team for approximately 1,1 billion USD, strengthening the company's hardware development capabilities for devices such as the Pixel smartphone. The acquisition of Waze in 2013 for approximately 966 million USD expanded Google's navigation and mapping ecosystem by integrating community-based traffic data into its services. Lastly, the acquisition of Apigee in 2016 for approximately 625 million USD enhanced Google's cloud platform by adding advanced application programming interface (API) management capabilities.

Five largest deals, 31.12.2009–1.1.2019		
Microsoft		
Announcement date	**Target**	**Deal value (USD)**
Jun 13, 2016	LinkedIn	26.2B
May 10, 2011	Skype Technologies	8.5B
Jun 4, 2018	GitHub	7.5B
Sep 3, 2013	Nokia mobile phones unit	7.2B
Sep 15, 2014	Mojang Studios	2.5B
Oracle		
Announcement date	**Target**	**Deal value (USD)**
Jul 28, 2016	NetSuite	9.3B
Jun 23, 2014	MICROS Systems	5.3B
Feb 4, 2013	Acme Packet	2.1B
Feb 9, 2012	Taleo	1.9B
Oct 24, 2011	RightNow Technologies	1.5B
Alphabet		
Announcement date	**Target**	**Deal value (USD)**
Aug 15, 2011	Motorola Mobility	12.5B
Jan 13, 2014	Nest Labs	3.2B
Sep 21, 2017	Part of HTC (smartphone team	1.1B
June 11, 2013	Waze	0.966B
Sep 8, 2016	Apigee	0.625B

Figure 1 Information of the acquisitions

4 CAR's and T-Statistic

Having established the event study framework as the methodological foundation of the empirical analysis, the next step is to define how abnormal stock returns are measured and how their statistical significance is evaluated. The measurement of abnormal performance depends on identifying deviations from normal return behavior during the period surrounding the event. This thesis focuses on cumulative abnormal returns (CARs) as the central summary measure of market reactions and evaluates their statistical significance using t-statistics. The combination of cumulative abnormal returns and statistical testing provides a transparent and widely accepted framework for quantifying how investors reevaluate firm value when new information becomes public.

Abnormal returns represent the difference between the realized return of a stock and the return that would normally be expected in the absence of the event. Conceptually, an abnormal return captures the portion of a stock's performance that cannot be attributed to typical market movements or normal fluctuations in trading activity. It reflects the market's response to new firm-specific information. In the context of merger and acquisition announcements, a positive abnormal return indicates that investors revise their expectations about the acquiring firm's future prospects upward. If a negative abnormal return occurs, it means that a negative value effect is expected.

Imporant to recocnice is that daily abnormal returns are inherently noisy. Even in periods without major news. Stock prices fluctuate due to liquidity effects, random trading behavior and minor information arrivals. For this reason, focusing on single day abnormal returns can be misleading. The standard practice in event study research is therefore to aggregate abnormal returns over a short event window to obtain cumulative abnormal returns or CARs (MacKinlay, 1997). This serves both the theoretical and statistical purposes.

From a conceptual perspective, a CAR represents the total change in shareholder wealth attributable to the event over the chosen window. If the window is sufficiently short and well chosen, the CAR can be interpreted as the market's best estimate at the time of the announcement, of the value of the transaction. In other words, CARs capture the immediate revaluation of the firm based on new information, not the long-term success or failure of the strategic decision. Important to know is that event studies are about expectations and beliefs, not about realized operating performance.

From a statistical perspective, aggregation improves the signal-to-noise ratio. Random daily fluctuations tend to cancel out when summed over several days, while systematic effects related to the event accumulate. This makes it easier to find economically meaningful patterns and to conduct statistical tests with reasonable power. As discussed by MacKinlay (1997), this is one of the main reasons why cumulative rather than daily abnormal returns are used as the primary object of inference in most event studies.

CARs are computed for each event and each event window. These event level CARs can then be averaged across the sample to assess the typical market reaction. They can also be used as the dependent variable in cross-sectional analyses that try to find out why some announcements are received more favorably than others. In both cases, the interpretation remains the same. CARs summarize the market's collective judgment about the value implications of the event at the time the information becomes public.

To evaluate whether the observed CARs are statistically different from zero, this thesis evaluates the price change's significance by t-statistic. The t-statistic provides a measure of how large the estimated abnormal return is relative to the variability of returns. In practice, the t-statistic is calculated by dividing the CAR by its estimated standard error. If the resulting value exceeds commonly used critical thresholds, the abnormal return can be considered statistically significant. This procedure allows to distinguish between price movements that are likely driven by the event itself and those that may simply reflect random market fluctuations.

