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Share Repurchase Announcements: A Managerial Tool for Mergers & Acquisitions Purposes?

Master Thesis

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Abstract

This thesis investigates whether managers make use of the share price increasing effect of share repurchase announcements for M&A activities. Using a sample of 2,789 open market share repurchase announcements of 1,428 unique U.S. firms between 2010 and 2016, this thesis finds evidence for the short- and long-term abnormal returns following share repurchase announcements. Furthermore, it is shown that short-term abnormal returns do not differ per industry. This thesis does not find evidence that firms are more likely to announce an M&A deal within one year following a share repurchase announcement. Evidence is found that firms are less likely to pay an M&A deal with stock when they announce an M&A deal within one year following a share repurchase announcement. Moreover, this thesis does not provide empirical evidence that firms pay higher acquisition premiums for M&A deals when they announce an M&A deal within one year following a share repurchase announcement. Lastly, the relative repurchase size of share repurchase announcements does not impact the payment method or acquisition premium of M&A deals. These results imply that managers do not make use of the share price increasing effect of share repurchase announcements for M&A activities.

Keywords: Share repurchases, Event study, Cumulative abnormal returns, Mergers and acquisitions, Acquisition premium

JEL Classification: G14, G30, G34, G35

List of abbreviations

ASR	Accelerated share repurchase
AR	Abnormal return
BHAR	Buy-and-hold abnormal return
BMP test	Boehmer, Masumeci & Poulsen test
CAGR	Compound annual growth rate
CapEx	Capital expenditures
CAR	Cumulative abnormal return
CRSP	Centre for Research in Security Prices
CTP	Calendar-time period
EPS	Earnings per share
EW	Equally-weighted
IRATS	Ibbotson's Return Across Time and Securities
M&A	Mergers and acquisitions
NPV	Net present value
OLS	Ordinary least squares
R&D	Research and development
SDC	Securities Data Company
SEA	Securities Exchange Act
SEC	Securities and Exchange Commission
SIC	Standard industrial classification
S&P	Standard & Poor's
VIF	Variance inflation factor
VW	Value-weighted
WACC	Weighted average cost of capital

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1. Introduction

The rapid growth in popularity of share repurchases, or stock buybacks, started in the 1980s. In 1980, U.S. firms announced around $5 billion of stock buybacks and this increased to $54 billion in 1987 (Bagwell & Shoven, 1989). Share repurchases are financial transactions in which publicly listed firms buy back their own priorly issued equity securities from their shareholders with corporate cash. Firms can repurchase their stocks in the open market, through tender offers, accelerated stock buyback programmes or by negotiating on private deals, whereas approximately 90% of the aggregate stock buyback volume is conducted in the open market (Busch & Obernberger, 2017). The growth of stock buybacks can be partially attributed to the adopted Rule 10b-18 of the Securities and Exchange Commission (SEC) in 1982. This legislation gives companies in the U.S. a safe harbour against stock price manipulation charges. Grullon & Michaely (2004) show that in the 1990s, for the first time in history, industrial companies spent more corporate cash on stock buybacks than on dividends. Skinner (2008) documents that the aggregate share repurchase value of U.S. industrial firms grew from $10 billion in 1983 to $223 billion in 2004. The Standard & Poor's (S&P) Dow Jones Indices reported that $728.7 billion was spent on share repurchases in 2019, a down of 9.6% of the all-time high of $806.4 billion in 2018. Apple led in 2019 at an amount of $81.7 billion (PR Newswire, 2020).

The rise of the share repurchase phenomenon triggered researchers to devote research on the stock returns surrounding stock buyback events. Prior literature broadly documents that stock buyback announcements lead to positive abnormal returns (ARs) in the short- and long-run, implying that the stock market favours them (e.g., Vermaelen, 1981; Comment & Jarrell, 1991; Stephens & Weisbach, 1998; Peyer & Vermaelen, 2009; Manconi, Peyer & Vermaelen, 2019). Moreover, many academics studied the rationale behind stock buyback announcements and found several non-mutually exclusive motives. The signalling theory states that executives announce stock buybacks to signal share price undervaluation to the stock market (Ofer & Thakor, 1987; Comment & Jarrell, 1991). According to Brav, Graham, Harvey & Michaely (2005), the price support theory suggests that executives launch buybacks to raise the company's stock price whenever there has occurred a stock price decline. Next, the free cash flow hypothesis entails that stock buybacks mitigate the free cash flow problem (Jensen, 1986). Moreover, Guay & Harford (2000) conclude that stock buybacks can serve as a substitute for dividends and are the preferred pay-out method due to their flexible nature and tax advantages. Besides, managers use stock buybacks to attain an optimal capital structure (Bonaimé, Öztekin & Warr, 2014) or to deter hostile takeovers (Billett & Xue, 2007). Additionally, executives tend to repurchase shares for their own benefits when they hold substantial equity stakes in the firm or to increase earnings per share (EPS) (Jolls, 1998; Babenko, 2009). Lastly, the acquisition currency theory suggests that firms use share repurchases to finance future mergers and acquisitions (M&A) (Gerke, Fleischer & Langer, 2002).

M&A deals are, besides buybacks, significant strategic transactions. Firms have various incentives to engage in M&A activities. According to Mukherjee, Kiymaz & Baker (2004), creating synergies is the primary motive for acquisitions. Moreover, managers are encouraged to bid for target firms for their own benefits (Denis, Denis & Sarin, 1997). The payment method is a major decision during an M&A process and several factors influence this decision. Earlier research shows that undervalued firms prefer paying with cash, whereas overvalued firms prefer paying with stock (e.g., Martin, 1996; Baker & Wurgler, 2002; Rhodes-Kropf, Robinson & Viswanathan, 2005). Furthermore, Zhang (2001) reports that bidding firms favour equity financing when they experience positive stock returns before the acquisition. In essence, overvalued shares allow companies to acquire targets at a sufficient discount.

Limited research is done on the impact of buybacks on M&A activities and there is an ongoing debate in the literature regarding this relationship. Aboody, Kasznik & Williams (2000) show a decrease in M&A deals following buybacks and Rye (2019) reported that Canadian firms in the oil and gas sector use their corporate cash for buybacks to counter share price undervaluation, which results in a lack of M&A activity. Moreover, Jensen's findings (1986) indicate that buybacks can decrease the number of takeovers since buybacks prevent empire-building of managers. Besides, when firms repurchase stocks at the cost of their investments, as Porter (1991) argues, buybacks could lead to fewer M&A activities. Lastly, Grullon & Michaely (2004) state that firms only carry out buybacks when they are positioned in a lower growth phase. In that case, fewer M&A deals will take place surrounding stock buybacks.

