
Lauri Ruhanen

# Cancelled M&A deals and target shareholder returns

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**Author:** Lauri Ruhanen
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**ABSTRACT:**

This thesis investigates the effect terminated M&A deals have on the share prices of acquisition targets. The share price development is examined up to 20 days before and 20 days after the deal's termination announcement date, due to the findings of previous studies which conclude that prices return to pre-offer levels in the long run. Furthermore, this thesis analyses whether the market response to terminated M&A deals has changed during the 21st century. As the previous research has mainly focused on cancelled transactions in the United States during the 1980s and 1990s, this thesis contributes to the existing literature by studying recent M&A withdrawals in the UK.

The sample of this study covers 42 unsuccessful M&A deals between the years 2004 and 2020 in which the target company was listed in the London Stock Exchange. The investor reaction to M&A termination announcements is studied by calculating the expected and abnormal returns with market model methodology. The expected return of the target companies for each event day is estimated over a period of 120 days. The abnormal returns, which reflect the market response to new and unexpected information, are examined over event windows of various length.

Negative and statistically significant abnormal returns are found around the termination announcement date. Consistent with the results of previous studies conducted in the US, target shareholder returns begin to decline a few days before the announcement but the negative price effect seems to diminish with time, as positive returns are found after the announcement for event windows of +6 to +10, +11 to +15 and +16 to +20 days. On the other hand, the results indicate that the investor reaction to cancelled M&A deals has changed over the recent years. The cumulative average abnormal return of terminated deals between the years 2004 to 2011 is more negative over each event window than the respective return of terminated deals between the years 2012 and 2019.

The findings suggest that the stock market considers M&A termination announcements as major and meaningful events. The returns of acquisition targets decrease significantly around the announcement but begin to recover within a few days after the event. The results also indicate that the London Stock Exchange should not be considered as fully informationally efficient because target returns continue to decrease further on event date +2, thus indicating that the announcement's new and unexpected information is not fully incorporated into share prices immediately after the event.

**KEYWORDS:** M&A, Efficient Market Hypothesis, London Stock Exchange, corporate announcements

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**TIIVISTELMÄ:**

Tämä pro gradu -tutkielma tarkastelee peruuntuneiden yritysjärjestelyiden vaikutusta kaupan kohteena olleen yhtiön osakekurssiin. Kohdeyhtiöiden kurssikehitystä tarkastellaan aikavälillä 20 päivää ennen ja 20 päivää yrityskaupan peruuntumispäivämäärän jälkeen, johtuen aikaisempien tutkimusten tuloksista jotka viittaavat siihen että hinnat palaavat suunniteltua kauppaa edeltävälle tasolle pitkällä aikavälillä. Lisäksi tässä työssä tutkitaan, onko markkinoiden keskimääräinen reaktio peruuntuneisiin yrityskauppoihin muuttunut jollakin tapaa 2000-luvun aikana. Aiempien tutkimusten keskittyessä pääasiassa peruuntuneisiin kauppoihin Yhdysvaltojen markkinoilla 1980- ja 1990-lukujen aikana, tämä tutkielma pyrkii täydentämään olemassa olevaa kirjallisuutta analysoimalla viimeaikaisia epäonnistuneita yritysjärjestelyitä Iso-Britannian markkinoilla.

Tämä tutkimus kattaa kaikkiaan 42 peruuntunutta yritysjärjestelyä vuosina 2004–2020, joissa kaupan kohdeyhtiö oli listattuna Lontoon pörssissä. Sijoittajien reaktioita lehdistötiedotteisiin yrityskauppojen peruuntumisesta tutkitaan laskemalla yhtiöiden odotetut ja poikkeavat tuotot markkinamallimenetelmällä. Kohdeyhtiöiden kunkin päivän odotettu tuotto arvioidaan 120 päivän ajanjakson aikana. Poikkeavat tuotot, joita tutkitaan eripituisten tarkasteluaikavälien sisällä, heijastavat markkinoiden reaktiota uuteen ja odottamattomaan tietoon.

Kohdeyhtiöillä havaitaan negatiivisia ja tilastollisesti merkitseviä poikkeavia tuottoja yrityskaupan peruuntumispäivämäärän tienoilla. Aiempien yhdysvaltalaistutkimusten tapaan kohdeyhtiöiden osakkeen hinta alkaa laskea muutama päivä ennen peruuntumisilmoitusta, mutta negatiivinen hintavaikutus näyttää heikentyvän ajan myötä, sillä osakkeenomistajien tuotot ovat positiivisia tapahtuman jälkeen tarkasteluaikaväleillä +6 ja +10, +11 ja +15 sekä +16 ja +20 päivää. Toisaalta tulokset osoittavat että sijoittajat reagoivat peruutettuihin yritysjärjestelyihin eri tavalla kuin aikaisemmin. Vuosien 2004 ja 2011 välillä peruuntuneiden yrityskauppojen kumulatiivinen keskimääräinen poikkeava tuotto on negatiivisempi jokaisella tarkasteluaikavälillä kuin vuosien 2012 ja 2019 välillä peruutettujen kauppojen vastaava tuotto.

Tulokset osoittavat, että osakemarkkinat mieltävät yrityskauppojen peruuntumisilmoitukset tärkeiksi ja merkittävinä tapahtumiksi. Kaupan kohteena olleiden yhtiöiden tuotot laskevat merkittävästi ilmoituspäivämäärän ympärillä, mutta alkavat palaamaan kohti aiempaa tasoa muutama päivä tapahtuman jälkeen. Tulokset viittaavat myös siihen että Lontoon pörssiä ei voida pitää täysin informatiivisesti tehokkaana, sillä kohdeyhtiöiden tuotot laskevat edelleen peruuntumisilmoituksen jälkeisenä päivänä +2, mikä osoittaa että ilmoituksen sisältämä uusi ja odottamaton informaatio ei välity täysimääräisenä osakekursseihin heti tapahtuman jälkeen.

**AVAINSANAT:** yritysjärjestelyt, tehokkaiden markkinoiden hypoteesi, Lontoon pörssi, lehdistötiedotteet

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## Abbreviations

| | |
|---|---|
| AAR | Average abnormal return |
| APT | Arbitrage Pricing Theory |
| CAR | Cumulative abnormal return |
| CAAR | Cumulative average abnormal return |
| CAPM | Capital Asset Pricing Model |
| EMH | Efficient Market Hypothesis |
| LBO | Leveraged buyout |
| LSE | The London Stock Exchange |
| M&A | Mergers and acquisitions |
| NYSE | The New York Stock Exchange |
| OLS | Ordinary Least Squares |
| R&D | Research and development |

# 1 Introduction

The global mergers and acquisitions (M&A) market has been characterized by record-breaking growth since the financial crisis. In 2018, the total value of M&A deals surpassed 3 trillion dollars for the fifth consecutive year, with the number of completed transactions also increasing almost every year (Deloitte, 2019). The increased M&A activity has been mostly driven by low interest rates, the strong presence of the private equity industry, and companies' heavy cash reserves. However, the high deal volumes have led to more and more deals being withdrawn (Deloitte, 2019; 2020). In light of this finding, the following question arises: why are these deals not completed and more importantly, what are the consequences of the withdrawals?

The reasons for companies to merge or to acquire another business are diverse. One of the motives is to achieve cost advantages through synergies and economies of scale. M&A may be used for diversification by expanding the existing business into new markets or by acquiring firms with new products and services. Companies may also aim to increase their market share by acquiring competitors, often in form of hostile takeovers (Andrade, Mitchell & Stafford, 2001). For example, the proposed merger between elevator manufacturers KONE and ThyssenKrupp would have created the world's biggest lift producer with a market share of roughly 30 % (Financial Times, 2020).

Successful transactions are highly meaningful for the internal and external stakeholders of the participating firms and the society as a whole. Changes in corporate strategy, increased use of debt, and renegotiation of supplier and employee contracts are often associated with takeovers (Jensen, 1988). Completed M&A deals also create value for the companies' shareholders, not only because of takeover premiums but also through the positive market response as noted by studies such as Asquith (1983). On the other hand, there are numerous critics of M&A activity. The criticism is concerned with possible damage to the morale and productivity of the organizations, executives focusing solely on the short-term profits, and rising prices due to reduced competition (Jensen,

1988). To prevent market concentration, regulators have introduced various competition laws.

In addition to the regulatory concerns, Malmendier, Opp, and Saidi (2016) note that price dispute and lack of support from target management are among the main reasons for takeover bids being withdrawn. According to the study, negative news about the acquirer or target has contributed to an increasing number of M&A deals being cancelled recently as companies have placed more emphasis on corporate social responsibility. This is in line with the commonly understood increased importance of social responsibility in the society.

As mentioned above, completed transactions generally yield positive abnormal returns at least in the short run. Now the question remains whether shareholders, especially target shareholders, experience abnormal returns upon cancelled deals. Akhigbe, Borde, and Whyte (2000) suggest that the direct consequences of M&A deal withdrawals are split among the shareholders of the acquiring, target, and rival firms. The failed KONE-ThyssenKrupp merger provides an example of the price effect that could be expected, as both companies' stock prices declined by roughly 5 % on the day the merger cancellation was announced. Nevertheless, this example does not address whether the shareholder wealth effects followed a similar pattern in the long run as well. Therefore, this thesis will also study the possible changes in the target shareholder returns over two longer event windows.

## 1.1 Purpose and contribution of the study

The purpose of this thesis is to examine the effect of M&A termination announcements on the stock prices of acquisition targets. Furthermore, this thesis analyses if the magnitude of the effect diminishes within a few days after the announcement, and whether that magnitude has changed during the 21st century. By studying these questions, important remarks about the market efficiency can be drawn.

To investigate the price effect and the resulting form of market efficiency, event study methodology is employed as proposed by MacKinlay (1997). More precisely, the average and cumulative average abnormal returns are computed for the sample to examine whether termination announcements result in significant abnormal returns for the target shareholders. The methodology is applied for various event windows to study the distribution of abnormal returns around the announcement. With the final sample containing 42 withdrawn M&A deals data from the year 2004 onwards, it can be eventually concluded whether the stock price behaviour of acquisition targets has varied over the 21st century.

The vast majority of previous research on the relationship between M&A deal withdrawals and target stock price behaviour (e.g. Davidson, Dutia, & Cheng, 1989; Fabozzi, Ferri, Fabozzi, & Tucker, 1988; Sullivan, Jensen, & Hudson, 1994) focuses on companies that are listed on the U.S. stock exchanges. Most of these studies have been performed during the 1980s and 1990s. By focusing on recent M&A withdrawals in the UK, this thesis contributes to the existing literature by providing an up-to-date analysis of the market efficiency of the London Stock Exchange, one of the largest exchanges in the world.

## 1.2 Research hypotheses

As the purpose and contribution of the thesis have been defined, the research hypotheses can be formulated. The null hypothesis and the first, alternative hypothesis follow the previously conducted research by Akhigbe et al. (2000) and Dodd (1980). These studies find evidence that target shareholders generally experience significant abnormal returns after merger termination announcements, but the results are mixed regarding whether the abnormal returns are positive or negative. $H_0$ and $H_1$ are formed as follows:

$H_0$: M&A termination announcements do not affect the stock prices of acquisition targets.

$H_1$: M&A termination announcements do affect the stock prices of acquisition targets.

The second research hypothesis is related to the first hypothesis and replicates a study by Davidson et al. (1989) which examines the returns of acquisition targets over short and long intervals. The researchers conclude that target share prices return to pre-offer levels within 90 to 250 days after the announcement. The existing literature has not addressed whether the investor response to M&A termination announcements has varied during the 21st century, and therefore the third hypothesis aims to investigate this question. $H_2$ and $H_3$ are written as follows:

$H_2$: The price effect of M&A termination announcements begins to decrease within a few days after the event.

$H_3$: The negative market reaction to M&A termination announcements has diminished over the recent years.

A study by Andrade et al. (2001) shows that the abnormal returns of acquisition targets around the initial merger announcement were slightly more negative over the years 1973-1989 than during the period 1990-1998. While these findings provide support for $H_3$ to hold, the theory of efficient capital markets suggests that $H_1$ could be accepted. The theory states that stock prices should always reflect all available information, and thus any new information that affects the firms' future earnings prospects will be incorporated into the prices immediately (Fama, 1965, 1970). Given this theory, investors should react to M&A termination announcements immediately once published and the reaction should affect the share prices. $H_2$ is supported by the argument that investors tend to overreact to new information, at least over the short term (De Bondt and Thaler, 1985; 1987). The resulting assumption is that the price effect caused by the announcements does not remain significant over the long term.

## 1.3 Structure of the thesis

The thesis is structured as follows: the second chapter will introduce the topic of mergers and acquisitions. The chapter discusses the concepts relevant to M&A, such as different types of M&A, merger waves, and motives for acquisitions. Furthermore, the critical success factors behind M&A deals are covered to clarify why some deals are not completed. Chapter three presents the theoretical background essential to the empirical part of the thesis, including theories of asset pricing and market efficiency. The fourth chapter reviews the previous studies about M&A announcements. The data and methodology are presented in the fifth chapter, while chapter six presents and analyses the results obtained from the empirical analysis. The seventh chapter of the study summarizes the findings of the thesis and provides suggestions for future studies.

# 2 Mergers and acquisitions: an overview

The purpose of this chapter is to introduce the topic of mergers and acquisitions. This chapter follows the same sequence as a typical M&A process, with the theoretical background such as merger waves and what drives the company's decision to enter into a transaction being addressed first and then proceeding to different types of M&A deals. The final part of this chapter reviews the factors that determine whether the deal will be successful, helping the reader to understand why some deals are eventually terminated.

## 2.1 Merger waves

Historical acquisition data shows that M&A activity is remarkably cyclical. Previous studies have found a total of six merger waves, with the first wave occurring in the 1890s (Brealey, Myers, & Allen, 2011; Gaughan, 2012). While the sixth wave came to an end due to the financial crisis, the most recent period of increased M&A activity began in 2013 (Deloitte, 2018). Most of the merger waves follow a similar pattern as the sixth wave, even if the underlying causes may vary. M&A activity increases when the overall economic development is favourable, i.e. after a recession. The volume of transactions reaches its peak simultaneously with the stock market.