The use of statistical significance testing is essential because stock prices are inherently volatile. Even in the absence of major events, returns can vary considerably from day to day. By comparing the magnitude of CARs to the variability of abnormal returns, t-statistics provide a formal way to determine whether the observed market reaction is unusually large relative to normal return behavior.

It is worth being clear about what CARs do not tell us. A positive CAR does not mean the acquisition will ultimately succeed and a negative CAR does not mean it will fail. As MacKinlay (1997) points out, event study results capture what the market believed at a specific moment in time. Those beliefs may later prove right or wrong. This is not a flaw in the methodology, but it does define boundaries. Event studies are about how markets process information, not about whether strategic decisions pan out in the long run (Oler et. al., 2008).

Using cumulative abnormal returns and t-statistics provides a logical and transparent framework for quantifying market reactions to merger and acquisition announcements. CARs aggregate abnormal performance into an economically meaningful summary measure, while statistical testing allows the analysis to evaluate whether the observed reactions are significant. Within the broader event study methodology, this approach allows the analysis to move from raw price changes to a structured interpretation of how investors reassess firm value in response to new strategic information.

The following figure presents the mathematical models underlying the empirical analysis and used to compute abnormal returns.

Market model:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \epsilon_{it}$$

CAR definition:

$$CAR = \sum AR_t$$

Regression:

$$CAR_i = \beta_0 + \beta_1 Cash_i + \epsilon_i$$

Figure 2 Mathematical models used

5 Results

This section discusses the results of how each acquisition affected the acquiring firm's stock performance. The cases are examined one by one, followed by a statistical evaluation of the cumulative abnormal returns. Corresponding t-statistics across the full sample are then discussed briefly.

5.1 Acquisitions by Microsoft

The short term stock market reaction to Microsoft’s major acquisitions was examined using an event study methodology. Daily stock returns of Microsoft were compared with market returns from the S&P 500 Index in order to estimate abnormal returns (AR). Expected returns were calculated using the market model based on an estimation window of 250 to 30 trading days prior to each acquisition announcement. Abnormal returns were then aggregated into cumulative abnormal returns (CAR) for the event windows (0), (-1,+1), (-3,+3) and (-30,+30).

5.1.1 Case 1. LinkedIn

Microsoft announced the acquisition of LinkedIn on 13 June 2016. The transaction was valued at approximately 26,2 billion dollars. It was one of the largest acquisitions in Microsoft’s history. The strategic objective was to integrate LinkedIn’s professional networking platform with Microsoft’s enterprise software ecosystem. By combining LinkedIn’s data with products such as Office and Dynamics, Microsoft tried to strengthen its position in enterprise productivity and business services.

The stock market reaction was negative on the announcement day. Microsoft recorded an abnormal return of approximately −1,689 percent. This indicates that the company’s

stock underperformed relative to expected market returns. Investors may have responded cautiously to the size of the deal and the premium paid for LinkedIn.

The short term event windows show a similar pattern. The three-day CAR(−1,+1) is approximately −1,385 percent. Expanding the window further produces a CAR(−3,+3) of approximately −1,769 percent. These results would suggest that the negative sentiment continued briefly after the announcement.

Over a longer horizon the pattern changes. The CAR(−30,+30) window reaches approximately +4,862 percent. Microsoft's stock therefore recovered during the weeks surrounding the announcement. This may reflect a reassessment of the potential strategic benefits of integrating LinkedIn with Microsoft's enterprise software platform.

5.1.2 Case 2. Skype Technologies

Microsoft announced the acquisition of Skype on 10 May 2011 for approximately 8,5 billion dollars. At the time it represented the largest acquisition undertaken by the company.

The immediate stock market response was negative. On the announcement day Microsoft recorded an abnormal return of approximately −1,254 percent. This indicates that the company's stock declined relative to expected market performance.

The broader short term event windows confirm this pattern. The three-day CAR(−1,+1) reaches approximately −1,815 percent. When the window is expanded to seven days the CAR(−3,+3) becomes approximately −2,638 percent. These results suggest that investors remained cautious during the days following the announcement.

The longer event window presents a different picture. The CAR(−30,+30) window shows a cumulative abnormal return of about +5,117 percent. Microsoft's stock therefore

improved during the weeks surrounding the announcement. Investors may have gradually reassessed the strategic potential of integrating Skype into Microsoft's communication and productivity services.