On the other hand, McCune (2007) reports that the total number of stock buybacks positively relates to the total number of M&A deals in the banking space. Following the acquisition currency theory, firms buy back shares to pay with their repurchased shares in future M&A transactions due to tax advantages for the target firm. Moreover, Bagwell & Shoven (1988) argue that firms announce buybacks to take over another firm when the acquisition is made to obtain an optimal leverage ratio. Lastly, Wilber (2007) claims that repurchasing shares in order to finance an M&A deal is beneficial for a firm in the long-run since these firms enjoy tax benefits, counteract the negative effects of dilution and the negative returns following equity-financed M&A deals and share the risks with the target firm.

Additionally, managers might announce share repurchases to make stock-financed M&A deals less costly. Babenko (2009) argues that executives can anticipate on the positive stock market reaction following share repurchase announcements. Therefore, they can manipulate a company's share price, which misleads investors. Moreover, Stephens & Weisbach (1998) show that only 74% to 82% of the announced stock buybacks are actually acquired. These findings can indicate that managers do not always have the intention to repurchase shares when they announce share repurchases. Managers can push up share prices by announcing share repurchases without revealing their motive for the stock buyback or being required to follow-up on their announcement by U.S. law. Since prior research found that firms can acquire target firms at a sufficient discount when their shares are overvalued, the

question arises whether the share price increasing effect of stock buyback announcements encourages managers to announce stock buybacks before an M&A transaction. Managers can make use of share repurchase announcements to make their future takeovers less costly when they pay with their higher-priced stocks. If this is the case, managers can acquire more companies or offer higher acquisition premiums since stock-financed M&A deals become less expensive. To investigate the relationship between the stock price increasing effect of stock buyback announcements and M&A activities, this thesis formulates the following research question:

Do managers make use of the share price increasing effect of share repurchase announcements for merger and acquisition activities?

The potential managerial use of the share price increasing effect of share repurchase announcements for M&A purposes is worthwhile to examine. First, this thesis is relevant to managers in providing insights into whether they can use stock buyback announcements to acquire target firms at a sufficient discount. Next, it also provides insights for shareholders of share repurchase announcing firms, as managers might try to mislead the firm's share price by announcing stock buybacks for the use of takeovers. Moreover, insights for target firms are provided, as bidding firms might try to mislead them by manipulating their stock-financed acquisition bids. When bidders push up their firm's stock price by making use of the stock price increasing effect of share repurchase announcements, the fair value of their equity-payment bid does not have to increase as well. Lastly, this thesis is relevant to government regulators. When managers indeed boost the firm's share price by announcing repurchases to make future equity-financed acquisitions less costly without having intentions to actually repurchase shares in the future, government regulators might need to change stock price manipulation legislations.

First, this thesis examines the share price increasing effect of share repurchase announcements by performing an event study. Using a sample of 2,789 open market share repurchase announcements of 1,428 unique U.S. firms between January 1, 2010 and December 31, 2016, this research finds positive short- and long term cumulative abnormal returns (CARs) following stock buyback announcements. Moreover, the CARs remain significant for a range of sub-windows using several significance tests. These findings imply that managers can announce stock buybacks to increase the firm's share price before announcing an M&A deal. Furthermore, this thesis shows that short-term CARs following stock buyback announcements do not differ per sector.

Furthermore, this thesis performs several Probit and OLS regressions to examine the potential managerial use of the share price increasing effect of repurchase announcements for M&A purposes. This thesis does not find that firms are more likely to announce an M&A deal within one year following a buyback announcement. Moreover, this research shows that firms are less likely to pay with equity

and more likely to pay with cash for M&A deals that are announced after the firm announced a stock buyback. Furthermore, this study does not find that firms offer higher acquisition premiums for M&A deals after announcing buybacks. Besides, the relative repurchase size of repurchase announcements does not impact the likelihood of equity financing or the offered acquisition premium of M&A deals.

All in all, this thesis concludes that managers do not make use of the share price increasing effect of share repurchase announcement for M&A activities. The results indicate that the share price increasing effect of repurchase announcements does not incentivise managers to announce buybacks before an M&A deal to acquire more firms, pay with the firm's higher-priced stocks or to offer higher premiums. The results could indicate that firms that announce M&A deals after announcing buybacks have enough cash to pay buybacks and M&A deals with cash. Since stock-financed M&A deals signal overvaluation to the stock market, which leads to negative stock returns, firms might prefer cash-financed takeovers to distribute their abundant cash to their own and target shareholders. This could be especially the case when firms have cash left after funding all profitable investment opportunities. Furthermore, firms need shareholders approval to acquire firms. Since equity-financed acquisitions result in stock dilution, shareholders will favour cash-financed M&A deals. Hence, shareholders might not give their approval for equity-financed takeovers when firms have enough cash to buy back shares.

This thesis contributes to the current literature of share repurchases by providing insights into the role of share repurchase announcements in M&A activities. Research has not widely investigated this topic yet. Previous papers found that firms announce stock buybacks to prevent hostile takeover attempts. However, fewer papers examined how bidding firms, instead of target firms, can make use of stock buybacks. Bagwell & Shoven (1988) and Wilber (2007) argue why firms announce stock buybacks in order to finance takeovers. However, this thesis uses a more recent dataset. Furthermore, to the best of my knowledge, this thesis is the first work that looks into the relationship between share repurchase announcements and offered bid premiums for M&A transactions. Moreover, this thesis, as far as I know, is the first study that examines the influence of the relative size of stock buyback announcements on the payment method and the offered acquisition premium of takeovers. In the end, this thesis aims to contribute to the current literature of the managerial use of share repurchase announcements for M&A transactions and aims to fill the gap between both topics.

The remainder of this thesis is organised as follows. Chapter 2 provides an overview of the relevant existing literature regarding share repurchases and M&A transactions and establishes a link between both. Subsequently, Chapter 3 discusses the development of the hypotheses related to the research question. Chapter 4 describes the formation of the data sample and the variables used. Chapter 5 elaborates further on the methodologies of this research. Chapter 6 demonstrates the empirical results and provides answers to the hypotheses. Finally, the last chapter provides an answer to the research question, discusses the limitations of this thesis and gives suggestions for future research.

2. Literature review

This chapter presents the theoretical background and relevant academic findings in the field of share buybacks and M&A transactions. Section 2.1 discusses the different execution methods of stock buybacks, the U.S. legislation regarding stock buybacks, the stock returns surrounding share repurchase announcements and the motives of performing stock buybacks. Subsequently, Section 2.2 describes the motives, payment methods and acquisition premiums of M&A deals. Lastly, Section 2.3 creates a link between share repurchases and investments. These theories and academic findings together conduce the construction of the hypotheses shown in the next chapter.

2.1 Share repurchases

A firm can allocate corporate cash to its shareholders by employing two methods: paying out dividends and repurchasing shares. The latter has gained popularity, replacing dividends as the standard method of distributing wealth to stock investors. The grown popularity of share repurchases motivated researchers to examine the different execution methods of repurchases and the rationale behind executing them. Earlier research found multiple non-mutually exclusive motives for stock buybacks.