The first two periods of high M&A activity were characterized by horizontal and vertical mergers (Gaughan, 2012, pp. 30-39). Companies started to acquire firms in other industries during the third merger wave (1965-1969), while leveraged buyouts (LBOs) and the increased use of debt financing made the fourth wave between 1984-1989 unique (Gaughan, 2012, pp. 40-59). According to Gaughan, the number of large transactions and cross-border acquisitions describe the M&A wave of the 1980s and the fifth wave of 1990s. During the sixth wave that started in 2003, deal volumes once again surpassed the previous records (Brealey et al., 2011, pp. 814-815).

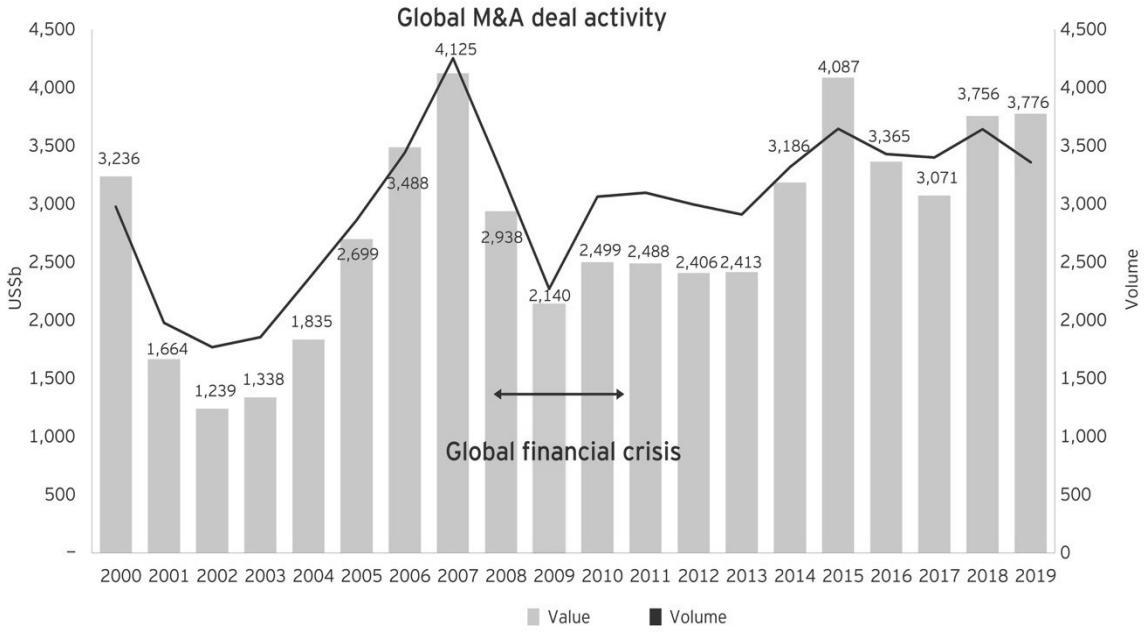


**Figure 1.** Global M&A activity in the 2000s (Ernst & Young 2020).

The current literature offers diverse explanations for merger waves. Martynova and Renneboog (2008) as well as Harford (2005) suggest that economic, regulatory, and technological shocks lead to industry-wide merger waves. Changes in the competition legislation, the introduction of new technological solutions, and greater capital liquidity result in such shocks that ultimately lead to an increased amount of takeover and merger bids within the industry. Harford finds that when the amount of M&A deals increases in multiple industries at the same time, the larger aggregate merger waves are formed.

On the other hand, Rhodes-Kropf and Viswanathan (2004) show that incorrect valuation of assets has an impact on M&A activity. Takeover offers reflect the expectations of the target management more precisely during periods when assets are generally overvalued, which increases the likelihood of the deal being successful. Whereas in an undervalued market, it is more likely that the target management does not consider the takeover bid being sufficient. Rhodes-Kropf and Viswanathan conclude that these findings result in occasional increases and decreases in the overall level of M&A activity.

## 2.2 Motives for M&A deals

The current academic literature suggests that diversification and synergy benefits are the most common motives for companies to engage in M&A deals. Gaughan (2012, p. 117) notes that tax motives, improved management, investments in research and development, and a theory of hubris hypothesis are among the other reasons for mergers and acquisitions. Even though the determinants of each acquisition are different, the underlying idea is the same: the transaction should be completed only if the combined value of the companies is higher than what they were worth apart (Brealey et al., 2011, p. 792). However, many deals that may seem to enhance efficiency or profitability at first might yet destroy value. In the next subchapters, merger motives are categorized as either value-increasing or value-decreasing, similarly to a study by Nguyen, Yung and Sun (2012).

### 2.2.1 Value-increasing theories

The synergy motive is built on the assumption that merging companies can achieve economic gains, also known as synergies, when they consolidate assets. Because firms aim to maximize shareholder wealth and synergy-increasing acquisitions create value, at least in theory, the resulting conclusion is that both acquirer and target shareholders experience positive gains whenever the takeover is motivated by synergies (Berkovitch & Narayanan, 1993). The authors argue that value-destroying acquisitions would not exist if synergies would always be the sole reason for M&A deals. Synergy benefits can be divided into two categories: operating synergies and financial synergies. Operating synergies are generated when a company increases its sales or manages to reduce costs through a merger, while a lower cost of capital is an example of financial synergy (Gaughan, 2012, pp. 124-125).

Shareholders expect companies not only to create profits but also to achieve constant revenue growth. However, obtaining continuous internal growth is often difficult for companies operating in more mature industries, which is why diversification into new

markets or products might become an attractive option (Gaughan, 2012, pp. 119-120). Gaughan presents the international expansion of a firm as an example of using diversification to enhance growth. He argues that while the firm builds its future growth and higher cash flows by entering into a new market, the company's existing business also becomes more predictable, i.e. less dependent on one market's development. The same principles hold for diversification into new services and products, and investments in research and development (R&D), which is why Gaughan (2012, pp. 118-119, 164) describes acquisitions, mergers, and strategic alliances as the fastest and low-risk alternatives for seeking growth.

Mukherjee, Kiymaz, and Baker (2004) conduct a survey of 75 CFOs to investigate merger motivation and note that managers do not actually hold growth as a major reason for diversification. The survey finds that CFOs see diversification primarily as an attempt to reduce losses when the demand for the company's existing products and services decreases. According to the paper, the other benefits of diversification include a better competitive position, more efficient allocation of resources, and a smaller probability of bankruptcy. Additionally, Mukherjee et al. suggest that diversification reduces the company's cost of capital, as investors find the company less risky which leads to a decrease in the required risk premium. Misallocation of capital, on the other hand, can destroy value if firms use diversification solely as a means of merging unprofitable product or service lines.

Gaughan (2012, p. 165) argues that a significant amount of M&A deals are motivated by tax benefits and more precisely, by interest tax shields that create financial synergies for the companies involved. Devos, Kadapakkam, and Krishnamurthy (2009) examine this subject by analysing 264 mergers in the US during 1980-2004 and show that merging companies do not achieve significant interest tax shields. For their sample, financial synergies through tax shields comprise only 1,6 % of the average synergy gain of 10 %. Devos et al. conclude that the role of tax advantages as a source for merger benefits is much smaller than anticipated and that improved allocation of resources explains most of the gains.

### 2.2.2 Value-decreasing theories

According to Shleifer and Vishny (1989), two common merger motives can be described as value-decreasing, because managers' personal objectives act as the motivation for these transactions. As a result, the deals often reduce the value of the acquiring firm. Theory of improved management, also called the agency motive, is one of the two motives. The agency motive assumes that acquirer management wants to increase its own welfare at the expense of the company's shareholders (Berkovitch et al., 1993). As an example, Berkovitch et al. suggest that acquirer management will only search for target companies which operate in industries that are within the management's area of expertise. Gaughan (2012, p. 163) concludes that the outcome of the agency motive is that the acquirer management can emphasize their worth and ability to the shareholders, regardless of whether the transaction actually creates value.

Hubris hypothesis of Roll (1986) is the other often-cited explanation for value-destroying M&A deals. The hypothesis states that acquisitions occur due to overvaluation by the acquirer management. Roll argues that managers' valuation is incorrect due to the pride of the management and not because of insufficient knowledge. If the hubris hypothesis holds, all of the synergy gains that the transaction might create will be lost, as incorrect valuation will result in an acquisition price that is substantially higher than the market value of the target company (Berkovitch et al., 1993). Dodd (1980) studies whether the hubris hypothesis is found in practice and shows that there is a significant decline in the acquirer's stock price after the initial M&A announcement. He claims that the findings confirm the presence of the hubris hypothesis because the falling stock price indicates the response of the market to the planned takeover: the acquisition does not benefit the acquirer shareholders as it destroys shareholder value. However, Berkovitch et al. provide evidence that despite Dodd's findings, most of the value-destroying transactions are motivated by the agency motive and not by the hubris theory.

## 2.3 Types of M&A

After the acquirer has clarified the reasons why it should proceed with the planned transaction, the next step in the process is to identify the potential target companies. Mergers can be classified into three different categories, based on the type of relationship between the merging companies. The deal is considered a horizontal merger when the acquirer and the target firm are competitors, thus operating in the same industry. The previously mentioned KONE-ThyssenKrupp bid would be an example of a horizontal merger. Horizontal mergers are often not completed because of their possible effects on the competition within the industry (Gaughan, 2012, p. 13). Regulators may apply competitive legislation to intercept the merger in the case the deal would transfer a significant amount of market power to the new consortium. Approximately 50 % of the failed acquisitions covered in this thesis are horizontal transactions.

A vertical merger occurs within the company's supply chain. By entering into a vertical merger, the acquirer is aiming to expand its current operations to a line of business in which the firm has some existing knowledge (Brealey et al., 2011, p. 792; Gaughan, 2012, p. 13). The merger sample of this thesis includes a planned vertical deal between technology manufacturer Telephonetics PLC and software provider Eckoh PLC in 2008. While horizontal and vertical mergers involve firms that are highly related, in a conglomerate merger the companies are not competitors and do not operate in the same industry (Gaughan, 2012, pp. 13-14). Brealey et al. note that acquirers prefer horizontal and vertical transactions today, even though conglomerates were the more common option in the past. Each of the three merger types can be used to acquire not just domestic, but also foreign partners and rival firms. Gaughan (2012, pp. 120-121) concludes that international M&A deals, also known as cross-border acquisitions, offer an inexpensive way to enter into a new market.

## 2.4 Pre-acquisition success factors: why are some deals terminated?

A thorough due diligence process, appropriate valuation, transparent communication, cultural differences, and competition legislation are among the factors the acquirer has to consider before it may proceed with the transaction. Gomes, Angwin, Weber, and Yedidia Tarba (2013) find that identifying these critical success factors is an important part of the acquisition process, while the company's ability to manage the transition from pre-acquisition to post-merger phase will eventually determine whether the transaction is successful or not. Gomes et al. continue by suggesting that information asymmetry is a key issue in the acquisition process, as the acquirer and the target company have to make choices and decisions based on insufficient and imprecise information. Information asymmetry can ultimately result in an acquisition that fails to create value or in an acquisition that will not even be completed, as displayed by Cartwright and Schoenberg (2006) who report continuing high levels of unsuccessful M&A deals during the last three decades.

As it is essential to understand why some deals are terminated and why the amount of unsuccessful transactions has consistently remained high, the following chapters introduce the above-mentioned critical success factors and the links between them in more detail.

### 2.4.1 Due diligence

Angwin (2001) explains that the acquiring firm should take aspects such as possible future investment requirements and the competence of the target's management team into account already when searching for acquisition targets, while the actual due diligence process begins once a confidentiality agreement has been signed. Whereas the acquirer's initial opinion on the target company is solely based on publicly available information, the confidentiality agreement authorizes the acquirer to access private and confidential information about the target's operating performance, contracts as well as agreements with third parties, and financial estimates (Skaife & Wangerin, 2013). Skaife

and Wangerin note that the target due diligence team also focuses on any ongoing R&D projects, target management's forecasts and reports, and interviews the target's employees to examine the economic and market outlook for the target company.

Low-quality financial data may affect the probability of the deal being completed even if the information is not incorrect, as shown by Skaife and Wangerin. They calculate a financial reporting score for each target company and find that having a high amount of off-balance sheet assets and liabilities as well as accruals is positively correlated with less reliable and low-quality financial information and internal control problems. The results of the study indicate that companies with such imprecise financial reporting are more likely to be involved in unsuccessful transactions than companies that publish accurate financial information.

### 2.4.2 Valuation

The role of valuation in the acquisition process is significant from the acquirer's point of view, as overpaying for the target may lead either to a value-destroying acquisition or to a transaction that will not accomplish its required return (Gomes et al., 2013). On the other hand, the target company will not likely accept undervalued bids and expects that the purchase price includes a takeover premium. Thus defining an appropriate price largely determines whether the acquirer will reach a consensus with the target management. Gomes et al. find that discounted cash flow model, comparable company analysis, and analysis of precedent transactions are the main methods for valuing an acquisition target, with dividend based models and residual income valuation being used less frequently. Moreover, Gomes et al. estimate that a major proportion of unsuccessful transactions (i.e. acquisitions that do not achieve their objectives) is due to miscalculated takeover premiums. The results of their study suggest that the errors in valuation are due to a shortage of crucial information, that is, information asymmetry which even a thorough due diligence process cannot solve.

### 2.4.3 Competition law

An extensive amount of national legislation focuses particularly on mergers and acquisitions. In the United States, regulators monitor mergers through the securities law, state corporation laws, and the antitrust law (Gaughan, 2012, p. 100). The antitrust legislation is designed to prevent firms from executing anti-competitive transactions. The Sherman Antitrust Act of 1890 and the Clayton Act of 1914 form the basis for the antitrust regulation in the United States, and the underlying idea of these laws is to interrupt any transactions that aim to create a monopoly or reduce competition (Gaughan, 2012, p. 100).