5.1.3 Case 3. GitHub

Microsoft announced the acquisition of GitHub on 4 June 2018 for approximately 7,5 billion dollars in an all-stock deal. GitHub was the largest platform for collaborative software development and open-source code hosting. The acquisition was strategically important for Microsoft's developer ecosystem and cloud computing strategy.

The initial market reaction was slightly positive. Microsoft recorded an abnormal return of approximately 0,148 percent on the announcement day. This indicates that the stock slightly outperformed expected market returns.

The three-day event window also shows slight positive result. The CAR(−1,+1) reaches approximately +0,807 percent. Investors may have expected that GitHub would strengthen Microsoft's relationship with developers and support the company's cloud platform.

The broader seven-day window reveals a decline. The CAR(−3,+3) falls to approximately −1,930 percent. This suggests that the initial optimism weakened as investors reassessed the strategic implications of the acquisition.

The overall effect remains limited throughout the time windows. The CAR(−30,+30) is roughly −0,422 percent. These results show that the acquisition had little to no impact on Microsoft's stock performance.

5.1.4 Case 4. Nokia

Microsoft announced the acquisition of Nokia's Devices and Services division on 2 September 2013 for approximately 7,2 billion dolalrs. Because the announcement occurred on a U.S. market holiday, the first trading day used in the analysis is 3rd of September 2013. The acquisition was intended to strengthen Microsoft's position in the smartphone market by integrating hardware production with the Windows Phone operating system.

Among the acquisitions examined in this study, the Nokia transaction produced the strongest short term reaction. On the announcement day Microsoft experienced an abnormal return of approximately −4,877 percent. This represents a substantial decline relative to expected market performance.

The negative response becomes even clearer when surrounding trading days are considered. The three-day CAR(−1,+1) reaches approximately −7,879 percent. The seven-day CAR(−3,+3) is around −7,490 percent. These results indicate that the negative sentiment persisted for several trading sessions.

Several factors may explain this reaction. While the rationale was to integrate Nokia's hardware capabilities with the Windows Phone operating system, the acquisition was also driven by a more defensive motive. If Microsoft had not acted, Nokia would likely have abandoned Windows Phone in favour of Android, leaving Microsoft without its only major hardware partner (Carlson, 2013). The deal ultimately proved costly, with Microsoft writing off $7.6 billion and laying off thousands of employees within two years of closing (Slidebean, 2024)

Despite the strong short term decline, the longer event window shows a recovery. The CAR(−30,+30) window reaches approximately 13,172 percent. This would suggest that Microsoft's stock improved during the weeks surrounding the announcement.

5.1.5 Case 5. Mojang Studios

Microsoft announced the acquisition of Mojang Studios on 15 September 2014 for 2,5 billion dollars. Mojang was the developer of the highly popular video game Minecraft. Compared with Microsoft's other major acquisitions, the transaction was relatively small in financial terms.

The immediate market reaction was modest. On the announcement day Microsoft recorded an abnormal return of approximately −0,993 percent. This represents a small decline relative to expected market performance.

The short term event windows show the same pattern. The three-day CAR(−1,+1) is approximately −0,827 percent. The seven-day CAR(−3,+3) reaches approximately −1,827 percent. These results suggest that investors responded somewhat cautiously to the announcement.

The effect stays minimal over the (-30,+30) window. The CAR(−30,+30) window shows a cumulative abnormal return of approximately +0,282 percent. This would indicate that the market impact of the acquisition largely vanished during the weeks surrounding the announcement.

5.2 Acquisitions by Oracle

The short term stock market reaction to Oracle's major acquisitions was examined using an event-study methodology. Daily stock returns of Oracle were compared with market returns from the S&P 500 Index in order to estimate abnormal returns (AR). Expected returns were calculated using the market model based on an estimation window of 250 to 30 trading days prior to each acquisition announcement. Abnormal returns were then

aggregated into cumulative abnormal returns (CAR) for the event windows (0), (-1,+1), (-3,+3) and (-30,+30).

5.2.1 Case 1. RightNow Technologies

Oracle Corporation announced the acquisition of RightNow Technologies on 24 October 2011 for 1,5 billion dollars. RightNow was a provider of cloud-based customer service and support software. The transaction was part of Oracle's strategy to expand its cloud applications and software-as-a-service offerings. This part was considered important as enterprise software markets were gradually shifting toward cloud-based solutions.

The immediate market reaction was moderately positive. On the announcement day Oracle recorded an abnormal return of approximately +0,667 percent. This shows that the company's stock slightly outperformed expected market returns. The positive response continued briefly when surrounding trading days were included. The three-day window produced a CAR(−1,+1) of approximately +1,211 percent, suggesting that investors initially viewed the acquisition favorably.