2.1.1 Share repurchase methods

When executives decide to buy back stocks, multiple execution options arise from which they can choose. A firm has five primary methods at its disposal through which the buybacks can be executed.

The open market stock buyback programme is the most widely chosen option to buy back stocks. Hribar, Jenkins & Johnson (2006) mention that firms executed roughly 95% of all stock buybacks in the open market during the 1990s and Busch & Obernberger (2017) report in a more recent study that firms conduct around 90% of the aggregate buyback volume in the open market. When using this method, companies launch their intentions to repurchase a pre-decided number of stocks or dollar value within a specific period. Subsequently, firms buy back their stocks at the current market price. This method portrays the flexible nature as U.S. law does not obligate firms to follow-up on their announcement. Stephens & Weisbach (1998) found that firms only acquire 74% to 82% of their announced buybacks since they can alter, postpone or terminate their programmes. Besides, no limits exist on the time duration of the programmes. This method is cost-effective as firms can decide to repurchase at a convenient time, taking advantage of share price undervaluation. Lastly, firms do not have to pay premiums or negotiate with their shareholders since they pay the prevailing market price.

Alternatively, firms could carry out fixed-price tender offers. When using this method, a firm stipulates a repurchase price that exceeds the current market price, states the number of shares it seeks and reports the offer expiration date. Shareholders are free to choose if they want to sell, tender,

their stocks for the offered price. Stock investors who agree on the offer mention how many stocks they are willing to sell. When the number of tendered stocks is undersubscribed, firms may decide to shift the expiration date to the future. If too many shareholders tender their shares, firms buy back stocks on a pro-rata basis. Tender offers are relatively less cost-effective since firms have to pay a premium. However, firms can buy back stocks within short time periods, typically around a few months. Moreover, this method provides certainty to firms since they know how many stocks they can buy back at a predetermined price before they actually repurchase them (Allen & Michaely, 2003).

The Dutch auction tender offer was introduced in 1981 and is similar to fixed-price tender offers (Bagwell, 1982). However, instead of stipulating a fixed price, firms offer a range of acceptable prices by setting a higher minimum price than the prevailing market price. Shareholders decide the number of stocks they want to sell at a price within the stated price range. After all shareholders disclose their minimum acceptable price, the firm sorts the prices from low to high. The buyback price is the lowest received price that allows a company to repurchase the number of stocks it seeks. The company pays that price to all investors who tendered their stocks below or at that price (Dann, 1981). Hence, only investors with the lowest offered prices will sell their stocks. When the number of offered stocks is undersubscribed, the company can cancel the offer or buy back all offered stocks at the maximum received price. If too many shareholders tender their shares, the firm is required to buy back from all investors who want to sell their shares below or at the repurchase price on a pro-rata basis. This method is more cost-effective than the fixed-price method as premiums are kept to a minimum.

Accelerated share repurchase (ASR) programmes enable firms to repurchase a vast amount of stocks by entering into a forward contract with an investment bank (Grullon & Ikenberry, 2000). A firm pays the investment bank cash in advance. Subsequently, the bank borrows shares from shareholders on the market and immediately delivers these shares to the firm for a set price per stock. Next, the bank returns its short position to the shareholders by buying stocks in the market over a certain time range. This method decreases the number of stocks outstanding in a short period and reduces price uncertainty for repurchasing firms. Firms pay predetermined fees to banks for transferring risks to them. This method has grown tremendously and the literature currently theorises that managers use these programmes to manipulate earnings management (e.g., Bargeron, Kulchania, & Thomas, 2011).

Lastly, privately negotiated buyback deals are less commonly used and time-consuming. Firms often choose this method when they repurchase a vast amount of shares from one or a few major shareholders to prevent the sale of large blocks of shares which could negatively impact the stock price. Firms also use this method to deter possible takeover attempts. Firms repurchase shares with a premium or discount, depending on the motive and initiator of the deal (Peyer & Vermaelen, 2005).

2.1.2 Share repurchase regulations

In 1934, the Securities Exchange Act (SEA) adopted one of the first U.S. legislations prohibiting several forms of share price manipulation (Vermaelen, 2005). Companies were deterred from conducting large scale stock buyback programmes by the threat of facing stock price manipulation fees. In 1982, the SEC introduced Rule 10b-18[1] that gives firms a safe harbour against these stock price manipulations charges. When firms do not follow these rules, they may face charges for stock price manipulation (Grullon & Ikenberry, 2000). However, the rules are not mandatory and state that companies (1) cannot buy back more than 25% of the average daily market volume calculated over the prior four calendar-weeks; (2) cannot repurchase stocks at a higher price than the last quoted transaction price or the highest independent bid, whichever is higher; (3) must buy back all stocks from one broker per trading day; and (4) are forbidden to make the opening transaction. It is forbidden for firms to trade within the first or last 30 minutes of a business day. However, when the average daily trading volume exceeds $1 million or the free float amount exceeds $150 million per business day, companies are only prohibited from trading within the first or last ten minutes of a business day.

The SEC amended the safe harbour rules in 2003 by requiring firms to disclose more complete information regarding open market buybacks. Firms need to disclose the following information in their quarterly and annual fillings (1) the monthly quantity of repurchased shares; (2) the stock's average repurchase price; (3) the total quantity of repurchased stocks under the programme; and (4) the maximum quantity of the remaining stocks that the firm can repurchase under the programme. However, regulations around stock buybacks in the U.S. are still limited. Firms only need their boards' approval and not their shareholders' approval to launch buybacks (Kim, Schremper & Varaiya, 2005).

2.1.3 Price performance following share repurchases

The consequences of buybacks have been extensively examined in prior literature and it was found that buyback events result in positive share price performances. Researchers used different periods and event windows to analyse the impact of buyback announcements of U.S. firms on their short-term stock returns and found a positive CAR range of 2.4% - 3.7% (e.g., Vermaelen, 1981; Lie, 2005; Peyer & Vermaelen, 2009). Studies outside the U.S. found more heterogeneity, which is mainly ascribed to cultural and regulatory differences (Andriosopoulos & Lasfer, 2015). According to the efficient market theory, stock prices should move towards their intrinsic value in the short-run. Therefore, no long-run excess returns after buyback announcements should occur. However, prior literature found evidence against this theory. Ikenberry et al. (1995) show an AR of 12.1% over four years and Peyer & Vermaelen (2005) report an AR of 24.25%. These findings imply that the market favours buyback announcements of U.S. firms in the long-run. Besides, Manconi et al. (2019) examined buyback announcements in the

[1] Information regarding share buyback regulations in the U.S. is obtained directly from the website of the SEC.