The European Union introduced its competition legislation in 1990. According to Gaughan, the regulations are applied to all mergers and joint ventures that involve companies from at least two different countries and may affect the industry's degree of competition in those countries. For mergers within the EU, any controversial transactions are addressed by the European Commission, while the US competition law requires a court order to prohibit a merger. Brealey et al. (2011, p. 806) note that companies often cancel their merger plans already when the probability of governmental intervention begins to increase. The authors explain that the pressure from politicians and activists leads to abandoned mergers even when the transaction is acceptable from the competition law's point of view. However, Brealey et al. (2011, pp. 805-806) conclude that even though a merger could be considered anti-competitive by the regulators at first, the transaction might still proceed if the companies are willing to divest certain assets and operations.

### 2.4.4 Cultural fit

Weber (1996) examines the relationship between cultural differences and merger proposals and shows that the future financial performance of the acquirer, as well as the probability of a successful deal, declines whenever there are significant cultural differences between the two companies. In addition to the weak financial performance,

Weber finds that the employees of target companies often experience a drop in productivity, misunderstandings, and disagreements because of cultural differences. Due to this inadequate cultural fit, the managers and employees at the target firm may become less committed to the acquisition process which in turn increases the likelihood of the acquisition being a value- or efficiency-destroying transaction. Therefore Weber emphasizes the role of the acquirer management in managing cultural differences and disagreements during the integration process and creating a feeling of unity within the new consortium. Weber suggests that the degree of cultural fit should be taken into consideration already when searching for acquisition targets, along with the financial and strategic aspects.

### 2.4.5 Communication

Transparent and accurate communication is the key to managing cultural differences and employee uncertainty when acquiring another business, as suggested by multiple academic studies. Bastien (1987) conducts interviews with 21 managers in three acquired companies and shows that managers are mostly concerned about a loss of control and power to the acquirer management, while just a few managers expressed concerns about their future career prospects. Interestingly, the managers in each target company experienced increased uncertainty during different phases of the acquisition process. Managers at the first acquisition target noticed most uncertainty and lack of motivation just before the acquisition was completed, while the post-transaction integration process was considered as the most stressful period by managers in the second target company. As for the third target company, the acquiring firm eventually withdrew the takeover bid which created anxiety among the target management. According to Bastien, the reactions and attitude of employees at the acquisition target can be effectively controlled and managed through clear communication by the acquirer management. Precise communication throughout the acquisition process ensures that target employees are interested in the transaction.

Teerikangas (2012) obtains differing results when she studies the reactions of target company employees for eight acquisitions by Finnish multinational companies. During the pre-acquisition phase, the employees in six acquisition targets expressed motivation instead of uncertainty towards the acquisition. The positive reaction was largely due to the target firm management's active participation and communication throughout the acquisition process, and thus employees at the acquisition targets did not consider the transaction as a threat, but rather as an opportunity. Teerikangas concludes that the behaviour and involvement of the acquirer management team alone does not guarantee that employees at the target company will show interest towards the acquisition. Instead, it is the communication and motivation of the target management that determines whether the employees will strive for a successful integration.

# 3 Theoretical framework

As the theoretical background of mergers and acquisitions has now been covered, this chapter will provide the reader with additional knowledge to understand the methodology of this study, by presenting the theoretical framework of financial markets. The Efficient Market Hypothesis and asset pricing models are introduced to clarify the risk-return relationship of stocks and the reaction an unexpected corporate announcement could have on another company's share price, thus providing a foundation for the empirical results of this thesis.

## 3.1 Efficient Market Hypothesis

Capital markets seek to allocate resources as efficiently as possible, that is, to companies which have the highest potential earnings. To ensure a smooth and efficient allocation of capital, market participants must have access to accurate information about the companies' earnings prospects (Bodie, Kane, & Marcus, 2014, pp. 5–8). The Efficient Market Hypothesis (EMH) by Eugene Fama (1970) is built on this assumption of information availability. According to the EMH, companies' stock prices always reflect all available information and therefore the markets can be considered as informationally efficient. Bodie et al. note that if the markets are efficient and thus stock prices change only when new information becomes available, it should not be possible for an individual investor to achieve risk-adjusted returns that are constantly higher than the average performance of the market.

The previous research on informationally efficient markets is analysed by Fama (1970) from three different aspects. He addresses studies that examine the weak form of market efficiency first before discussing studies that cover the semi-strong form, with studies that test the most advanced (strong) form of efficiency being reviewed last. The weak form of EMH suggests that current share prices reflect all historical market data, including recent prices. Tests of the EMH's semi-strong form examine whether stock prices contain all publicly available information such as earnings forecasts, while studies

of the strong form analyse if stock prices reflect all existing and relevant information, including insider information. Fama finds evidence that stock prices contain the information proposed by the weak and semi-strong forms of the EMH. When new information becomes available, the market reacts immediately and as a result, the information is incorporated into stock prices efficiently. Fama concludes that the assumption of stock prices reflecting insider information is primarily theoretical and thus the findings of the study do not provide support for the strong form of the EMH to hold.

Fama (1970) further argues that stock prices increase and decrease unpredictably because the prices react to new and unexpected information. This argument reflects the findings of Fama's previous study in 1965, which analysed six years of daily price data for 30 stocks that were included in the Dow Jones Industrial Average. The results of the study provide evidence that stocks' consecutive price changes are unpredictable and independent, and therefore a company's historical price data should not be considered as an indication of its future price development. As stock price movement occurs only when new and unexpected information is revealed, Fama's theory of stock prices' random walk should hold whenever the assumptions of the EMH are valid (Bodie et al., 2014, pp. 350-351).

The more recent research on the EMH includes a study by Fama (1991), which discusses how the market efficiency could be tested for return predictability, event studies, and private information rather than testing it for the weak, semi-strong and strong forms. Fama shows that instead of testing the Efficient Market Hypothesis directly, the previous studies on market efficiency use various asset pricing models to test whether markets are informationally efficient. He further argues that it is impossible to apply direct tests to the EMH. Fama's review of previous research finds that by testing market efficiency for the predictability of returns, the future returns can be at least partially estimated. The findings of the research that tests event studies for daily returns provide clear evidence on market efficiency. For any events that have an exact date of occurrence and a large effect on prices, such as merger announcements, event studies show how effectively and quickly prices react to the new information.

Moreover, Fama (1991) argues that previous research has yet been unable to explain whether stock prices include private information. A more recent study by Aboody and Lev (2000) tests market efficiency by examining the relationship between insider gains and companies' R&D activities. Their findings indicate that high insider returns correlate with high investments in R&D. Aboody and Lev conclude that the exploitation of insider information on R&D activities generates information asymmetry and contributes to the inefficiency of the markets.

The criticism of the EMH focuses on the market participants' incentives to reveal new information and the irrational behaviour of investors (e.g. Grossman & Stiglitz, 1980; Malkiel, 2003). Grossman and Stiglitz emphasize that markets cannot be perfectly efficient, as there is usually a cost associated with acquiring new information. The resulting conclusion is that stock prices do not reflect all relevant information, because the free distribution of new information to the market would mean that individuals are not compensated for obtaining and revealing this information. Thus Grossman and Stiglitz argue that there is a fundamental conflict between the incentives to publish information and the objective of having informationally perfect markets. Based on the findings, the authors construct a new model to replace the EMH. Their model assumes that market participants disclose only some of their information to the market, to ensure that there is an incentive for arbitrageurs and other individuals to obtain new information. The degree to which the markets and prices reflect information is directly related to the number of individuals that acquire the new information.

Malkiel's research is concerned with errors in investors' behaviour and assumptions. The underlying idea of his criticism is that individuals do not always behave rationally, and as a result, the expectations of the market participants can be incorrect or inaccurate. Malkiel concludes that the irrational behaviour of investors is the major reason for the mispricing of securities and the short-term predictable patterns in returns.

## 3.2 Asset pricing models

The purpose of an asset pricing model is to find the expected return for a security given its risk (Bodie et al., 2014). This chapter presents three common asset pricing models: the Capital Asset Pricing Model, the Fama-French three-factor model, and the Arbitrage Pricing Theory.

### 3.2.1 Capital Asset Pricing Model

Introduced by Sharpe (1964) and Lintner (1965), the Capital Asset Pricing Model (CAPM) is the first asset pricing model that considers the security's risk-return relationship. Lintner explains that the idea of the CAPM derives from attempting to appropriately measure risk, the market price of risk, and the equilibrium prices of risky stocks. Fama and French (2004) present the formula of the CAPM as follows:

$$E(R_i) = R_f + [E(R_m) - R_f]\,\beta_{iM} \quad (1)$$

In this equation, $E(\mathrm{R}_i)$ is the expected rate of return for asset i, $R_f$ is the risk-free interest rate, while the two components in brackets denote a risk premium which is multiplied by the asset i's market beta $\beta_{iM}$. The risk premium is computed as the difference between the expected market return $E(\mathrm{R}_m)$ and the risk-free rate. The beta coefficient of asset i is an indicator of the asset's systematic, non-diversifiable risk for which the investors require a premium (Bodie et al, 2014, p. 259). The remaining part of the asset's total risk is known as the unsystematic or diversifiable risk.

The CAPM relies on several unrealistic assumptions about the market fundamentals and behaviour of investors, which is why the model should be perceived primarily as a theoretical representation of asset pricing on the capital markets. The assumptions suggest that investors are rational and aim to maximize their return given the risk of the investment, while the investors also have homogeneous expectations. Furthermore, the CAPM argues that the investment horizon is similar to all investors, all information is simultaneously available to each market participant, and there are no taxes or

transaction costs in the capital markets. All securities are also traded on public exchanges, short selling is possible, and investors may borrow and lend unlimited amounts at the same risk-free interest rate (Bodie et al., 2014, pp. 303-304).

### 3.2.2 Fama-French three-factor model

A study by Fama and French (1992) examines various factors that could affect the average returns of listed companies and shows that the risk-return assumption of the CAPM fails to explain the variation in the returns. The authors find that variables of size and book-to-market equity account for most of the variation together with the beta proposed by Lintner and Sharpe. The three-factor model by Fama and French (1993) employs three common stock market risk factors to explain the average stock returns, with a market factor being introduced in addition to the previously mentioned size and value (book-to-market) variables. The formula of the three-factor model is presented below.

$$E(R_i) = R_f + \beta_{ni}\left(R_m - R_f\right) + \beta_{ni}SMB + \beta_{ni}HML \quad (2)$$

Similarly to the CAPM, $E(\mathrm{R}_i)$ denotes the expected rate of return for asset i, $R_f$ is the risk-free interest rate, while $\beta_{ni}$ describes the sensitivity of the asset to the market $\left(\mathrm{R}_m - \mathrm{R}_f\right)$, size ($SMB$), and value ($HML$) variables (Fama & French, 1993). The logic behind the market factor is the same as in the CAPM, as the variable captures the market portfolio's excess return over the return provided by the risk-free rate. Both the size and value factor measure the difference between the average returns of two portfolios (small market capitalization stocks minus large market capitalization stocks, and value stocks minus growth stocks). Fama and French note that the size factor is based on the findings of previously conducted research: the earnings of companies with small market capitalization are consistently lower than the earnings of bigger companies. On the other hand, the value factor demonstrates the inverse relationship between profitability and the book-to-market ratio, as companies with a low book-to-market ratio typically report higher earnings than companies with a high book-to-market ratio.

### 3.2.3 Arbitrage Pricing Theory

The Arbitrage Pricing Theory (APT) was developed by Stephen Ross to provide another alternative to the Capital Asset Pricing Model. The APT aims to model an asset's expected return and risk similarly as the CAPM, while the assumptions of the APT are different (Ross, 1976). Bodie et al. (2014, pp. 327-333) argue that the key concept of the APT is that the markets are not perfectly efficient. They summarize the APT's three main assumptions as follows: a factor model can be employed to describe the returns, the markets efficiently eliminate any arbitrage opportunities, and there are enough securities available to create a portfolio with no diversifiable risk.

While the CAPM assumes that the expected return of an asset is dependent exclusively on the systematic risk and the risk-free rate, the APT introduces multiple risk factors into the equation. Bodie et al. (2014, pp. 334-340) note that even though Ross does not specify the factors, the underlying idea is that two securities with similar sensitivity to the factors should have identical expected returns.
The APT is expressed in the following form:

$$E(R_i) = R_f + \beta_{ni} f_n + \beta_{ni} f_n + \ \dots\ , \tag{3}$$

where the expected return of an asset is composed of the risk-free rate $\mathrm{R}_f$ and the systematic risk factors. $\beta_{ni}$ describes the asset i's sensitivity to each factor $f_n$.

# 4 Literature review

This chapter will discuss previous studies on M&A and shareholder returns. However, previous literature about the market reaction to unexpected corporate announcements will be introduced first as it is essential to understand that Malkiel's (2003) and Markowitz' (1952) assumption about investors' rational behaviour might not always hold. The rest of this chapter reviews academic research on the target shareholder wealth effects in two different occasions: initial M&A announcements and M&A termination announcements. Examining studies about the stock price movement in each of the two scenarios will allow to compare the differences not only between previous studies but also with respect to the results of this thesis.

## 4.1 Market reaction to unexpected corporate announcements

De Bondt and Thaler (1985) begin their study by claiming that most people have a psychological tendency to overreact once unexpected news is published. The study investigates whether such behaviour is also seen among individual investors and the consequences this phenomenon has on the stock market. The results of the study suggest that market participants, such as analysts and economic forecasters, overweight recent information and underweight prior data, thus providing support for the overreaction bias. De Bondt and Thaler explain that the effect has a significant impact on the share prices, indicating that the release of unexpected news and announcements reveals previously unknown and substantial market inefficiencies.