The positivity weakened when the window was expanded further. The seven-day CAR(−3,+3) declines to approximately −0,661 percent. This suggests that investors reassessed the acquisition more critically in the days following the announcement. Over the CAR(−30,+30) window the cumulative abnormal return rises again to approximately +10,362 percent. Oracle's stock therefore improved during the weeks surrounding the announcement. Indicating investors ultimately viewed the acquisition as strategically beneficial.

5.2.2 Case 2. Taleo

On 9 February 2012, Oracle announced the acquisition of Taleo for approximately 1,9 billion dollars. Taleo was a cloud-based human capital management company and the deal was a natural fit for Oracle's push into enterprise cloud software, in workforce management and recruitment.

The reaction to the announcement was slightly positive. Oracle's abnormal return on the event day was approximately +0,432 percent. This indicates that the stock marginally outperformed expected market returns. However, the positive response did not persist once surrounding trading days were included.

The three-day CAR(−1,+1) declines to approximately −0,939 percent, suggesting that the initial optimism faded. When the window is extended to seven days, the CAR(−3,+3) falls further to approximately −3,09 percent. These results indicate that investors became somewhat cautious as they evaluated the strategic implications of the acquisition. In the CAR(−30,+30) window the cumulative abnormal return increases to approximately +1,530 percent, suggesting that Oracle's stock performance improved during the weeks surrounding the announcement.

5.2.3 Case 3. Acme Packet

Oracle announced the acquisition of Acme Packet on 4 February 2013 for 2,1 billion dollars. Acme Packet developed network infrastructure technology used in telecommunications and internet communication systems. The acquisition was in order to to support Oracle's capabilities in network infrastructure and communication technology.

The market reaction to the announcement was negative. On the event day Oracle's abnormal return was approximately −1,660 percent. The three-day CAR(−1,+1) reaches

approximately −1,131 percent. When the window is expanded to seven days the CAR(−3,+3) declines further to approximately −3,685 percent. These results indicate that investor concerns persisted during the days following the announcement.

Even in CAR(−30,+30) window the cumulative abnormal return remains negative at approximately −0,869 percent. The sustained decline suggests that investors were uncertain about the strategic fit of telecommunications infrastructure within Oracle's core enterprise software business.

5.2.4 Case 4. MICROS Systems

Oracle announced the acquisition of MICROS Systems on 23 June 2014 for about 5,3 billion dollars. MICROS provided specialized software and hardware solutions for hospitality and retail businesses, including point-of-sale systems and enterprise management software. The acquisition represented a significant expansion into industry-specific enterprise technology solutions.

The announcement initially generated a small positive reaction. Oracle recorded an abnormal return of +0,654 percent on the event day. The three-day CAR(−1,+1) goes to negative at approximately -3,801 percent. These results suggest that investors initially responded negatively to the acquisition.

The broader event windows reveal a same type of pattern. The seven-day CAR(−3,+3) declines sharply to approximately −6,449 percent. The longer CAR(−30,+30) window shows an even larger negative cumulative abnormal return of approximately −8,220 percent. These results indicate that investor sentiment became increasingly negative after the initial announcement. Concerns regarding integration costs and strategic fit may have emerged during the days following the announcement.

5.2.5 Case 5. NetSuite

Last acquisition examined by Oracle is NetSuite. The acquisition of NetSuite on 28 July 2016 for 9,3 billion dollars. NetSuite was a leading provider of cloud-based enterprise resource planning software. Intention was to invest heavily in both engineering and distribution to accelerate the availability of cloud solutions across more industries and countries (SEC, 2016).

The immediate reaction to the announcement was modest. Oracle's abnormal return on the event day was approximately +0,453 percent. The broader event windows suggest that the overall reaction remained largely neutral.

The CAR(−1,+1) window is approximately +0,008 percent, while the CAR(−3,+3) window remains close to zero at approximately −0,041 percent. CAR(−30,+30) window increases the cumulative abnormal return slightly to approximately +0,321 percent. These results suggest that the acquisition did not alter investor expectations regarding Oracle's financial performance.

5.3 Acquisitions by Alphabet

The short term stock market reaction to Alphabet's major acquisitions was examined using an event-study methodology. Daily stock returns of Alphabet were compared with market returns from the S&P 500 Index in order to estimate abnormal returns (AR). Expected returns were calculated using the market model based on an estimation window of 250 to 30 trading days prior to each acquisition announcement. Abnormal returns were then aggregated into cumulative abnormal returns (CAR) for the event windows (0), (-1,+1), (-3,+3) and (-30,+30).