U.S. and 31 non-U.S. countries and also found positive abnormal returns in the short- and long-term. The so-called buyback anomaly refers to the positive excess returns that occur in the long-run after stock buyback announcements. However, Fu & Huang (2016) argue that this anomaly has vanished in the past decade since the U.S. stock market became more efficient. Lastly, studies found positive short-term excess returns following actual buybacks. Table I summarises the CAR results of prior literature.

2.1.4 Share repurchase motives

Academics found several non-mutually exclusive theories for launching stock buybacks. The undervaluation, price support and free cash flow theory directly relate to the positive stock returns following buyback announcements. Additionally, several other motives encourage stock buybacks.

Arguably the most dominant undisputed reason behind exercising buybacks is the undervaluation theory, also called the signalling theory (Vermaelen, 1981; Ofer & Thakor, 1987; Dittmar, 2000; Louis & White, 2007). This theory suggests that firms exploit share price undervaluation and captures the existence of information asymmetry between managers and shareholders. Managers are seen as insiders who have superior firm information. In contrast, shareholders are outsiders who can only rely on public information and therefore cannot correctly assess a firm's real value (Persons, 1997). When managers perceive that the firm's share price is undervalued, they can announce buybacks to signal positive prospects about the company's future financial performance to the market, which is higher than the market expectations. Shareholders consider this as a valuable signal for undervaluation, especially when the firm pays a premium (McNally, 1999). Assuming the market is semi-strong efficient and the signal is successful, the market should react immediately and a stock price increase will occur. Table I shows that the literature proves this theory by using event studies. Papers also confirm this theory by asking managers about their buyback motives (e.g., Brav et al., 2005; Bancel, Bhattacharrya & Mittoo, 2005; Tsetsekos, Kaufman & Gitman, 2011). The undervaluation signal is stronger for smaller companies. Smaller firms are more subject to asymmetric information since they have less analyst and media coverage. Therefore, stock prices from smaller firms deviate more from their intrinsic value, which gives smaller companies the probability to repurchase below the market price. Existing research finds higher excess returns following buyback announcements for smaller firms and theorises that smaller firms use buybacks for strategic reasons while larger firms use them for distributing cash (Vermaelen, 1981; Zhang, 2002; Firth & Yeung, 2005; Hou & Moskowitz, 2005; Ben-Rephael, Oded & Wohl; 2014). Moreover, firms with low market-to-book ratios, also known as value stocks, observe higher stock returns after stock buyback announcements since they are more likely to be undervalued. On the other hand, firms with high market-to-book ratios, also known as glamour stocks, experience lower stock returns. Ikenberry et al. (1995) measured the CARs following stock buyback announcements and find a four-year CAR of 45.29% for value stocks and -4.31% for glamour stocks.

Table I: Overview of Short- and Long-Term CARs Surrounding Share Repurchase Events

This table outlines the empirical outcomes from prior literature concerning stock price performances following share repurchase events by using event studies. Panel A and B document empirical findings of the literature focusing on stock buyback announcements, whereas Panel C and D document empirical findings from the literature focusing on actual stock buybacks. Significance at the 10%*, 5%** and 1%*** level, respectively.

Panel A: Short-term stock price reaction after share repurchase announcement

Country	Author(s)	Sample Period	Obs.	Event window (day)	CAR
U.S.	Vermaelen (1981)	1970-1978	243	(-1, +1)	3.67%***
	Comment & Jarrell (1991)	1994-1989	1,362	(-1, +1)	3,54%***
	Ikenberry et al. (1995)	1980-1990	1,239	(-2, +2)	3.54%***
	Stephens & Weisbach (1998)	1981-1990	591	(-1, +1)	2.69%***
	Grullon & Michaely (2004)	1980-1984	4,443	(-1, +1)	2.71%***
	Lie (2005)	1981-2000	4,729	(-1, +2)	3.00%***
	Peyer & Vermaelen (2009)	1991-2001	6,470	(-1, +1)	2.39%***
	Yook & Gangopadhyay (2011)	1994-2007	6,427	(0, +2)	2.62%***
	Manconi et al. (2019)	1998-2010	11,096	(-1, +1)	2.15%***
U.K.	Rees (1996)	1981-1990	882	(0, +2)	0.30%***
	Rau & Vermaelen (2002)	1985-1998	126	(-2, +2)	1.08%***
	Andriosopoulos & Lasfer (2015)	1997-2006	513	(-1, +1)	1.68%***
Japan	Zhang (2002)	1995-1999	126	(-1, +2)	4.58%***
Australia	Otchere & Ross (2002)	1991-1999	100	(-2, +2)	4.30%***
Germany	Seifert & Stehle (2003)	1998-2003	192	(-1, +1)	5.87%***
	Andriosopoulos & Lasfer (2015)	1997-2006	194	(-1, +1)	2.32%***
Korea	Lee, Jung & Thornton (2005)	1994-2000	268	(-1, +1)	1.60%***
France	Andriosopoulos & Lasfer (2015)	1997-2006	263	(-1, +1)	0.80%**

Panel B: Long-term stock price reaction after share repurchase announcement

Country	Author(s)	Sample Period	Obs.	Event window (year)	CAR
U.S.	Ikenberry et al. (1995)	1980-1990	1,239	4	12.14%***
	Peyer & Vermaelen (2005)	1991-2001	3,481	4	24.25%***
	Chan, Ikenberry & Lee (2007)	1991-1996	3,240	4	18.70%***
Canada	Ikenberry, Lakonishok & Vermaelen (2000)	1990-1998	1,060	3	21.40%***
	Manconi et al. (2019)	1998-2010	2,298	4	37.85%***

Panel C: Short-term stock price reaction after actual share repurchase

Country	Author(s)	Sample Period	Obs.	Event window (day)	CAR
Australia	Akyol & Foo (2013)	1998-2008	927	(0, +1)	0.43%***
Norway	Skjeltorp (2004)	1999-2000	318	(-1, +1)	0.88%***
Hong Kong	Firth & Yeung (2005)	1991-1997	677	(-1, +1)	1.30%***
	Zhang (2005)	1993-1997	800	(0, +2)	0.43%***
Malaysia	Isa & Lee (2014)	2001-2005	299	(0, +2)	1.18%***

Panel D: Long-term stock price reaction after actual share repurchase

Country	Author(s)	Sample Period	Obs.	Event window (year)	CAR
Hong Kong	Zhang (2005)	1993-1997	800	3	-1.10%***

Besides, the abnormal returns following stock buyback announcements can depend on a firm's sector. Massa, Rehman & Vermaelen (2007) report higher returns in less concentrated sectors. The market favours buyback announcements of firms operating in competitive industries less since these firms need to spend their corporate cash on innovations and investments to meet or beat the competition. However, prior literature does not widely discuss CAR differences between sectors following buyback announcements. Moreover, returns after stock buybacks depend, next to firm size, market-to-book and sector, on the credibility of the stock buyback signal. Signals can only be seen as credible if sending wrong signals causes high costs. Larger buyback volumes increase a signal's effectiveness, since the higher the volume, the higher the financial risk a firm faces. Comment & Jarrell (1991) found that buyback values of more than 20% of a firm's market capitalisation result in higher short-term returns. The literature also shows that firms can increase the signal's credibility by paying higher premiums (Asquith & Mullings, 1986) or by having skin in the game (Comment & Jarrell, 1991; Fried, 2000).