Rozin and Royzman (2001) argue that in addition to the overreaction bias, another similar phenomenon called the negativity anomaly exists. They note that the negativity anomaly simply means that there is a difference in how individuals react to negative and positive news: negative events affect each person's attitude more than positive events do. Galil and Soffer (2011) examine the investor response to changes in corporate credit ratings and conclude that the negativity anomaly is clearly detected in the credit default

swap market, as spreads change abnormally after negative rating announcements while positive rating announcements do not follow a similar pattern.

Groening and Kanuri (2018) study the link between firm value and corporate social responsibility and find support for both the overreaction and negativity bias. Unexpected news about corporate activities that are considered irresponsible result in increased trading volatility and a decrease in stock value for that particular company. In comparison, news about responsible social activities do affect the stock value positively but the price effect is smaller than for the negative (irresponsible) events (Groening & Kanuri, 2018).

Finally, Rosen (2006) examines the effects of merger announcements on the acquiring firms' stock prices. As merger plans are available to only insiders before the initial announcement, the announcements can be described as unexpected and new information. Rosen finds that the market response to the merger announcements is typically positive in the short run, as bidders' stock prices experience a significant increase. However, acquirer stock returns are reversed in the long run, indicating that M&A announcements could reflect the overreaction bias. At the end of this chapter it will be reviewed if similar investor sentiment is found for the M&A target companies, and whether the negativity anomaly occurs in cancelled M&A deals.

## 4.2 M&A announcements and target returns

Asquith (1983) investigates the relationship between merger announcements and abnormal returns for 211 NYSE listed target companies between the years 1962 and 1976. The expected rate of return for each firm is estimated by forming a control portfolio that has the same beta as the company. The results show that target companies earn an average excess return of +6,6 % over the announcement date and the previous day. Asquith interprets the findings as follows: target firms experience positive and significant average excess returns because the announcement increases the probability of a successful merger. The findings also provide evidence on market efficiency, as the

share price of the target company should instantly change due to an increase or decrease in the probability of the merger if the markets are efficient. The results suggest that such reaction does occur, and this particular market can be therefore be considered as an efficient capital market. Asquith concludes that most merger targets are predicted to be subject to a takeover bid already before the initial merger announcement, and as a result many of the previous studies have underestimated the actual market response to merger announcements.

Interestingly, a study by Goergen and Renneboog (2004) finds that target companies in the UK earn higher announcement returns than target companies in other European countries. The authors calculate cumulative average abnormal returns (CAARs) of the 1990s M&A wave to examine shareholder wealth effects. The CAAR for all target firms is 9 % over the announcement date and the previous day, while for event windows of -40 to 0 days and -60 to +60 days, CAARs of 23 % and 21 % are found. Furthermore, Goergen and Renneboog argue that when the target firm is from the UK, the abnormal returns are almost two times higher than for Continental European targets. This difference is statistically significant and equivalent for each of the event windows. Other findings of the study include a larger positive announcement reaction for cash-financed offers, friendly acquisitions, and domestic bids than for stock offers, hostile takeovers, and cross-border deals.

Knapp (1990) applies an event analysis to study the share price effects of nine proposed US airline mergers in 1986. The merger announcement date is defined as the first day the merger was mentioned in the Wall Street Journal. To minimize the effects of possible information leakages before the initial announcement, the study uses event windows of various length. Knapp finds significant positive abnormal target returns of around 25 % surrounding the merger announcement, with most of the positive returns being generated in the 20-day period before the announcement, thus indicating some leakage of information. After the exact details of each merger proposal were announced in the Wall Street Journal, negative but insignificant abnormal returns were noted within a subsequent period of 10 trading days.

Another paper by Keown and Pinkerton (1981) discusses the information leakage hypothesis more thoroughly. The study uses daily holding period returns for a sample of 194 target firms to measure excess returns that are earned prior to the public merger announcement. To examine whether trading on insider information actually occurs, pre-announcement abnormal returns of listed companies are compared to returns of unlisted companies. The results of the study suggest that trading on private information, such as forthcoming mergers, is common. Because corporate management cannot trade on insider information as it is illegal to do so, Keown and Pinkerton claim that the information is leaked to third parties who then exploit it. According to the findings, trading on insider information begins approximately one month before the initial announcement, as shown by the continuous increase in both trading volume and the target share price. In addition, the authors show that half of the abnormal returns are already generated before the initial merger announcement. The market reaction on the announcement day covers most of the remaining increase in the target share price, as only 5 % of the increase occurs on the following day.

## 4.3 M&A termination announcements and target returns

Davidson, Dutia and Cheng (1989) investigate the market reaction to failed mergers over the years 1976-1985 for US acquisition targets. The study uses an estimation period of 200 days and event windows of -90 to +90, -5 to +5, and -90 to +250 trading days. The sample consists of 163 mergers, with the majority of the deals being cancelled by the acquirer or the government. A market model is employed to predict the expected returns for the target companies, and abnormal returns are computed with a cumulative prediction error technique that simply subtracts the expected return from the actual return for each firm. The findings of the study suggest that the magnitude of the price effect depends on the actor of cancellation. When the target company terminates a merger, the company experiences positive and statistically significant returns over the long interval, even if the reaction by the market is negative on the first day after the termination announcement. When the acquiring firm cancels a merger, there is no

significant effect on the share price of the target over the short interval. Eventually, the target share price returns to previous levels within 90 to 250 days after the termination announcement. For mergers cancelled by the government or other parties, no significant price effects are found.

Fabozzi, Ferri, Fabozzi, and Tucker (1988) review target shareholder returns following unsuccessful cash and stock tender offers between 1977 and 1983. In the study, an offer is considered unsuccessful if the acquirer withdrew the bid due to not receiving the requested amount of shares. The returns are examined for a period of one year after the offer's withdrawal. Any targets that received subsequent offers were excluded from the final data set of 21 failed offers. Similarly to the study by Davidson et al. (1989), Fabozzi et al. use a market model to estimate the expected returns and then compute cumulative average abnormal returns for each event window. The authors did not find significant abnormal returns after the withdrawal date, as all average abnormal returns for the sample yielded effectively zero. The tender offer's premium to the target shareholders disappears completely due to the public withdrawal, eliminating the offer's positive impact. As the main reasons for the cancellations of the tender offers include governmental intervention and resistance by the target management, Fabozzi et al. conclude that firms may become undesirable targets after unsuccessful offers and therefore it is not surprising to see the offer premiums disappearing.

One of the oldest and most cited publications is written by Dodd (1980). The paper analyses the reaction of the NYSE to 80 cancelled merger proposals between the years 1971 and 1977. Dodd addresses the market reaction to terminated bids by estimating returns with a market model for a period of 300 days. The results suggest that target shareholder returns are negative in the short run, i.e. after the termination has been announced. When the long-term effects of the cancellations are examined, Dodd finds that target companies enjoy abnormal and statistically significant positive returns of 4 %. According to the paper, the negative effect of the termination announcement is not large enough to void the earlier positive response to the original merger announcement and consequently, the target returns remain positive over the long run.

Similar short-run price effects are discovered by Akhigbe, Borde and Whyte (2000) when they research terminated mergers of NYSE listed companies for the period from 1987 to 1996 with event study methodology. Akhigbe et al. introduce three hypotheses to demonstrate the implications of merger termination announcements. The market power hypothesis states that target firms should experience negative abnormal returns after a merger is terminated because the firms are then unable to achieve the potential gains from increased market power. The signalling hypothesis is built on an assumption that termination of a merger unveils previously unknown information about the target company to the public. The termination announcement should therefore cause either a negative or a neutral market response. According to the competitive advantage hypothesis, the competitive position of the target company becomes weaker due to the merger termination and the resulting target shareholder returns are thus negative. The cumulative abnormal return (CAR) of target companies is -4,83 % for the day before and after the termination announcement, compared to a slightly positive CAR of 0,94 % on the preceding ten-day period. The price effect of the merger termination seems to diminish with time, as targets' CAR is -1,26 % over the event window of -2 to +11 trading days. Akhigbe et al. conclude that the negative abnormal returns for targets are explained by the presence of new information as suggested by the signalling hypothesis.

Sullivan, Jensen, and Hudson (1994) argue that the method of payment may affect the target share price development in terminated mergers. Their study examines the valuation effects for 84 US target companies over four event windows with market model methodology. The termination period starts one day before the termination announcement and ends 10 days after the announcement, and the overall period covers all trading days after the initial merger announcement plus the termination period. First, the authors find a significant CAR of -6,2 % during the termination period for all bids, while a positive and significant excess return of 5,7 % is found for the overall period. Further examination shows that target shareholders earn constantly higher returns when the proposed method of payment is cash. CAR is -7 % for cash offers and -8 % for stock offers over the termination period, and during the overall analysis period the difference is even higher, with cash offers yielding CAR of 9,7 % while CAR is -8,6 % for

stock offers. The presence of subsequent bids does not change the results. Sullivan et al. conclude that the revaluation of target's shares is permanent as the differences in returns are statistically significant for more than 90 days after the termination announcement. Cash offers earn higher returns because using cash as a method of payment reveals private and valuable information about the target's stand-alone value or synergy potential to the market.

Continuing on the work of Sullivan et al., Malmendier, Opp and Saidi (2016) as well as Bradley, Desai and Kim (1983) further investigate the target revaluation hypothesis. Bradley et al. find evidence that the market begins to expect an announcement of a subsequent, successful takeover offer shortly after the termination of the earlier bid has been published. The permanent revaluation of target shares thus does not derive from new information that the market receives, but rather from the anticipation of a future acquisition. The findings are inconclusive concerning whether the anticipation of the new bid diminishes in the long run, as the study by Bradley et al. analyses target shareholder returns for only 24 months after the termination announcement.

Malmendier et al. address 263 unsuccessful M&A deals between 1980 and 2008 and provide support for the findings of Sullivan et al. (1994) about higher post-announcement returns for cash-financed offers. Target companies' valuation becomes approximately 15 % higher after the termination announcement compared to their market valuation before the takeover attempt, when the proposed method of payment is cash. For stock-financed bids, the market valuation of the targets reverts to pre-offer levels. Malmendier et al. note that these differences in firms' valuation are permanent, and cannot be explained by possible subsequent bids or firm-specific factors.

## 4.4 Summary of previous research

Based on the existing literature, it can be concluded that target shareholders earn significant positive abnormal returns before and after the initial merger announcement. Knapp (1990) finds that most of the excess returns are generated already before the

announcement, as insider information about the mergers is often leaked to third parties who then trade on this information. On the other hand, previous research by Davidson et al. (1989), Dodd (1980), Akhigbe et al. (2000), and other authors suggests that target returns are negative for a few days after the termination of the merger is announced, but target share prices do return to pre-offer levels in the long term.

The results of the previous studies also indicate that terminated M&A deals reflect the overreaction theory of De Bondt and Thaler (1985), and the negativity anomaly by Rozin and Royzman (2001). According to the research presented in this chapter, the market reaction to the termination announcement is negative in the short run but target returns then increase in the long run, which is a sign of the investor overreaction that Rosen (2006) found for initial merger announcements. Similarly, the market response for a negative event (merger termination) is found to be larger than the response for a positive event (merger announcement), thus providing evidence of the negativity anomaly.

# 5 Data and methodology

Within this chapter, the data and methodology used in this thesis will be defined. First, chapter 5.1 introduces the sources of data and databases, and concludes with the descriptive statistics and characteristics of each transaction. To measure the market reaction to M&A termination announcements, this study employs event study methodology which will be described in detail together with the possible limitations of this study in the final part of this chapter.

## 5.1 Data description

The data used in this study consists of daily stock price data for the acquisition targets and the benchmark index, and press releases by the acquirer or the target company on the termination of the deal. The merger sample is retrieved from the Thomson Reuters Securities Data Company's (SDC) Mergers and Acquisitions Database, while the historical price data for the target companies and the FTSE 100 index is collected from Thomson Reuters Datastream. This thesis examines cancelled deals and the market reaction in the UK, as the region's capital markets are stable and large enough to provide a sufficient sample of terminated transactions and easy access to historical corporate financial data.

The initial sample for cancelled M&A deals involving UK-based targets contains a total of 362 cancelled transactions between the years 2001 and 2020. However, 320 transactions are not included in the final sample due to either imprecise announcement dates or unavailable historical share price data. Furthermore, target companies with subsequent transactions or multiple concurrent bids are excluded. The final sample consists of 42 cancelled deals that fulfil the following criteria:

1. The target firm is from the UK.
2. The target has been involved in a M&A deal which was ultimately terminated between the period 1.1.2004 to 1.4.2020.
3. The target was listed in the London Stock Exchange before the initial M&A announcement, as well as after the termination announcement.

4. Share price data is available in Thomson Reuters Datastream for the estimation and event periods.
5. The cancellation date is clearly communicated through an announcement by both or one of the companies involved.
6. At least 25 days between the initial merger announcement and the termination announcement.
7. No other bids simultaneously or within 40 days after the withdrawal of the bid.

The following tables and figures will introduce the sample in more detail. Figure 2 describes the distribution of terminated deals over the sample period. As expected, the largest amount of abandoned deals for a single year is recorded at the start of the financial crisis in 2008. The number of terminated transactions declines substantially during 2009 and 2010, which is consistent with the findings of Ernst & Young's previously presented M&A activity report. For the most recent period after the financial crisis, the distribution is relatively flat as there is no significant fluctuation between different years, apart from 2017. The eight-year periods of 2004-2011 and 2012-2019 cover 20 and 21 cancelled deals, which ensures that the research question of whether the market reaction to terminated deals has changed over the 21st century, can be studied precisely.