5.3.1 Case 1. Motorola

Alphabet announced the acquisition of Motorola Mobility on 15 August 2011 for 12,5 billion dollars. At the time, the transaction represented one of the company's largest strategic investments. The acquisition would enable Google to "better protect Android from anti-competitive threats from Microsoft, Apple and other companies" (Page, 2011).

The stock market reaction to the announcement was negative. The abnormal return on the event day was approximately −3,315 percent, indicating that investors initially responded cautiously to the transaction. This negativity lasted when surrounding trading days were considered. The three-day event window CAR(−1,+1) reached approximately −5,709 percent, while the seven-day window CAR(−3,+3) declined further to approximately −9,460 percent. These results suggest that market participants were uncertain about the strategic implications of expanding more deeply into hardware manufacturing.

In the longest window the cumulative effect gained momentum. The CAR(−30,+30) was approximately +22,959 percent, signaling that the acquisition altered expectations regarding Alphabet's longer term valuation. Alphabeth's stock performed extremely well comparing to S&P500 during the same time period.

5.3.2 Case 2. Waze

Alphabet announced the acquisition of Waze on 11 June 2013 in a deal valued at 966 million dollars. The transaction was widely viewed as a strategic effort to expand the company's digital mapping and navigation services through the integration of real time user generated traffic data into its existing platform

Investor reactions to the announcement were modest. The abnormal return on the event day was approximately -0,319 percent, suggesting a slightly negative immediate

response. This reaction continued in the short event window, with CAR(−1,+1) reaching approximately +0,625 percent. The broader seven-day window showed a small decline, as CAR(−3,+3) fell to approximately +0,211 percent.

The cumulative abnormal return remained small but still positive at around +1,478 percent in the (-30,+30) window. The results suggest that investors viewed the transaction as strategically reasonable but financially limited in scope.

5.3.3 Case 3. Nest Labs

On 13 January 2014 Alphabet announced tht it would acquire Nest Labs for 3,2 billion dollars. With this deal the company signaled its intention to expand into the emerging smart home and Internet of Things ecosystem.

The announcement generated a modest positive reaction in the stock market. The abnormal return on the event day was approximately +0,453 percent. Similar patterns appear in the surrounding event windows. The CAR(−1,+1) reached approximately +1,378 percent, while CAR(−3,+3) remained positive at +0,470 percent.

These results suggest that the acquisition was seen positive primarily as a long term strategic investment rather than an initiative expected to generate immediate financial gains. This is further supported by the longer event window, where the CAR(−30,+30) reached approximately +6,654 percent.

5.3.4 Case 4. Apigee

On 8 September 2016, Alphabet announced its agreement to acquire Apigee in a transaction valued at 625 million dollars. Apigee specialized in application programming

interface management technology and the acquisition supported Alphabet's effort to improve its enterprise cloud platform (Greene, 2016).

Market reactions to the announcement were relatively muted. The abnormal return on the event day was approximately -0,449 percent. The short term cumulative abnormal returns followed a similar pattern. The CAR(−1,+1) window reached approximately +0,104 percent, while CAR(−3,+3) rose slightly to approximately +1,446 percent. These results suggest that investors did not expect the acquisition to significantly influence Alphabet's short term financial performance.

Over the longer event window, the CAR(−30,+30) was +7,768 percent. The longer event window results would indicate that the acquisition was seen as a strategically useful and made a positive impact on the stock performance.

5.3.5 Case 5. HTC's smartphone engineering team

As the last acquisition examined in this study, Alphabet announced on 21 September 2017 that it would acquire part of HTC's smartphone engineering team in a transaction valued at 1,1 billion dollars. The agreement included the transfer of several thousand engineers together with non exclusive rights to selected smartphone related intellectual property. This supported the development of Alphabet's in-house hardware capabilities (Osterloh, 2017).

The event study results show that the announcement had only a limited effect on Alphabet's stock performance. The abnormal return on the announcement day remained small, around +0,369 percent. The CAR(−1,+1) and CAR(−3,+3) windows remain close to zero at +0,902 percent and +0,410 percent. This suggests that the surrounding trading days did not significantly alter investor sentiment.

The longer CAR(−30,+30) window shows positive impact. The CAR for this window was +5,119 percent. These results indicate that the transaction was viewed relatively positive after the shorter period.