The price support theory is almost identical to the undervaluation theory. This theory entails that firms announce share repurchases to boost a company's stock price whenever they experienced a stock price decline. In contrast to the undervaluation theory, companies announce share repurchases when their share price has decreased, which not necessarily means that their share price is undervalued. Brav et al. (2005) find in their survey that CFOs state that weak stock performance is a motive to carry out share repurchase announcements. Additionally, several other papers observe an increase in stock buyback announcements after stock price drops by making use of event studies (Jagannathan, Stephens & Weisbach, 2000; Cook, Krigman & Leach, 2004; Hong, Wang & Yu, 2008).

The free cash flow theory, introduced by Jensen (1986), also explains why stock buyback announcements lead to share price increases. Free cash flow is corporate cash that is left over after a firm financed all positive net present value (NPV) investment opportunities. This hypothesis is built on the existence of agency costs which appear when a company has a separation between ownership and control. Firm's managers (agents) have different interests than their shareholders (principals) and shareholders do not have enough abilities to fully control the managers' actions. An agency conflict appears when excess corporate cash is available and both parties act in their own interest. Agents are incentivised to overinvest or to fund projects with negative NPVs (Jensen, 1986). This so-called empire-building can aim to strengthen the power and influence of managers and result in higher wages when remunerations depend on a firm's profits. On top of that, agents can increase their job security when investing results in diversification (Amihud & Lev, 1981) or requires particular human capital (Shleifer & Vishny, 1989). However, shareholders want to maximise firm value. The allocation of abundant cash by repurchasing stocks reduces the amount of cash available and therefore constrains agents from overinvesting and destroying shareholder wealth. Hence, companies with high amounts of cash available are more likely to perform stock buybacks. Several papers support this theory and show

positive price performances following stock buyback announcements when firms tend to engage in wasteful investments (Stephens & Weisbach, 1998; Dittmar, 2000; Oswald & Young, 2004; Lie, 2005).

The dividend substitution hypothesis assumes that companies prefer buybacks over dividends due to their tax advantages and flexible nature. Shareholders benefit from tax advantages of buybacks since the capital gain tax rate is below the dividend tax rate. Moreover, capital gain taxes only apply when shareholders sell their shares, which means that shareholders can postpone their taxes. On the other hand, shareholders need to pay dividend taxes immediately at the moment of the allocation. Since companies prefer pay-out methods that provide tax advantages for their shareholders, as Brown, Liang & Weisbenner (2007) argue, buybacks are an appropriate substitute for dividends. Furthermore, firms prefer share repurchases since they have a more flexible nature than dividends. The U.S. legislation regarding repurchases does not obligate firms to complete stock buyback programmes after announcing them. Besides, buybacks do not occur periodically, whereas shareholders expect dividends on a periodic basis (Stephens & Weisbach, 1998; Guay & Harford, 2000). When a company decreases the pay-out value of dividends, a negative stock market reaction occurs. The flexible nature of stock buyback announcements allows companies to deal with uncertain and volatile cash flows.

The capital structure hypothesis suggests that companies buy back stocks to achieve their optimal leverage ratio. Existing research broadly finds evidence for this theory (e.g., Dittmar, 2000; Bonaimé et al., 2014). Stock buybacks decrease the total amount of equity outstanding and cash holdings. Therefore, stock buybacks increase a firm's leverage ratio. This effect amplifies when a company issues debt to fund the stock buybacks. A firm's weighted average cost of capital (WACC) is minimised when firms achieve their optimal debt ratio and a minimised WACC increases firm value. Therefore, companies are more (less) likely to perform stock buybacks when their current leverage ratio is below (above) the target ratio (Hovakimian, Opler & Titman, 2001; Lie, 2005; Busch & Obernberger, 2017). Consequently, the optimal capital structure affects a firm's share repurchase decision.

Furthermore, the liquidity hypothesis provides another theory that explains the positive market reaction to buyback announcements. This theory states that buybacks increase stock liquidity and this increased liquidity explains the positive stock returns following repurchase announcements. However, there is an ongoing debate in the literature about the impact of stock buyback announcements on liquidity. Some argue that buybacks do not influence liquidity (Singh, Zaman & Krishnamurti, 1994; Wiggins, 1994; Miller & McConnell, 1995; Peyer & Vermaelen, 2009), while others argue that they increase liquidity (Franz, Rao & Tripathy, 1995; Grullon & Michaely, 2004; Eberhart & Siddique, 2004).

According to the takeover deterrence theory, firms use stock buybacks to lower the attractiveness of being a takeover target (Bagnoli et al., 1989; Sinha, 1991). As discussed above, stock buybacks increase a firm's leverage ratio and this higher leverage ratio decreases the attractiveness of being a takeover target. Additionally, Bagwell (1991) argues that Dutch auction tenders offers can serve as an

instrument to deter takeovers. Shareholders tender their shares at different prices in tender offers and this shareholder heterogeneity results in an upward-sloping supply curve. Therefore, companies buy back stocks with the lowest reservation values, leaving potential acquirers with the remaining stock investors who attach higher values to their shares. Subsequently, bidders have to pay a higher price for the leftover shares, which decreases the probability of an acquisition. Moreover, Nathan & Sobel (1980) found that buybacks can eliminate dissident share blocks that are likely to be sold to a hostile bidder. Furthermore, Billet & Xue (2007) support the takeover deterrence theory by showing a positive relationship between the likelihood of being a takeover target and a firm's buyback activity. Lastly, it could be that the positive stock price performance following buyback announcements immediately increases the costs of takeovers since acquirers have to bid for the firm's higher-priced shares.