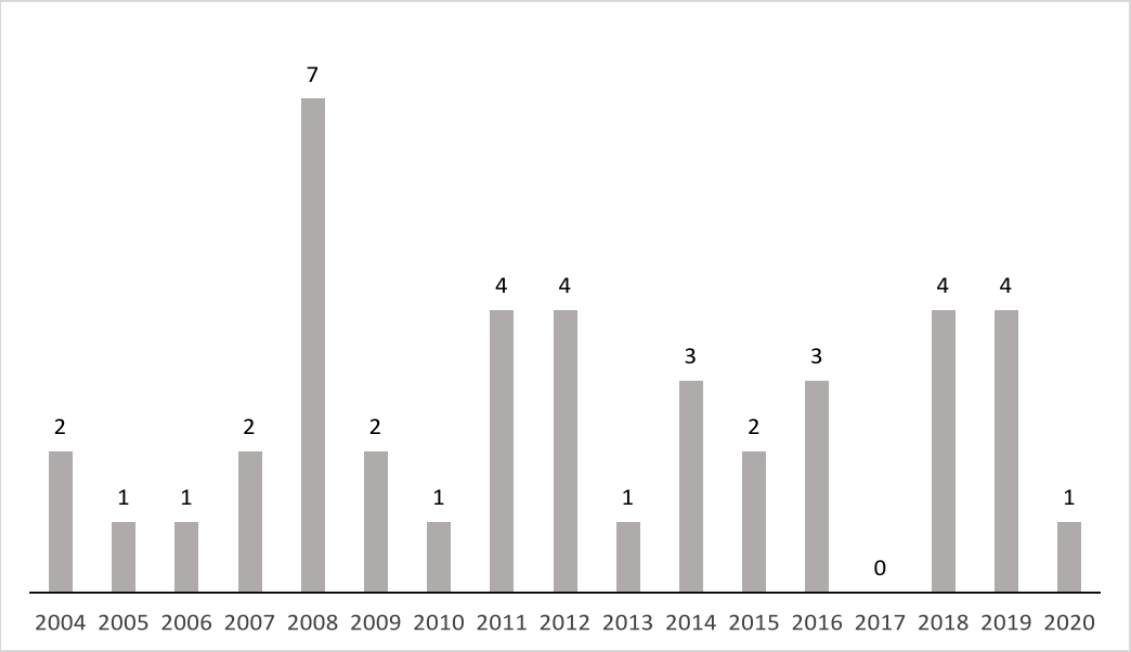


**Figure 2.** Distribution of terminated deals over the sample period.

The key financial information of the acquisition targets is collected from Thomson Reuters Datastream and shown in Table 1 below. The table presents the mean value, median value, minimum and maximum values, and standard deviation of each financial variable for the sample firms on 21.07.2020. Financial data is unavailable for three companies due to their bankruptcy or a subsequent successful merger with another firm. The share price of each target company is reported in euros while the other figures are stated in billions of euros. As shown in the table, the mean revenue of the sample companies is approximately 1,5 billion euros while the median is 60 million. The sample firms have 5,3 billion euros worth of assets and 4,5 billion euros of liabilities on average, while London Stock Exchange Group possesses the most assets and total liabilities. Furthermore, the extensive share price range highlights the differences in firms' sizes and earnings prospects.

| *in bn €* | Mean | Median | Min | Max | SD | N |
|---|---|---|---|---|---|---|
| Revenue | 1,55 | 0,06 | 0,01 | 30,11 | 5,84 | 39 |
| Assets | 5,38 | 0,09 | 0,02 | 88,42 | 18,36 | 39 |
| Liabilities | 4,51 | 0,05 | 0,01 | 86,67 | 16,50 | 39 |
| Share price | 8,52 € | 2,01 € | 0,03 € | 100,60 € | 21,17 | 39 |

**Table 1.** Descriptive statistics.

Table 2 illustrates the characteristics of the cancelled transactions by introducing the industry of each target company, the average period between the initial bid and the termination announcement, and whether is was the acquirer, the target company, or the government that ultimately cancelled the transaction. The industrial and financial sectors comprise a major share of the sample firms together with the consumer goods and services industry. The acquiring company withdraws its bid unilaterally in 25 of the 42 studied transactions. Interestingly, only one transaction in the sample is intercepted by the government. The average interval between the initial M&A announcement and the termination announcement is 85 days, while the 314-day interval of the attempted merger between Augean and One Fifty One PLC is the longest within the sample. Appendix 1 provides additional information about the final sample.

| Target company | Industry group | Terminating party | Days between the initial M&A announcement and termination |
|---|---|---|---|
| Angle PLC | Healthcare | Acquirer | 156 |
| Anglo American PLC | Basic materials | Acquirer | 115 |
| AstraZeneca PLC | Healthcare | Acquirer | 29 |
| Augean PLC | Industrials | Acquirer | 314 |
| BAE Systems PLC | Industrials | Government | 28 |
| Balfour Beatty PLC | Industrials | Mutual decision | 27 |
| Bodycote PLC | Industrials | Acquirer | 56 |
| Britvic PLC | Consumer goods | Target | 309 |
| Carclo PLC | Industrials | Acquirer | 36 |
| Chemring Group PLC | Industrials | Acquirer | 82 |
| Clipper Logistics PLC | Industrials | Mutual decision | 56 |
| De La Rue PLC | Industrials | Target | 49 |
| Eckoh PLC | Industrials | Mutual decision | 62 |
| Filtronic PLC | Technology | Acquirer | 160 |
| FirstGroup PLC | Industrials | Mutual decision | 27 |
| Flybe Group PLC | Industrials | Acquirer | 28 |
| Grainger PLC | Financials | Acquirer | 38 |
| Gresham House PLC | Financials | Acquirer | 142 |
| Intu Properties PLC | Financials | Acquirer | 56 |
| iomart Group PLC | Technology | Acquirer | 53 |
| K3 Business Technology Group PLC | Technology | Mutual decision | 56 |
| Laura Ashley Holdings PLC | Consumer goods | Acquirer | 25 |
| London Stock Exchange Group PLC | Financials | Acquirer | 27 |
| Lookers PLC | Consumer goods | Mutual decision | 57 |
| Marks & Spencer Group PLC | Consumer goods | Acquirer | 48 |
| Michael Page International | Industrials | Acquirer | 42 |
| Mitchells & Butlers PLC | Consumer services | Acquirer | 31 |
| Moss Bros Group PLC | Consumer goods | Acquirer | 169 |
| MP Evans Group PLC | Energy | Target | 58 |
| Premier Foods PLC | Consumer goods | Acquirer | 61 |
| Provident Financial PLC | Financials | Acquirer | 102 |
| RDI REIT PLC | Financials | Mutual decision | 27 |
| Redrow PLC | Industrials | Acquirer | 48 |
| RSA Insurance Group PLC | Financials | Acquirer | 55 |
| Securities Trust of Scotland PLC | Financials | Acquirer | 67 |
| Sportech PLC | Consumer services | Mutual decision | 84 |
| Sportingbet PLC | Consumer services | Mutual decision | 109 |
| TLA Worldwide PLC | Consumer services | Mutual decision | 173 |
| Universe Group PLC | Technology | Mutual decision | 246 |
| WH Smith PLC | Consumer goods | Acquirer | 96 |
| Wilmington PLC | Consumer goods | Mutual decision | 56 |
| Xaar PLC | Technology | Target | 93 |
| Mean | Industrials | Acquirer | 85 |

*The companies are classified into industries in accordance with the Thomson Reuters Business Classification standards. The information on the terminating party and announcement dates is obtained from official press releases by the acquirer and/or the target company.*

**Table 2.** Characteristics of each terminated transaction.

## 5.2 Methodology

Similarly to many previous studies, this thesis employs the traditional event study methodology of Fama, Fisher, Jensen, and Roll (1969) to examine the stock price reaction following M&A announcements. MacKinlay (1997) notes that the impact of an unanticipated event on the company's shareholder returns can be analysed most effectively with an event study. He further argues that by conducting an event study, researchers can measure the impact of the event with analysing data from a relatively short period, while competing methodologies often require a more extensive sample of data. The price impact of the specific event is studied by first defining the normal returns of the company's stock with a statistical model, and then identifying the abnormal returns by subtracting the normal return from the actual return. The normal return of the stock is the return that would be expected if the event did not occur (Campbell, Lo, & MacKinlay, 1997, p. 151). Furthermore, to answer the research hypotheses, the cumulative average abnormal returns (CAARs) of the sample are calculated and tested for statistical significance to examine the price effects over various event windows as well as the eight-year periods of 2004-2011 and 2012-2019.

As mentioned previously, one of the purposes of this thesis is to measure the current market efficiency of the London Stock Exchange. While the primary intention of an earlier study by Franks, Broyles, and Hecht (1977) was to examine abnormal returns for acquisition targets in the UK with event study methodology, the authors were also able to show evidence on how effectively securities are priced in the market, i.e. what is the market response to corporate announcements. The findings of a paper by Brown and Warner (1980) confirm that the event study methodology provides useful information on the efficiency of the capital markets. Brown and Warner argue there is a conflict between the Efficient Market Hypothesis and any abnormal returns that may persist after a corporate event. Because the EMH assumes that the company's stock price should always reflect all available information and that new information is incorporated into the prices quickly, the presence of systematic positive or negative abnormal returns

around corporate announcements or similar events shows that the markets are not completely efficient.

### 5.2.1 Estimation period and event windows

Defining an appropriate length for both the estimation period and event windows is essential in order to conduct a successful event study. The parameters of the normal return model are estimated with historical price data from the estimation period, while the abnormal performance of the stock is examined over the various event windows (Campbell et al., 1997, pp. 151-152). As one of the criteria for the final sample is that the announcement date is clear, the event date (t0) is thus defined as the termination announcement date of each transaction. The estimation period of this study is 120 trading days, beginning 150 days before the event and ending 30 days before the event. MacKinlay (1997) suggests that the estimation period and the event windows should not overlap, as abnormal returns occurring over the event windows could affect the estimation and reliability of the parameters that are used in the calculation of normal returns.

Therefore, the first event window of this study begins 10 trading days after the estimation period. The event windows of -1 to +1 and -5 to +5 trading days are employed to measure the short-term price effect of the termination announcement, while the share price reaction over a longer period is examined with the event windows of -10 to +10 and -20 to +20 trading days. All four event windows begin at least one trading day before the event date, following the methodology of MacKinlay who suggests that such approach minimizes the effects of insider information leakages on the results. Moreover, to study whether the price effect of termination announcements begins to decrease shortly after the announcement, returns are examined over event windows of +1 to +5, +6 to +10, +11 to +15, +16 to +20, +1 to +10, and +11 to +20 trading days. Previous studies, such as McWilliams and Siegel (1997) and Andrade et al. (2001) have found that event studies with short event windows are able to investigate the shareholder wealth effects of M&A announcements more effectively than event studies with longer event windows.

The length of the event windows does not thus exceed 40 trading days. The event date, estimation period, and event windows are illustrated in Figure 3 below.

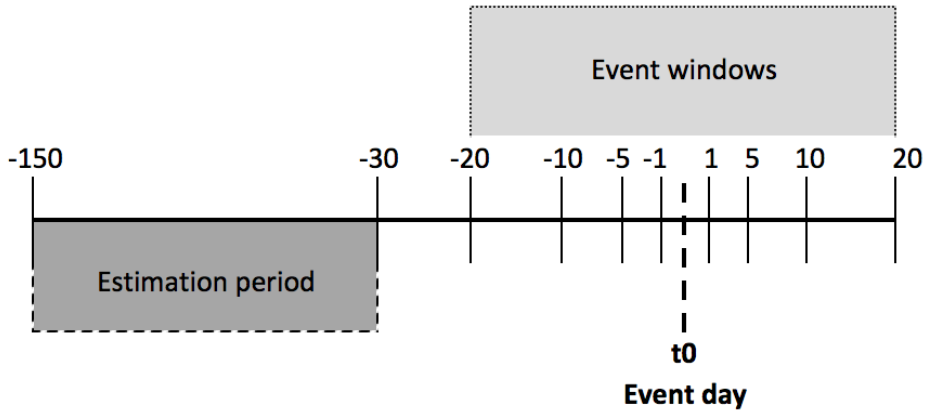


**Figure 3.** The estimation period, event date and event windows of the study.

### 5.2.2 Expected returns

The expected (normal) return of a stock can be defined with statistical and economic models. Economic models, such as the previously presented Capital Asset Pricing Model and the Arbitrage Pricing Theory compute expected returns by using assumptions about the market fundamentals and the stock's risk-return relationship (MacKinlay, 1997). MacKinlay notes that researchers prefer statistical models over economic models because the strict restrictions of economic models may affect the estimation of expected returns. According to Brown and Warner (1980), the market model and the constant-mean-return model are the most common statistical models. Their paper reviews the accuracy of statistical and economic models in defining companies' expected returns and shows that the market model provides more coherent and precise results than the constant-mean-return model, consistent with the findings of Dyckman, Philbrick, and Stephan (1984). Due to the versatility of the market model methodology and the findings of previous studies, this thesis also employs the market model to measure the normal returns for each acquisition target company.

The equation for the market model is written as follows:

$$E(R_{it}) = \alpha_i + \beta_i R_{mt} + \epsilon_{it} \ , \tag{4}$$

where the company i's expected return at time t, $E(R_{it})$, consists of economic parameters $\alpha_i$ and $\beta_i$, the zero-mean error term $\epsilon_{it}$, and $R_{mt}$ which is the return of the benchmark market index at time t (MacKinlay, 1997). As mentioned previously, parameters $\alpha_i$ and $\beta_i$ are derived with Ordinary Least Squares from the estimation period's price data. $\beta_i$ describes the stock's systematic risk, while $\alpha_i$ is a constant component in the company's share price.