5.4 Cash financed versus stock financed

Among the fifteen acquisitions examined, fourteen transactions were financed with cash. Only one acquisition, Microsoft's purchase of GitHub, was financed with stock. The GitHub acquisition produced modest short term positive abnormal returns but slightly negative cumulative abnormal returns over wider event windows. The CAR(−3,+3) reached around −1,90 percent and the CAR(−30,+30) stayed slightly negative at approximately −0,42 percent. These results show that the transaction did not generate a strong positive market response relative to expected returns.

In contrast to this several cash financed acquisitions produced clearly positive cumulative abnormal returns over longer event windows. Microsoft's acquisitions of LinkedIn and Skype generated CAR(−30,+30) values of approximately +4,86 percent and +5,11 percent respectively. Oracle's acquisition of RightNow produced a cumulative abnormal return of approximately +10,36 percent. Also the acquisition of Nokia resulted in a CAR(−30,+30) of +13,17 percent, which represents the strongest longer window reaction observed in the sample.

Across the Alphabet acquisitions that were also cash financed, cumulative abnormal returns remained generally small but positive in most cases. This would further support the interpretation that cash financed transactions were not associated with negative announcement effects in the sample as a whole.

Because the dataset includes only one stock financed acquisition, it is not suitable to perform a robust statistical comparison between financing methods. The evidence should therefore be interpreted as descriptive rather than conclusive. Nevertheless, the

observed pattern remains consistent with the study's hypothesis that cash financed acquisitions generate higher cumulative abnormal returns than stock-financed acquisitions within the technology sector.

5.5 CAR & T-statistic analysis

Company	Acquisition	CAR(0)	t(CAR0)	CAR(-1,+1)	t(-1,+1)	CAR(-3,+3)	t(-3,+3)	CAR(-30,+30)	t(-30,+30)
Microsoft	LinkedIn	-0,016894235	-1,426669472	-0,013845896	-0,675064538	-0,01768587	-0,56449779	0,048617201	0,525665988
Microsoft	Skype	-0,012537133	-1,273883019	-0,018152915	-1,064920225	-0,026383465	-1,013244206	0,051173715	0,665753322
Microsoft	GitHub	0,001480964	0,177378746	0,008073937	0,558318185	-0,019303972	-0,873885807	-0,004222002	-0,064745641
Microsoft	Nokia Devices	-0,048773979	-3,73582195	-0,078789725	-3,48423102	-0,074903324	-2,168453218	0,131723263	1,291800793
Microsoft	Mojang	-0,009928477	-0,909140705	-0,008272224	-0,437330868	-0,018273486	-0,632442247	0,00281558	0,033010453
Oracle	RightNow	0,006674735	0,678486379	0,012109251	0,710663137	-0,006614628	-0,254134455	0,103620376	1,348613096
Oracle	Taleo	0,004322138	0,318902841	-0,00938773	-0,399907691	-0,030491545	-0,850335259	0,015304926	0,144585948
Oracle	Acme Packet	-0,016604257	-1,867170357	-0,011308106	-0,734165106	-0,036852992	-1,566347891	-0,008691685	-0,125142134
Oracle	MICROS Systems	0,00632975	0,6543498	-0,038008289	-2,268511979	-0,064490509	-2,519823788	-0,082202945	-1,088042467
Oracle	NetSuite	0,004527312	0,537483812	8,47243E-05	0,005807277	-0,00041458	-0,018603039	0,003211212	0,048812277
Alphabet	Motorola	-0,033153138	-2,615582733	-0,057089845	-2,600411349	-0,094597723	-2,820820676	0,229590566	2,319171883
Alphabet	Waze	-0,003192164	-0,286679413	0,006251878	0,32416135	0,002114262	0,071766382	0,014781129	0,16996286
Alphabet	Nest	0,004534215	0,355689438	0,013783071	0,62424376	0,004697857	0,139289907	0,066540587	0,668329369
Alphabet	Apigee	-0,004487795	-0,417865364	0,001037864	0,055793454	0,014461872	0,508954406	0,077683072	0,926114902
Alphabet	HTC (part)	0,003689102	0,440601597	0,009016816	0,621753101	0,004100436	0,185099997	0,051989101	0,795010354

Figure 3 Table of results

The event study results reported in Figure 3 show that the majority of acquisitions produced statistically insignificant abnormal returns, on the announcement day and across the short event windows (−1,+1) and (−3,+3). Only a small number of the deals generated statistically meaningful reactions. These were primarily seen in the short term windows rather than in the longer (−30,+30) event window. This pattern is consistent

with prior acquisition announcement literature, which often finds weak or mixed bidder returns in acquisition deals.