The signalling power of buyback announcements could be tricky since executives can anticipate on the share price increasing effect of buyback announcements. Since Stephens & Weisbach (1998) found that firms only acquire 74% to 82% of their announced buybacks, announcements could be seen as an option that allows managers to exchange the share's market value for a higher value. Moreover, prior literature shows that executives announce more buybacks when it seems that they are under heavy pressure to raise the firm's share price (Comment & Jarrell, 1991; Babenko, 2009; Bonaimé & Ryngaert, 2013). These findings indicate that managers use buybacks to manipulate stock prices and use them for their own interests. This managerial use can mislead investors. This theory is known as the management incentive theory and managers have various motives to carry out buybacks for their own benefits. First, managers use buybacks to increase their salary. Wages consist mostly of a base wage and a bonus part. Bonuses are regularly linked to the firm's share price performance and try to align the interests of executives and shareholders since both parties benefit when the firm value is maximised. Hence, executives launch buybacks with the incentive to raise the share price with no intention of repurchasing these stocks in the future (Kahle, 2002). Second, executives are encouraged to perform repurchases when their performance links to firm value. Therefore, buybacks will increase a manager's job security. Third, buybacks are relevant for managers when they hold substantial equity stakes in the firm (Jolls, 1998; Fenn & Liang, 2001; Hackethal & Zdantchouk, 2006; Bhargava, 2013). In this case, executives use buybacks to dilute the control rights of other investors or to increase the value of their portfolio by increasing the firm's share price. Moreover, executives benefit from buybacks when the firm's share price is overvalued since the market corrects this overvaluation in the long-run. However, stock buyback announcements can support this overvaluation. Lastly, executives use buybacks to meet analysts' EPS forecasts, as EPS increases when the number of shares outstanding decreases (Almeida, Fos & Kronlund, 2016). When executives' remunerations link to meeting EPS forecasts, stock buybacks can boost wages.

Finally, literature on the motive of using share repurchases for M&A activities exists, although this is limited. The acquisition currency hypothesis assumes that firms repurchase shares to pay with these repurchased shares in future acquisitions. Paying with stock instead of cash is often more tax-efficient for the target. The capital gain tax immediately obligates the target's shareholders to pay the tax when they receive a cash bid, which is not the case for equity payments. Eckbo & Langohr (1989) found that these tax benefits for the target decrease the acquisition price, which is favourable for the acquirer. Furthermore, Gerke et al. (2002) show in their survey that managers confirm this motive for buybacks. Next, Bagwell & Shoven (1988) state that previous appreciation in the firm's stock price may positively predict acquisitions if firms make the acquisition to increase their leverage. This result indicates that managers can use buybacks for M&A activities since buyback announcements result in stock price increases. Moreover, Wilber (2007) examines why firms first repurchase stocks paid with corporate cash and thereafter use the repurchased stocks to pay the takeover rather than use cash to pay the takeover directly. Buybacks result in transaction fees and lost time, therefore there must be an advantage of repurchasing shares in order to pay a takeover. Wilber found that firms that take this extra transactional step benefit in the long-run. These firms boost the firm's stock price by announcing buybacks and therefore encounter the negative returns following announcements of paying a takeover with stock. Besides, these firms enjoy tax benefits, counteract the negative effect of dilution and share the risk with the target firm. This risk-sharing theory suggests that as target firm size increases, the acquirer prefers paying with stocks to share the risks with the target. On the other hand, when the acquirer's size exceeds the target's size, the bidder does not want to share the risk as the target does not have a high impact on the combined firm. In stock deals, the payment decision depends on the post-merger stock return of the combined firm. Hence, the overpayment of bidders is mitigated as this will induce negative returns of the bidder's stock, resulting in a lower value for the target shareholders.

2.2 Mergers and acquisitions

M&A deals are seen as large and critical transactions aim at increasing the firm's value and its strategic position (Geiger & Schiereck, 2014). Annually, firms complete thousands of M&A deals, creating a multi-trillion-dollar industry. IMAA reported a 5.86% compound annual growth rate (CAGR) of the number of transactions between 1985 and 2018 in the U.S. and the dollar value of these transactions grew at a CAGR of 5.32% (IMAA, 2020). This grown popularity drew the attention of researchers to examine the motives behind M&A deals and the payment method and bid premium in M&A deals.

2.2.1 Mergers and acquisitions motives

The rationales of firms to acquire other companies can be divided into two categories: motives that improve a company's value and motives that serve the interest of the executives (Motis, 2007).

Mukherjee et al. (2004) mention that the main reason for CFOs for M&A deals is synergy creation. Synergies refer to the ability that the sum of two or more firms generate a higher value than if they operate separately (Calipha, Tarba & Brock, 2010). Revenue and cost synergies can improve a firm's financial performance and can therefore increase a firm's value. A firm can realise synergies related to the reduction of costs due to economies of learning, scope and scale and due to the share of human capital and tangible resources. Additionally, firms acquire targets to increase their competitive advantage by increasing negotiating, market and purchasing power, creating market expansion, implementing vertical integration, creating product and geographical diversification, reducing competition, lowering the cost of external financing, increasing cross-selling and benefiting from tax advantages. Finally, managers acquire other firms when they think the target is valued under its true value.

Executives are also stimulated to engage in acquisitions for their own benefits. Empire-building could increase the influence and power of managers which leads to higher remunerations and job securities. Furthermore, the hubris hypothesis states that executives are incorrectly overconfident in their managerial abilities to manage other firms (Roll, 1986). Hence, overconfident executives are more likely to take over other companies (Malmendier & Tate, 2008). Lastly, Denis et al. (1997) found that managers want to take over other firms to diversify their own portfolios.

2.2.2 Mergers and acquisitions payment methods

The payment method is an important decision for the bidder and target firm during the M&A process. Firms regularly pay with cash, stock or a mix of both. Cash payments are often realised from internal sources or through issuing new debt and are more straightforward than stock payments. When a firm pays with its shares, the difficulty lies in the fact that the target firm cannot assure the exact value of the bid because of share price movements. When the acquirer pays with cash, there is no ambiguity about the total value the target company receives. Several factors influence the payment method.

The pecking-order theory of Myers & Majluf (1984) leans on the fact that companies prefer a financing form due to information asymmetry between a company's management and its investors. According to this theory, firms prefer cash financing over equity financing. This finding should implicate that most firms pay M&A transactions with cash.

The first factor that impacts the financing method is the firm size of the acquirer. Large companies have a more diversified capital structure than small firms. Therefore, large companies are less risky, which results in more debt capacity. When firms can obtain higher debt capacities, the probability of financing an M&A transaction with cash increases (Faccio & Masulis, 2005). Furthermore, Swieringa & Schauten (2007) found that the bidder's size positively links to the amount of cash available. Therefore, larger firms fund takeovers more often with cash. Zhang (2001) concludes that the target size positively

relates to equity financing, mainly since bidders do not have enough cash available to finance these large deals. Besides, large deals involve more asymmetric information. Following the risk-sharing theory, bidders want to share the risk with the target when the target's value is uncertain. Therefore, firms prefer stock payments when asymmetric information is high (Hansen, 1987).

In markets with asymmetric information, the payment decision reveals information to the shareholders. When an acquiring firm's management perceive their own equity as undervalued, it is costly to pay a deal with stock. Therefore, firms with undervalued stocks are more likely to finance takeovers with cash and firms prefer stock financing when they perceive their equity as overvalued (Myers & Majluf, 1984; Shleifer & Vishny, 2003; Rhodes-Kropf et al., 2005). In essence, overvalued shares allow firms to acquire other firms at a sufficient discount. Due to information asymmetry, the decision of the cash (equity) payment method signals to the market that the shares are undervalued (overvalued) and therefore creates positive (negative) excess returns for the acquirer (Travlos, 1987; Martin, 1996; Loughran & Vijh, 1997). In line with this finding, Martin (1996) and Baker & Wurgler (2002) report that firms with high market-to-book ratios, firms that are more likely to be overvalued, prefer stock financing due to the opportunity costs of paying with cash. Zhang (2001) documents that the likelihood of stock financing increases when bidders experience positive returns before the deal.