### 5.2.3 Abnormal returns

The target companies' expected returns are then used to calculate abnormal returns. The abnormal return of the company i at time t, $AR_{it}$, is computed by subtracting the stock's expected return $E(R_{it})$ from $R_{it}$ which is the stock's actual return (MacKinlay, 1997). Equation 5 presents the formula for calculating the stock's daily abnormal return.

$$AR_{it} = R_{it} - E(R_{it}) \tag{5}$$

The next step in performing an event study is to estimate the average abnormal return for all the studied companies. The average abnormal return of the sample at time t, $AAR_t$, is computed with the formula below in which N denotes the number of individual stocks, and $AR_{it}$ is the stock's previously calculated abnormal return (MacKinlay, 1997).

$$AAR_t = \frac{1}{N} \sum_{i=1}^{N} AR_{it} \tag{6}$$

Because the formula of Equation 6 measures the sample's average abnormal return only at a certain point of time, the average abnormal returns are finally aggregated over the event windows to examine the total price impact of M&A announcements. Therefore, the cumulative average abnormal return (CAAR) of the sample over a specific event window is computed with the following formula.

$$CAAR(t_1, t_2) = \sum_{t=t1}^{t2} AAR_t \quad (7)$$

$CAAR(t_1, t_2)$ denotes the sample's cumulative average abnormal return for the period t1 – t2, and $AAR_t$ is the average abnormal return at time t (MacKinlay, 1997).

### 5.2.4 Tests for statistical significance

After the average abnormal returns and the cumulative average abnormal returns have been computed, the results are tested for statistical significance to conclude whether any abnormal returns that are significantly different from zero are found. Brown and Warner (1980) explain that the statistical significance of the results will eventually determine whether the research hypotheses are accepted or rejected. On the other hand, McWilliams and Siegel (1997) find that because the samples of event studies are often small, the results may be biased due to one or several outliers within the sample which further complicates the interpretation of the statistical significance. The problem can be resolved by reviewing the results for possible outliers, and estimating if the effect of the outliers on the results is large enough that the outliers should be excluded from the sample. The test statistic applied in this thesis is the t-statistic, developed by Boehmer, Musumeci, and Poulsen (1991). The t-statistic of Boehmer et al., also known as the standardized cross-sectional test, uses return data from both the estimation and event periods.

### 5.2.5 Limitations of the event study methodology

Because event studies generally employ daily price data instead of monthly data to compute the abnormal returns, Brown and Warner (1985) note that both the daily returns and excess returns exhibit a non-normal, fat-tailed distribution. As the parameters of the market model are estimated with OLS from daily return data, the estimates may be contradictory and biased. However, the authors suggest that while individual stocks may reflect non-normality of returns, using a larger sample size solves the issue. According to Brown and Warner, including a sufficient amount of stocks in the

sample results in a mean excess return that is close to normality. A precise estimation of the sample mean excess return and its variance is essential in event studies, as the estimates affect the efficiency of testing the abnormal returns for statistical significance.

A study by Kolari and Pynnönen (2010) notes that another common characteristic of event studies is the cross-sectional correlation of returns when the event occurs on the same date for multiple firms in the sample. Kolari and Pynnönen argue that the event-date clustering among the sample affects the tests for statistical significance, as the test statistics typically presume that the abnormal returns are independent of each other. They conclude that the consequence of cross-sectional correlation is rejecting the null hypothesis even when the abnormal returns are significantly different from zero. Similarly to the findings of Kolari and Pynnönen, Malatesta (1986) reports that the data used in event studies is prone to both calendar and industry clustering, as the companies within the sample often operate in only one or two industries. He suggests that a generalized least squares approach could be applied to prevent clustering issues. In this thesis, companies from several industries are included in the final sample and any terminated transactions with overlapping announcement dates are excluded to avoid cross-sectional correlation.

# 6 Empirical results

The empirical results of the study are presented and discussed in this chapter. Each part of the chapter covers one of the research hypotheses, with the overall effect of M&A termination announcements on target shareholder returns addressed first. Section 6.1.2 analyses the price effect over post-announcement event windows to show whether the effect begins to decrease shortly after the termination announcement. Finally, to address whether the magnitude of the negative post-announcement market reaction has changed during the 21st century, abnormal returns are examined over the eight-year periods of 2004-2011 and 2012-2019. Altogether, the findings provide up-to-date evidence of the London Stock Exchange's market efficiency and the price impact caused by unsuccessful M&A deals.

### 6.1.1 Do M&A termination announcements affect the target companies' stock prices?

The null hypothesis $H_0$ and the alternative hypothesis $H_1$ of this thesis focus on examining whether M&A termination announcements affect the stock prices of the acquisition targets. Table 3 presents the expected return and average abnormal return (AAR) of the sample for each event day. AAR is computed by using the expected and actual returns of each target company, with initial M&A announcement day returns being excluded from the market model estimates as the average target return over these dates is exceptionally high and thus may distort the market model estimates.

AAR is negative for 21 days of the 41 days studied, with the sample's expected return ranging from 0,19 % to -0,36 %. Average abnormal returns begin to turn increasingly negative at day -5 and remain mostly negative until day +6. The most negative AARs of -2,98 % and -1,26 % are found for event days 0 and +2. Unsurprisingly, AAR is -0,57 % at day -1, indicating at least partial leakage of insider information just before the termination announcement is published. However, after the highly negative AAR at the announcement day, the market reaction is significantly weaker at the following day +1 with AAR of -0,24 %.

| Day | Expected return for the sample | AAR | AAR t-stat |
|---|---|---|---|
| -20 | -0,08 % | 0,39 % | 1,05 |
| -19 | -0,21 % | -0,21 % | -0,97 |
| -18 | 0,17 % | 0,06 % | 0,24 |
| -17 | -0,02 % | 0,48 % | 1,42 |
| -16 | -0,09 % | -0,28 % | -1,39 |
| -15 | -0,36 % | 0,00 % | -0,02 |
| -14 | 0,19 % | 0,44 % | 1,17 |
| -13 | 0,08 % | -0,17 % | -1,12 |
| -12 | -0,01 % | 0,06 % | 0,30 |
| -11 | -0,11 % | 0,32 % | 1,01 |
| -10 | -0,17 % | 0,24 % | 0,77 |
| -9 | -0,05 % | -0,61 % | -1,57 |
| -8 | -0,10 % | -0,36 % | -1,05 |
| -7 | -0,13 % | 0,10 % | 0,63 |
| -6 | 0,15 % | 0,03 % | 0,16 |
| -5 | 0,08 % | -0,12 % | -0,78 |
| -4 | -0,12 % | -0,23 % | -1,29 |
| -3 | 0,08 % | 0,30 % | 0,99 |
| -2 | 0,09 % | -0,18 % | -1,09 |
| -1 | -0,01 % | -0,57 % | -1,76* |
| **0** | **-0,17 %** | **-2,98 %** | **-3,59*** ** |
| +1 | -0,11 % | -0,24 % | -0,96 |
| +2 | -0,02 % | -1,26 % | -2,31** |
| +3 | 0,12 % | 0,52 % | 1,42 |
| +4 | -0,03 % | -0,19 % | -1,12 |
| +5 | -0,05 % | -0,30 % | -1,55 |
| +6 | -0,05 % | -0,15 % | -0,59 |
| +7 | 0,06 % | 0,25 % | 1,08 |
| +8 | -0,09 % | 0,07 % | 0,41 |
| +9 | -0,06 % | -0,05 % | -0,68 |
| +10 | 0,11 % | 0,22 % | 1,16 |
| +11 | -0,23 % | 0,07 % | 0,17 |
| +12 | 0,06 % | -0,30 % | -0,95 |
| +13 | -0,05 % | 0,57 % | 1,71* |
| +14 | 0,01 % | -0,06 % | -0,39 |
| +15 | 0,03 % | -0,16 % | -0,78 |
| +16 | -0,18 % | 0,17 % | 0,79 |
| +17 | -0,13 % | 0,08 % | 0,40 |
| +18 | -0,22 % | -0,36 % | -1,11 |
| +19 | -0,03 % | 0,11 % | 0,56 |
| +20 | -0,17 % | -0,04 % | -0,08 |

*Statistical significance at 10%, 5% and 1% is denoted with *, ** and ***.*

**Table 3.** The expected return and average abnormal return of the sample for event days -20 to +20.

As shown in Table 3, the t-statistics of AARs remain insignificant until the event days surrounding the announcement. A total of four event days provide statistically significant positive or negative AARs. The negative AAR at day -1 is significant at the 10 % level, while AARs of day 0 and day +2 are significant at the 1 % and 5 % levels, respectively. Furthermore, the positive AAR of 0,57 % at event day 13 is significant at the 10 % level. The results of Table 3 provide evidence that $H_1$ could be accepted as statistically significant abnormal returns are found surrounding the M&A termination announcement date. However, the returns will be also examined for multiple event windows (see Table 4) before the null hypothesis and the alternative hypothesis are accepted or rejected. Figure 4 below further illustrates the distribution of the sample's average abnormal return and expected return over each event date, and shows that apart from days -1 to +3, the difference between the returns of these two metrics can be considered as minor.

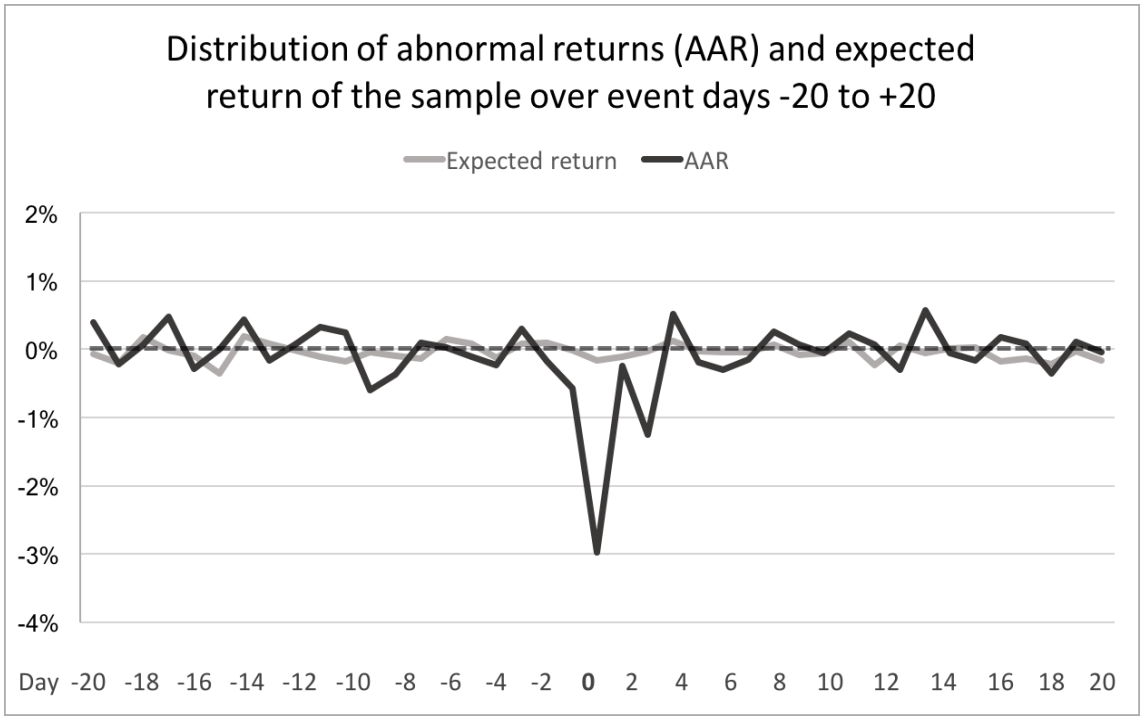


**Figure 4.** AAR versus expected return of the sample for event days -20 to +20.

To study the market reaction over a period longer than just a single day, Table 4 presents the cumulative average abnormal returns of the sample and their respective t-statistics for event windows of various length. As all of the four event windows include the days around the announcement date with highly negative AARs, CAARs are also negative for all event windows. The most negative CAAR of -5,50 % is found for event window -10 to +10, which is largely explained by the highly negative AARs at event days -8 and -9. CAAR is also more negative for event window -5 to +5 than for event window -1 to +1, as the former includes event day +2 with AAR of -1,26 %. The negative CAARs are statistically significant at the 5 % level for all event windows other than the period -20 to +20 days.

Figure 5 shows the development of the average abnormal return and cumulative average abnormal return of the sample over each event day and provides evidence that the London Stock Exchange can not be considered at least fully informationally efficient. According to the EMH, prices should change only and immediately when new information becomes available. However, it seems that the new information revealed on event day 0 is not incorporated into the target companies' stock prices efficiently after the announcement, as CAAR of the sample declines further after the event.

| Event window | CAAR | CAAR t-stat |
|---|---|---|
| -1, +1 | -3,79 % | -2,31** |
| -5, +5 | -5,25 % | -2,20** |
| -10, +10 | -5,50 % | -2,18** |
| -20, +20 | -4,35 % | -1,53 |

*Statistical significance at 10%, 5% and 1% is denoted with *, ** and ***.*

**Table 4.** The cumulative average abnormal return and t-statistics for event windows -1 to +1, -5 to +5, -10 to +10 and -20 to +20.