In the short event windows, the most pronounced statistically significant effects appear in Microsoft's acquisition of Nokia Devices and Alphabet's acquisition of Motorola. The Nokia Devices deal produced strongly negative abnormal returns across all short windows, with CAR(0) = −0,0487 (t = −3,74), CAR(−1,+1) = −0,0789 (t = −3,48) and CAR(−3,+3) = −0,0749 (t = −2,77). Also Alphabet's Motorola acquisition generated significant negative abnormal returns in the same short windows. These were CAR(0) = −0,0334 (t = −2,62), CAR(−1,+1) = −0,0571 (t = −2,60), and CAR(−3,+3) = −0,0946 (t = −2,82). These results indicate that investors initially interpreted both acquisitions unfavourably, possibly reflecting concerns regarding integration complexity or acquisition premiums.

Oracle's acquisition of MICROS Systems also produced statistically significant negative abnormal returns in the short windows, although the announcement-day reaction itself was insignificant. The CAR(−1,+1) = −0,0381 (t = −2,27) and CAR(−3,+3) = −0,0649 (t = −2,52) both indicate short term market skepticism toward the transaction. Oracle's acquisition of Acme Packet showed only weak significance on the announcement day, with CAR(0) = −0,0166 (t = −1,87), which is marginally significant at the 10 percent level but not robust across wider windows.

By comparison, the remaining acquisitions across Microsoft, Oracle and Alphabet produced no statistically significant abnormal returns in the short event windows. In these cases the CAR values remained small and the associated t-statistics stayed well below conventional significance thresholds. This leading to suggestions that investors largely viewed these transactions as neutral in terms of short term shareholder value effects.

The results from the longer event window (−30,+30) differ slightly but still show limited evidence of statistically significant abnormal performance. Among all transactions examined, only Alphabet's Motorola acquisition produced a statistically significant positive CAR over the extended window. It resulted in a CAR(−30,+30) = 0,2296 (t = 2,32). This contrasts with its negative short term reaction and suggests that initial investor concerns may have weakened as expectations regarding the acquisition's strategic benefits evolved.

All other acquisitions remain statistically insignificant in the (−30,+30) window. For example Microsoft's Nokia Devices acquisition, despite its strongly negative short term reaction, produced CAR(−30,+30) = 0,1317 (t = 1,29). Indicating no continuous abnormal performance. Similarly, Oracle's MICROS Systems acquisition and Microsoft's LinkedIn acquisition both show positive but insignificant longer term CARs. Alphabet's remaining transactions the extended window results remain statistically indistinguishable from zero.

The results suggest that the market reactions to technology-sector acquisitions are often complex and evolve over time. While a few transactions generate statistically noticeable reactions in short event windows, most acquisitions generate relatively modest abnormal returns. Usually there acquisitions are interpreted as progressive strategic investments rather than events that fundamentally alter firm valuation. The combined evidence from the CAR and t-statistics therefore indicates that while certain transactions triggered meaningful investor responses, the overall pattern of results does reflect generally moderate market reactions.

6 Conclusions

This thesis set out to examine how financial markets react to merger and acquisition announcements made by large U.S. technology firms in the post-financial crisis period. Using event study methodology, cumulative abnormal returns were computed for fifteen acquisitions conducted by Microsoft, Oracle and Alphabet between 2009 and 2019. The analysis was built around two research questions: whether technology-sector M&A announcements generate positive abnormal returns for acquiring firms and whether the method of payment plays a role in shaping those reactions.

6.1 Overall pattern of market reactions

The results paint a consistent, if somewhat mixed picture. Across the chosen sample, announcement day abnormal returns are moderaete and most fall short of statistical significance at conventional thresholds. This sits within the broader empirical literature on acquirer returns, which has long documented that acquiring firms tend to earn small or statistically weak abnormal returns around the time of announcement. For large and closely followed technology firms the evidence here suggests that acquisitions are not systematically perceived as strongly value creating or value destroying at the moment they are made public.

That said, there is real variation across individual deals. Microsoft's acquisition of Nokia's Devices and Services division stands out as the most pronounced negative reaction in the sample, with a CAR(−1,+1) of approximately −7,87 percent. Oracle's acquisition of MICROS Systems followed a similar trajectory. It had an initial positive reaction on announcement day quickly turning to a CAR(−3,+3) of approximately −6,44 percent. Alphabet’s acquisition of Motorola Mobility generated a negative short term market reaction, consistent with investor uncertainty surrounding the company’s expansion into hardware manufacturing (Reuters, 2011).