Martin (1996) states that cash payments occur more often when the bidding firm has a high amount of cash available. Cash payments take less time to complete and involve fewer transaction costs than equity payments. Furthermore, by paying with cash, firms do not signal overvaluation to the stock market. On top of that, the ownership structure of the acquirer does not change when a firm pays with cash. Cash to deal value is the ratio of the sum of cash and cash equivalents to the target value, where a high ratio represents that the bidding firm has a high amount of cash available. Jensen (1986) and Martin (1996) found that high ratios increase the likelihood of cash financing. Following the free cash flow theory, firms can benefit from cash payments whey they suffer from high agency costs (Jensen, 1986; Zhang, 2001; Swieringa & Schauten 2007).

The amount of leverage also impacts the payment decision of M&A transactions. Firms obtain debt by borrowing cash, where the amount of cash has a positive relationship with cash financing. However, the amount of debt is relatively constrained for higher leveraged companies. Moreover, the cost of debt depends on a company's capital structure. Higher leveraged companies have a higher cost of debt and therefore prefer paying with stock (Faccio & Masulis, 2005).

Lastly, paying with shares instead of cash is often more tax-efficient for the target firm (Eckbo & Langohr, 1989). These benefits for the target's shareholders will decrease the acquisition price, which is favourable for the acquirer. Furthermore, firms fund cross-industry transactions more often through cash payments (Swieringa & Schauten, 2007). This finding suggests that targets are uncertain in receiving stock as the payment method when the bidding company operates in another sector. On the

other hand, bidders prefer equity financing in this case since the target value is uncertain, which might be the case when post-takeover synergies are uncertain (Hansen, 1987; Martin, 1996).

2.2.3 Mergers and acquisitions bid premiums

A premium in an M&A deal is the difference between the estimated fair value of the target firm and the actual price paid to acquire it. These premiums represent the extra costs of an M&A deal and firms pay them to close a transaction and to ward off other bidders. Besides, firms offer premiums when they believe that the M&A transaction creates synergies (Varaiya & Ferris, 1987). The size of the premium depends on several factors. Bargeron, Schlingemann, Stulz & Zutter (2008) found that bidders pay higher premiums for public targets compared to private targets. Moreover, Betton, Eckbo & Thorbun (2008) show that firms bid higher premiums in cash payment deals. Furthermore, competitive deal processes increase the likelihood of higher premiums since firms can increase their probability of offering the winning bid when they bid a higher acquisition premium (Walkling & Edmister; 1985, Flanagan & O'Shaughnessy, 2003). Besides, in the absence of other bidders, the initial bidder can underbid due to the lack of competitors. The effect of industry relatedness deals on bid premiums is a controversial issue. Some argue that firms pay higher premiums in non-industry relatedness deals, as bidders are not familiar with the premiums paid for targets operating in other sectors. On the other hand, firms bidding for targets operating in the same industry can realise more synergies and will therefore offer a higher premium (Markides & Ittner, 1994). Lastly, Eckbo (2009) found that hostile takeovers are paid with the highest premiums compared to friendly takeovers, 61% versus 45%, respectively.

2.3 Share repurchases and their effect on investments

Now that the previous sections elaborated on the motives and fundamentals of buybacks and M&A deals, this section proceeds with the effect of buybacks on a company's investments. There is an ongoing debate in existing research about this relationship. Prior literature paid attention to the impact of stock buybacks on research and development (R&D) expenses, employment expenses and capital expenditures (CapEx). However, fewer papers studied the effect of buybacks on M&A transactions.

Firms conduct stock buybacks for several reasons and the market warmly welcomes repurchase announcements. Nevertheless, criticism on share repurchases exists as well. Porter (1991) argues that firms repurchase shares at the expense of their investments, which results in a less innovative economy since investments are a form of future value creation. Several papers support this negative relationship. First, Gruber & Kamin (2017) show that firms with declining investment spendings have increasing activities in buybacks. Moreover, Lazonick (2014) documents that S&P 500 firms used less than 10% of their earnings to reinvest in their firm and used more than 50% of their earnings to

repurchase shares. These repurchases drain earnings out of the economy and increase stock prices. However, tangible value is not created. Firms can also use their corporate cash for creating job opportunities or increasing wages instead of repurchasing shares. Hanauer (2015) goes a step further and argues that stock buybacks increase income inequality. Only large shareholders and managers benefit from stock buybacks, whereas employees suffer from them. Almeida et al. (2016) state that executives frequently decline their investments for stock buybacks to meet or beat their EPS thresholds since their performance is often related to meeting the analyst's EPS threshold. Additionally, Grullon & Ikenberry (2000) show a subsequent reduction in CapEx when firms engage in stock buybacks. Turco (2018) suggests that equity-based wages incentivise executives to focus on raising stock prices by buying back stocks at the cost of corporate investments and long-run growth. The negative impact of buybacks on investments is more present among larger firms that operate in non-competitive sectors. According to Aboody et al. (2000), repurchases negatively correlate with M&A activities. Furthermore, Rye (2019) recognise the relationship between repurchases and M&A in the Canadian oil and gas market and argues that firms suffer from stock price undervaluation and do not get enough capital injections. The number of buybacks is an indicator of the recent lack of M&A deals and this will remain as long as share prices are undervalued. However, McCune (2007) reports a positive relationship between the total amount of buybacks and the total amount of M&A deals in the banking space but does not discuss a possible explanation for this.

On the other hand, criticism that share repurchases are harmful to long-term firm value is at odds with existing studies that find evidence for the buyback anomaly. However, these results do not prove that buybacks create long-term shareholder value. If these positive stock returns simply reflect the fact that shares were priced below their intrinsic value at the moment of the buyback launching, it could be that returns would have been even more positive in the absence of the buyback announcement. However, Manconi et al. (2019) show that the extent of undervaluation is larger than any real negative effect from the repurchase (e.g. underinvestment). Furthermore, it is critical to study the influence of the level of investment opportunities on a company's investment policy. The exhaustion of a firm's growth opportunities could persuade firms to repurchase shares, rather than repurchases cause investment cuts. Firms can pay buybacks with residual capital after investment spending. A standard measure of the presence of prospective profitable investment opportunities is Tobin's Q. Grullon & Michaely (2004), Dittmar (2000) and Gutiérrez & Philippon (2016) show that firms only repurchase when there are no satisfactory investment projects. Therefore, it seems more efficient to use abundant capital for stock buybacks to reduce agency costs. However, Lee, Shin & Stultz (2016) found that firms with high Tobin's Q's also repurchase stocks, at the cost of profitable investment projects.