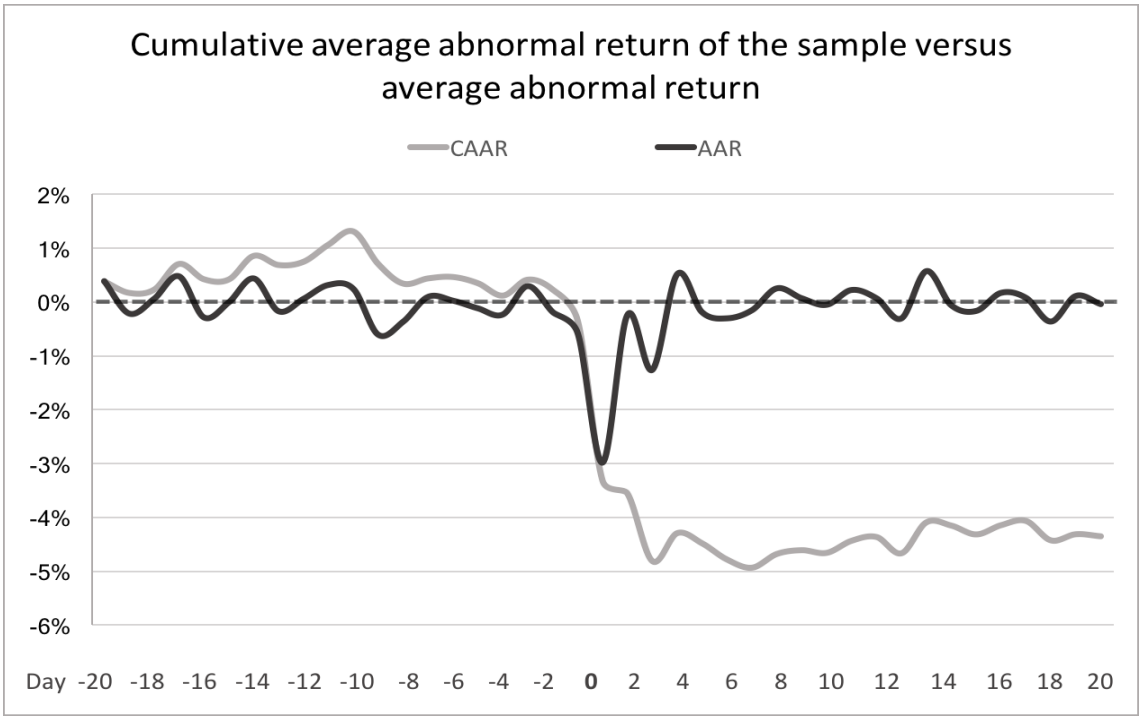


**Figure 5.** CAAR and AAR of the sample for all event days.

The findings presented in the figures and tables above indicate that the stock prices of acquisition targets are affected by cancelled M&A deals. The negative price effect of termination announcements, measured by daily AARs, is at its highest during event days -1, 0 and +2. Furthermore, statistically significant CAARs are found for three event windows around the announcement. The CAAR of the longest event window -20 to +20 event days is less negative than for two of the shorter event windows (-5 to +5 and -10 to +10 days) and not statistically significant, providing further evidence that the price effect is concentrated around the announcement date. Altogether, the results support accepting the alternative hypothesis $H_1$ while the null hypothesis $H_0$ is rejected.

### 6.1.2 Does the price effect of M&A termination announcements begin to decrease shortly after the event?

This chapter examines how the returns of acquisition targets change shortly after the termination announcement. Cumulative average abnormal returns and their respective t-statistics for a total of four five-day post-announcement event windows and two ten-

day event windows are presented in Table 5 below. Based on the results obtained, the second hypothesis $H_2$ claiming that the price effect of termination announcements begins to decrease within a few days after the event, will be either accepted or rejected.

| Event window | CAAR | CAAR t-stat |
|---|---|---|
| +1, +5 | -1,47 % | -0,98 |
| +6, +10 | 0,35 % | 0,26 |
| +11, +15 | 0,12 % | 0,09 |
| +16, +20 | -0,03 % | -0,06 |
| +1, +10 | -1,12 % | -0,81 |
| +11, +20 | 0,08 % | 0,14 |

*Statistical significance at 10%, 5% and 1% is denoted with *, ** and ***.*

**Table 5.** CAAR and t-statistics for post-announcement event windows.

Following the results obtained in the previous chapter, the most negative CAAR of the five-day event windows is found for the period +1 to +5 that covers event days just after the announcement. The market reaction begins to diminish during event windows +6 to +10 and +11 to +15 trading days, as both periods yield positive CAARs. However, none of the five-day CAARs are statistically significant, and thus no definitive conclusions about the change in the magnitude of the market reaction can be drawn yet. The CAARs of the ten-day event windows follow a similar pattern as the five-day CAARs. A negative but insignificant cumulative average abnormal return of -1,12 % is found for event window +1 to +10 days, while event window +11 to +20 yields a positive but insignificant CAAR of 0,08 %. Figure 6 compares the development of the five-day post-announcement CAARs.

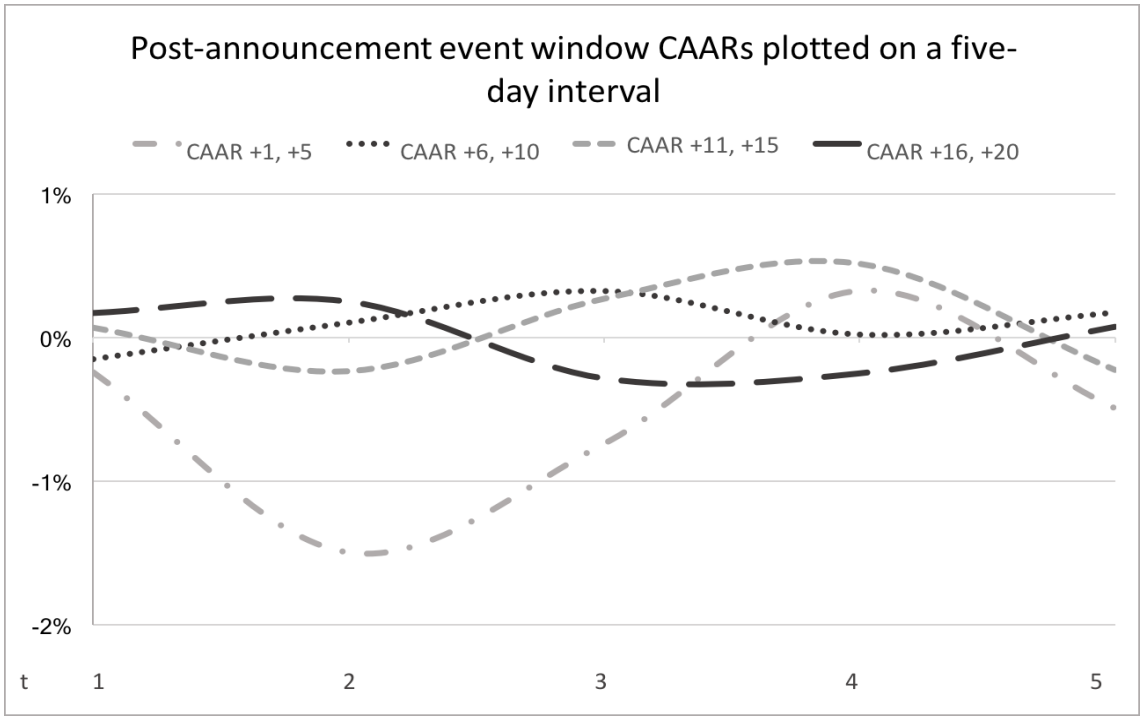


**Figure 6.** Five-day CAAR for post-announcement event windows.

The post-announcement event window results are consistent with previous research of Akhigbe, Borde and Whyte (2000) who found that the negative price effect of termination announcements becomes insignificant soon after the event date. On the other hand, the negative CAAR for event window +1 to +5 and the positive CAARs for the subsequent periods support the investor overreaction theory of De Bondt and Thaler (1985). The +1 to +5 day CAAR also once again suggests that the informational efficiency of the London Stock Exchange should be questioned, because CAAR continues to decline further on event day +2 after already being highly negative on day +1. Moreover, the ten-day CAAR is positive for the event window of +11 to +20 days after a negative CAAR for event window +1 to +10, thus providing additional support for the investor overreaction theory. However, as none of the above-mentioned CAARs are statistically significant, the second hypothesis $H_2$ cannot be accepted.

### 6.1.3 Has the market reaction to M&A termination announcements diminished over the recent years?

The third hypothesis of this thesis was set to investigate whether the investor response to M&A termination announcements has changed over the 21st century, as existing literature has not addressed this question. The hypothesis follows the research of Andrade, Mitchell and Stafford (2001) who found that the abnormal returns of acquisition targets around merger announcements were higher during the 1970s and 1980s than during the 1990s. To examine the possible changes in the market reaction over the recent years, two groups of terminated deals are formed, with both samples covering an eight-year period. The first group includes 20 terminated transactions over the years 2004 to 2011, while the second group consists of 21 cancelled deals during the period 2012-2019. In order to ensure that the samples are comparative, the singular terminated transaction that occurred in 2020 is not included in this research. Tables 6 and 7 below show the CAARs and t-statistics of the two subsamples over each event window, while Figure 7 provides a graphical presentation of the samples' CAARs for event days -20 to +20.

| Event window | CAAR 2004-2011 | CAAR t-stat |
|---|---|---|
| -1, +1 | -4,50 % | -2,09** |
| -5, +5 | -5,44 % | -2,22** |
| -10, +10 | -5,81 % | -1,90* |
| -20, +20 | -4,58 % | -1,56 |

*Statistical significance at 10%, 5% and 1% is denoted with *, ** and ***.*

**Table 6.** CAAR and t-statistics for the sample of terminated transactions during the years 2004-2011.

| Event window | CAAR 2012-2019 | CAAR t-stat |
|---|---|---|
| -1, +1 | -3,06 % | -1,88* |
| -5, +5 | -5,01 % | -2,25** |
| -10, +10 | -5,30 % | -1,93* |
| -20, +20 | -4,14 % | -1,47 |

*Statistical significance at 10%, 5% and 1% is denoted with *, ** and ***.*

**Table 7.** CAAR and t-statistics for the sample of terminated transactions during the years 2012-2019.

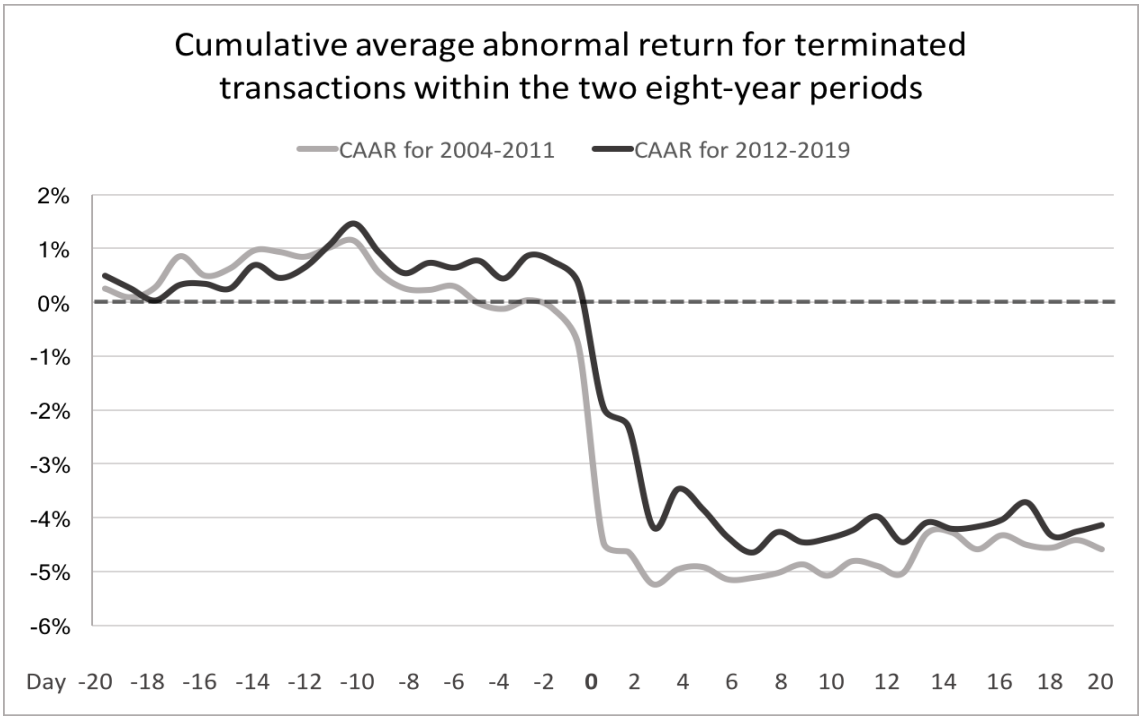


**Figure 7.** CAAR for terminated transactions within periods 2004-2011 and 2012-2019.

The findings suggest that the share prices of acquisition targets have constantly changed more during the first eight-year period than during the second period. CAARs of the 2004-2011 sample are more negative over each event window compared to the respective 2012-2019 CAARs and as Figure 7 illustrates, the first sample outperforms its counterpart in terms of CAAR only between event days -18 to -11. CAARs of the first sample are statistically significant at the 5% level for event windows -1 to +1 and -5 to +5, and at the 10 % level for event window -10 to +10. For the 2012-2019 sample, CAAR of -5 to +5 days is significant at the 5% level while event day -1 to +1 and -10 to +10 CAARs are significant at the 10% level. As the -20 to +20 event window is the only period in this analysis that does not generate statistically significant results, it can be concluded that the negative market reaction to terminated M&A deals seems to have diminished during the 21st century, at least for the nearest 20 days around the announcement date.

| Sample | Target | CAR -1, +1 | CAR -5, +5 | CAR -10, +10 | CAR -20, +20 |
|---|---|---|---|---|---|
| 2004-2011 | Anglo American PLC | 2,67 % | 4,29 % | 13,88 % | 9,08 % |
| 2004-2011 | Universe Group PLC | 4,87 % | 4,07 % | 12,40 % | 1,79 % |
| 2004-2011 | Angle PLC | -29,50 % | -16,01 % | -13,81 % | -17,80 % |
| 2004-2011 | Lookers PLC | -19,39 % | -25,47 % | -27,22 % | -23,91 % |
| 2012-2019 | K3 Business Technology Group | 6,58 % | 4,78 % | 18,63 % | 9,29 % |
| 2012-2019 | FirstGroup PLC | 7,00 % | 6,16 % | 15,10 % | 10,38 % |
| 2012-2019 | Premier Foods PLC | -15,24 % | -31,64 % | -26,31 % | 47,88 % |
| 2012-2019 | Intu Properties PLC | -13,49 % | -15,86 % | -12,99 % | -21,74 % |

**Table 8.** Transactions with positive and negative cumulative abnormal returns.

Table 8 presents both samples' terminated transactions that yield highly positive or negative cumulative abnormal returns (CARs), in order to explain the difference between the CAARs of the two subsamples. The selected transactions of the 2012-2019 sample generate a larger positive market reaction than the corresponding transactions during years 2004-2011, while the negative market reaction is stronger for transactions within the 2004-2011 sample. The findings clarify why the CAARs of the 2004-2011 sample are systematically more negative than for the 2012-2019 sample, even if the differences between the sample CAARs may be considered as minor.