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On the other side, several acquisitions attracted broadly neutral or modestly positive responses. Oracle's NetSuite acquisition produced a near zero CAR across all short event windows, suggesting markets had already priced in much of the expected value before the announcement. Alphabet's acquisitions of Waze, Nest Labs and Apigee all produced small abnormal returns with t-statistics well below significance thresholds. Given their scale relative to Alphabet's overall market capitalisation, it is not surprising that they were taken as strategic moves rather than transformative events.

6.2 The role of longer event windows

One of the more interesting patterns in the data is the difference between short term and longer term cumulative abnormal returns. Several acquisitions that triggered negative immediate reactions went on to produce notably positive CAR(−30,+30) values. Microsoft's Nokia acquisition, despite its CAR(−1,+1) of approximately −7,87 percent, recovered to a CAR(−30,+30) of approximately +13,17 percent. A similar course is visible for Alphabet's Motorola acquisition and for Microsoft's LinkedIn and Skype transactions. This points to a pattern where initial investor skepticism was gradually moderated as markets had more time to work through the strategic logic of the deals. The longer window results carry more noise. They should be taken carefully, but the pattern of early negativity followed by reevaluation is consistent with the difficulty of evaluating large technology acquisitions at the moment they are announced.

6.3 Hypothesis evaluation

Regarding to the two hypotheses presented in the thesis, the evidence is mixed. The first hypothesis that technology sector M&A announcements generate positive cumulative abnormal returns for acquiring firms, is not clearly supported by the short window evidence. Most acquisitions produce announcement day and three day CARs that are

either negative or statistically almost zero. The data points toward weak or neutral short term reactions rather than the systematically positive response the hypothesis anticipated. This is consistent with both the broader empirical literature and with the theoretical arguments around managerial overconfidence and agency problems. Neither of them predicts that acquisitions will be reliably welcomed by the market.

The second hypothesis, that cash financed acquisitions generate higher cumulative abnormal returns than stock financed ones, can be descriptively supported but cannot be formally tested given the structure of the sample. Fourteen of the fifteen acquisitions were cash financed, with only Microsoft's GitHub acquisition conducted as an all-stock deal. GitHub produced modest short term positive abnormal returns but slightly negative cumulative returns over wider event windows. Several cash financed transactions did generate positive CAR(−30,+30) values and the overall pattern is at least consistent with the theoretical prediction that cash financing signals managerial commitment. Without more stock financed cases to compare against the hypothesis remains supported cautiously rather than confirmed.

6.4 Theoretical implications

The results connect to several of the theoretical perspectives discussed earlier in the thesis. The generally weak announcement day reactions are broadly consistent with semi strong market efficiency. Information about large and closely followed technology firms is absorbed into prices quickly, which naturally limits the scope for large abnormal returns at announcement. The sharper negative reactions to Nokia and Motorola resonate with both the hubris hypothesis and agency-based explanations. Both deals involved large capital commitments into territory outside the acquiring firm's core capabilities. In both cases investors pushed back clearly in the days surrounding the announcement.

The signaling framework of Myers and Majluf (1984) remains relevant even with only one stock financed observation in the sample. The fact that all major cash acquisitions were carried out by firms with substantial internal resources makes the argument that financing choice in this sector is at least partly strategic more robust. When a firm sitting on considerable cash reserves opts to pay with stock instead as Microsoft did with GitHub, that decision has to be taken cautiously.

6.5 Limitations and directions for future research

The study has some limitations worth noting. The sample is deliberately narrow, covering fifteen acquisitions by three firms over a single decade, which limits how far the findings can be generalised. The number of stock financed transactions also constrains any analysis of financing effects. Future work could address this by drawing on a broader range of technology firms and a wider mix of financing structures, allowing for more meaningful cross sectional comparisons.

The study also focuses exclusively on shorter horizon announcement effects and does not follow the transactions through to their longer term operational or financial outcomes. Combining event study methods with accounting based performance measures could offer a fuller picture of whether these acquisitions ultimately delivered value or not.

6.6 Final thoughts

This thesis contributes to the empirical literature on mergers and acquisitions by offering a focused analysis of market reactions in the technology sector. The results are consistent with the event study literature, which suggests that financial markets incorporate acquisition announcements quickly and that announcement period returns depend

strongly on transaction characteristics such as deal size, payment method and perceived strategic fit (MacKinlay, 1997; Andrade et. al., 2001).

Acquisitions in this sector do not generate uniform shareholder value at announcement, but financing method and strategic credibility are important factors in deciding how markets respond. For investors and corporate managers, that is worth keeping in mind.

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