Overall, the statistically significant results suggest that the negative market response to M&A termination announcements has been smaller during the recent years and thus $H_3$ is accepted. Investors have, on average, reacted more positively to such announcements over the period 2012-2019 and more negatively during the years 2004-2011. This is demonstrated by the less negative CAARs of the 2012-2019 sample over each event window when compared to the respective CAARs generated by unsuccessful transactions during the period 2004-2011.

### 6.1.4 Implications for market efficiency and practice

As mentioned previously, capital markets' capability to allocate resources efficiently across all investment targets is largely dependent on the quality and degree of information available to the public (Bodie, Kane, & Marcus, 2014). This assumption of information availability is pivotal to Fama's (1970) Efficient Market Hypothesis, which assumes that companies' stock prices always reflect all available information and prices change only when new and unexpected information is released. If all assumptions of the EMH are met, the markets can be considered as informationally efficient. Furthermore, Bodie et al. argue that whenever the markets are efficient, constantly achieving risk-adjusted returns that outperform than the average return of the market should not be possible.

The results obtained indicate that the new information contained in termination announcements is not immediately fully incorporated into the acquisition targets' stock prices in the London Stock Exchange, as the daily CAAR of the sample is more negative on event day +2 than on day +1. Thus the LSE cannot be described as a fully informationally efficient market. The results also provide support for the findings of previous studies, such as Keown and Pinkerton (1981) about trading on insider information. AAR of the sample at event day -1 is already negative at -0,57 %, suggesting that information about the forthcoming announcement is leaked or utilized by some parties. Moreover, the negative CAAR of event window +1 to +5 days and the positive CAARs for subsequent periods of +6 to +10 and +11 to +15 days after the event can be considered as evidence of the investor overreaction hypothesis by De Bondt and Thaler (1985). The market reaction to the termination announcement is clearly negative shortly after the event but returns then begin to increase rapidly, with previous studies by Davidson, Dutia and Cheng (1989) and Dodd (1980) reporting similar results. However, it must be emphasized that none of the five- and ten-day CAARs presented in chapter 6.1.2 are statistically significant.

# 7 Conclusion

The global mergers and acquisitions market has experienced significant growth in terms of total transaction value and number of deals since the financial crisis of 2008. Acquirers generally see M&A as a way to achieve cost savings, gain advantages of diversification by expanding into new markets as well as product categories and increasing their current market share by acquiring competitors. However, due to firm-specific or external factors such as the competition legislation, incorrect valuation of the target, and unsuccessful due diligence, some proposed transactions are not completed. Previous studies examining the share price development of acquisition targets have found that target shareholder returns are positive around initial M&A announcements and after completed acquisitions. But what would be the market reaction following a withdrawn M&A deal? Does the reaction indicate that the markets are efficient? To investigate these matters, this study analyses whether abnormal acquisition target shareholder returns occur following M&A termination announcements and whether the abnormal returns, if found, are concentrated solely on the few days around the event.

Previous research of Knapp (1990) has shown that abnormal returns occur already before the event date, because insider information about the forthcoming announcement is often leaked to third parties that utilise it to earn excess returns. On the other hand, Davidson, Dutia, and Cheng (1989) as well as Akhigbe, Borde, and Whyte (2000) find that acquisition targets' share prices begin to increase shortly after the termination announcement is published and return to their previous levels in the long run. Their findings about the market reaction to unsuccessful M&A deals also provides support for the overreaction theory of De Bondt and Thaler (1985), which states that the very negative investor response in the short term is caused by behavioural factors, that is, overreacting when negative information becomes public. Moreover, previously conducted research shows that the magnitude of investor reaction seems to be dependent on whether the event is considered as positive or negative by the market. The merger termination announcement leads to a larger change in the target company's

share price than the initial merger announcement, supporting the negativity anomaly of Rozin and Royzman (2001).

The null hypothesis and the alternative, first hypothesis of this thesis are related to the findings of Akhigbe et al. about M&A announcements having a significant impact on acquisition targets' share prices. Therefore, the null hypothesis claims that M&A termination announcements do not affect the stock prices of acquisition targets, while the alternative hypothesis states that M&A termination announcements do affect the stock prices of acquisition targets. The second hypothesis follows the previous research of Dodd (1980) and Davidson et al., and argues that the price effect of M&A termination announcements begins to decrease within a few days after the event. As previous studies have not examined whether the investor response to cancelled transactions has changed over the 21st century, the third hypothesis of this thesis states that the negative market reaction to M&A termination announcements has diminished over the recent years.

The hypotheses are examined by using market model methodology to compute the average and cumulative average abnormal returns for the final sample, which includes 42 withdrawn M&A deals between the years 2004 and 2020. The abnormal returns and their significance are studied over various event windows to investigate at what point the highest price effect is generated. Furthermore, the sample is divided into two smaller groups to analyse whether the market reaction to terminated M&A deals has changed during recent years.

When the findings for the entire sample are examined, it becomes evident that acquisition targets' returns are indeed negatively affected by the termination of planned M&A deals. The average abnormal return of the sample is mostly negative over the period -5 to +6 event days. Event days -1 and 0 generate statistically significant AARs of -0,57 % and -2,98 %, while day +2 yields another highly significant AAR of -1,26 %. Interestingly, the market reaction is significantly smaller on the day following the termination announcement, as AAR of -0,24 % is found for event day +1. The negative

and significant AAR at day -1 suggests that some insider information about the termination announcement is leaked to third parties before being published. The cumulative average abnormal returns of the sample are negative for all the four event windows studied. The negative CAARs are statistically significant for event windows -1 to +1, -5 to +5 and -10 to +10 event days. Moreover, event windows -5 to +5 and -10 to +10 yield more negative CAARs than the longest event window of -20 to +20 days, indicating that most of the negative market reaction occurs within a few days around the announcement date.

The results for post-announcement event windows suggest that the negative price effect of termination announcements begins to decrease shortly after the event date, as event windows of +6 to +10 and +11 to +15 days generate positive CAARs. CAAR of the period +1 to +5, covering event days just after the announcement, is negative at -1,47 %. The ten-day post-announcement event windows yield similar results, as CAAR of the period +1 to +10 is again negative at -1,12 % compared to CAAR of 0,08% for period +11 to +20 trading days. However, none of the above-mentioned post-announcement CAARs are statistically significant, meaning that it cannot be concluded whether the market reaction actually becomes less notable after the event window of +1 to +5 days. The post-announcement findings support the investor overreaction theory of De Bondt and Thaler and also indicate that the London Stock Exchange may not be fully informationally efficient, as sample CAAR is more negative on event day +2 than on day +1.

Negative and statistically significant CAARs are found for most of the event windows when the abnormal returns of the two eight-year samples are studied. The results suggest that the market response to M&A termination announcements has been constantly more negative during the years 2004-2011 than during the period 2012 to 2019. The 2004-2011 sample yields more negative CAARs over each event window than the respective 2012-2019 sample. With the -20 to +20 event window being the only period not generating statistically significant CAARs for neither of the subsamples, it can be thus noted that the negative market reaction to terminated M&A deals seems to have diminished during the recent years.

Based on the results obtained, it can be concluded that M&A termination announcements have a significant negative impact on the share prices of acquisition target companies. Therefore, the alternative hypothesis $H_1$ is accepted while $H_0$ is rejected. As no statistically significant CAARs are found for the five- and ten-day post-announcement event windows, the second hypothesis $H_2$ claiming that the price effect of termination announcements begins to decrease within a few days after the event cannot be accepted. On the other hand, the results for the two eight-year samples indicate that the negative market reaction to unsuccessful transactions has diminished during the 21st century, meaning that the third hypothesis $H_3$ is accepted. The highly negative AARs of event days 0 and +2 suggest that investors overreact to unexpected negative events, while CAAR being more negative on event day +2 than on day +1 indicates that the new information is not immediately reflected in the target companies share prices and thus the London Stock Exchange may be described only as partially informationally efficient.

Future research could focus on examining the investor reaction to merger termination announcements in other geographical areas than the UK and the US, such as the Asian high-volume M&A market. It must be noted that conducting similar research on smaller markets such as the Nordics could be difficult as the number of terminated transactions in these areas is limited. In addition, the second hypothesis of this study could be examined for different, preferably longer event windows to investigate whether significant post-announcement CAARs would be found. Another topic for future studies, related to the third hypothesis, is examining whether the market reaction to M&A termination announcements has varied also during other periods than just the 21st century. For example, by analysing the development of the market response over the last 50 years, interesting findings concerning the behaviour and mindset of the investors could be discovered.

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# Appendix

## Appendix 1. Description of the final sample

| Target | Acquirer(s) | Deal announcement date | Deal cancellation date | Deal type |
|---|---|---|---|---|
| Angle PLC | Braveheart Investment Group PLC | 9.4.2008 | 12.9.2008 | Acquisition |
| Anglo American PLC | Xstrata PLC | 22.6.2009 | 15.10.2009 | Merger |
| AstraZeneca PLC | Pfizer Inc | 28.4.2014 | 27.5.2014 | Acquisition |
| Augean PLC | One Fifty One PLC | 26.8.2008 | 6.7.2009 | Acquisition |
| BAE Systems PLC | EADS | 12.9.2012 | 10.10.2012 | Merger |
| Balfour Beatty PLC | Carillion PLC | 24.7.2014 | 20.8.2014 | Merger |
| Bodycote PLC | Sulzer AG | 2.3.2007 | 27.4.2007 | Acquisition |
| Britvic PLC | A.G. Barr PLC | 5.9.2012 | 11.7.2013 | Merger |
| Carclo PLC | Consort Medical PLC | 2.7.2018 | 7.8.2018 | Acquisition |
| Chemring Group PLC | Carlyle Group LLC | 17.8.2012 | 7.11.2012 | Acquisition |
| Clipper Logistics PLC | Sun European Partners LLP | 20.11.2019 | 15.1.2020 | Acquisition |
| De La Rue PLC | Oberthur Fiduciaire SA | 6.12.2010 | 24.1.2011 | Acquisition |
| Eckoh PLC | Telephonetics PLC | 31.1.2008 | 2.4.2008 | Acquisition |
| Filtronic PLC | Carlyle Group LLC | 30.5.2008 | 6.11.2008 | Acquisition |
| FirstGroup PLC | Apollo Management IX LP | 11.4.2018 | 8.5.2018 | Acquisition |
| Flybe Group PLC | Stobart Group Ltd | 22.2.2018 | 22.3.2018 | Acquisition |
| Grainger PLC | Regis Group PLC | 30.6.2008 | 7.8.2008 | Acquisition |
| Gresham House PLC | Parkwood Property Investments LLP | 1.9.2007 | 21.1.2008 | Acquisition |
| Intu Properties PLC | Peel Group & Brookfield Property Group | 4.10.2018 | 29.11.2018 | Acquisition |
| iomart Group PLC | Host Europe Group Ltd | 24.7.2014 | 15.9.2014 | Acquisition |
| K3 Business Technology Group PLC | P J Claesson | 1.12.2011 | 26.1.2012 | Acquisition |
| Laura Ashley Holdings PLC | Flacks Group LLC | 25.2.2019 | 22.3.2019 | Acquisition |
| London Stock Exchange Group PLC | Hong Kong Exchanges Ltd | 11.9.2019 | 8.10.2019 | Merger |
| Lookers PLC | Trefick Ltd | 3.5.2011 | 29.6.2011 | Acquisition |

| Target | Acquirer(s) | Deal announcement date | Deal cancellation date | Deal type |
|---|---|---|---|---|
| Marks & Spencer Group PLC | Revival Acquisitions Ltd | 27.5.2004 | 14.7.2004 | Acquisition |
| Michael Page International | Adecco SA | 5.8.2008 | 16.9.2008 | Acquisition |
| Mitchells & Butlers PLC | Piedmont Inc | 12.9.2011 | 13.10.2011 | Acquisition |
| Moss Bros Group PLC | Baugur Group hf | 10.12.2007 | 27.5.2008 | Acquisition |
| MP Evans Group PLC | KL-Kepong International Ltd | 25.10.2016 | 22.12.2016 | Acquisition |
| Premier Foods PLC | McCormick & Co Inc. | 12.2.2016 | 13.4.2016 | Acquisition |
| Provident Financial PLC | Non-Standard Finance PLC | 22.2.2019 | 4.6.2019 | Acquisition |
| RDI REIT PLC | Cromwell Property Group | 27.3.2019 | 23.4.2019 | Acquisition |
| Redrow PLC | Toscafund LLP & Penta Capital LLP | 31.8.2012 | 18.10.2012 | Acquisition |
| RSA Insurance Group PLC | Zurich Insurance Group AG | 28.7.2015 | 21.9.2015 | Acquisition |
| Securities Trust of Scotland PLC | Perpetual Investment Trust | 3.3.2005 | 9.5.2005 | Merger |
| Sportech PLC | Contagious Gaming Inc | 14.8.2015 | 6.11.2015 | Acquisition |
| Sportingbet PLC | Ladbrokes PLC | 23.6.2011 | 10.10.2011 | Acquisition |
| TLA Worldwide PLC | Atlantic Alliance Partnership | 24.3.2016 | 13.9.2016 | Acquisition |
| Universe Group PLC | Brulines Group PLC | 24.9.2009 | 28.5.2010 | Acquisition |
| WH Smith PLC | Permira LLP | 18.4.2004 | 23.7.2004 | Acquisition |
| Wilmington PLC | Metal Bulletin PLC | 26.6.2006 | 21.8.2006 | Merger |
| Xaar PLC | Danaher Co | 13.11.2006 | 14.2.2007 | Acquisition |