3. Hypotheses development

This chapter discusses how the empirical findings of the relevant existing papers presented in the previous chapter result in the development of the testable hypotheses of this thesis. Examining these constructed hypotheses will aid in answering the stated research question of this thesis.

To investigate whether managers use the share price increasing effect of share repurchase announcements for future M&A activities, examining the short- and long-term stock returns following share repurchase announcements are of substantial importance for the analyses conducted throughout this thesis. Acquisitions become less costly when firms can boost their share price before the takeover and subsequently pay with their higher-priced shares. Therefore, the generation of increased share prices is key for managers. When executives want to increase the firm's stock price a few days before announcing an M&A deal to make their stock-financed deal less costly, stock buyback announcements need to result in positive short-term abnormal returns. However, when executives want to announce share repurchases several months before announcing an M&A deal to make their equity-financed deal less expensive, stock buyback announcements need to result in positive long-term excess returns. Prior research broadly proves that stock buyback announcements are followed by significantly positive abnormal returns in the short-run and various theories explain this positive stock market reaction (e.g., Jensen, 1986; Comment & Jarrell, 1991; Chan et al., 2010). However, the efficient market theory states that stock prices should reflect their intrinsic value in the short-run. Therefore, firms should not experience long-run abnormal returns following share repurchase announcements. Nevertheless, earlier research found evidence for the buyback anomaly (e.g., Ikenberry et al., 1995; Peyer & Vermaelen, 2005; Chan et al., 2010). To examine whether positive short- and long-term market reactions following repurchase announcements are also present in the dataset of this research and in line with the articles mentioned above, the first and second hypotheses posit:

H_1: Companies experience positive short-term abnormal returns following share repurchase announcements.

H_2: Companies experience positive long-term abnormal returns following share repurchase announcements.

Hypotheses 1 and 2 analyse the overall price performance following stock buyback announcements. However, these stock returns may vary per industry. Over the past decade, S&P 500 companies conducted 70% of their total share repurchase activities in the information technology, consumer, financial and healthcare industry. On the other hand, these companies performed less than 4% of their

total share repurchase activities in the communication services, materials and utilities sector (Caplinger, 2019). This finding indicates that managers in particular sectors do not favour share repurchase announcements. It could be the case that firms in certain industries do not observe positive share price performances following stock buyback announcements. Hence, managers are less incentivised to announce share repurchases. Furthermore, firms in lagging sectors have more important capital needs than share repurchases. It is more likely that the market reacts less favourable, or even negative, to stock buyback announcements of companies that need their corporate cash to meet their capital needs. Besides, firms in competitive sectors announce fewer stock buybacks since these firms need their corporate cash for innovations and investments to preserve or achieve competitive advantages. In contrast, firms in sectors with high amounts of cash available spend more corporate cash on share buybacks and their stock buyback announcements result in higher stock returns (Jensen, 1986). According to Massa et al. (2007), firms in less concentrated industries experience higher stock returns following share repurchase announcements. In line with these findings, the stock market reaction following stock buyback announcements differs per sector. To investigate whether the stock returns after share repurchase announcements also vary per industry in this research, this thesis tests the following third hypothesis:

H_3: The market reaction following share repurchase announcements differs per industry.

Several papers argue that firms benefit when they announce a share repurchase before acquiring another firm. Eckbo & Langohr (1989) and Gerke et al. (2002) found evidence for the acquisition currency hypothesis. This theory states that managers buy back shares to pay with the repurchased shares in future M&A deals since target firms benefit from tax advantages when the bidding firm pays with shares. Moreover, Bagwell & Shoven (1988) state that the positive stock returns following stock buyback announcements positively predict acquisitions if the firm acquires another firm to achieve an optimal capital structure. On top of that, Wilber (2007) shows that bidding companies benefit in the long-run when they repurchase shares before taking over another firm. Regardless of the underlying motivation for the stock buyback announcement, managers can push up share prices by announcing share repurchases without revealing their motivation for the repurchase announcement to the market or being required to follow-up on their announcement by law. Therefore, from an executive's point of view, the share price increasing effect of stock buyback announcements can be a useful tool to make stock-financed acquisitions less costly. Consequently, this thesis expects that repurchasing firms will engage more in M&A deals since the equity-financed takeovers become less expensive. According to Wilber (2007), firms benefit in the long-run when they announce an M&A deal within one year after a company's buyback announcement. Furthermore, the literature found that firms observe positive

long-term stock returns following stock buyback announcements. Therefore, the fourth hypothesis denotes:

H_4: Companies are more likely to announce an M&A transaction within one year following a share repurchase announcement.

Since overvalued shares allow companies to acquire targets at a sufficient discount, equity-financed acquisitions become less costly for companies when they experienced a stock price increase before the M&A transaction. Since previous papers demonstrate that stock buyback announcements result in short- and long-term abnormal returns, this thesis expects that firms prefer paying with stock for an M&A deal after they announced a stock buyback. Moreover, the positive stock returns following stock buyback announcements increase a company's market-to-book ratio. Previous literature found that companies with high market-to-book ratios prefer stock financing when they acquire another company since these firms are more likely to be overvalued. Zhang (2001) also states that bidding companies prefer equity financing when they experience high stock returns before an M&A deal announcement. Furthermore, firms need to save corporate cash when they plan to execute share repurchases in the future. Therefore, the likelihood of paying an acquisition with stock increases since low amounts of cash available decrease the possibility of financing an M&A transaction with cash. Besides, a firm's leverage ratio increases when a firm takes on debt to finance the share repurchases. According to Faccio & Masulis (2005), higher leveraged companies prefer stock financing for M&A transactions. Additionally, Wilber (2007) argues that firms prefer paying with stock when they announce a stock buyback before they announce an M&A deal. Lastly, firms experience negative stock returns after equity-financed M&A deals due to the overvaluation signal (e.g., Travlos, 1987). Managers can use the share price increasing effect of share repurchase announcements to counteract these negative returns. Following these findings, this thesis expects that firms are more likely to choose stock as the payment method when they announce an M&A transaction following a share repurchase announcement. Hence, this thesis formulates the fifth hypothesis as:

H_5: Companies are more likely to pay with stock when they announce an M&A transaction within one year following a share repurchase announcement.

The signal of the company's stock buyback announcement has to be seen as credible to increase the company's stock price. Larger share repurchase sizes raise the credibility of the share repurchase announcement signal, because the higher the share repurchase value, the higher the risk a company faces. Comment & Jarrell (1991) conclude that share buybacks with a larger repurchase size result in

higher stock price returns since managers have to be more confident that the shares are currently undervalued. The more the stock price increases, the less costly it becomes to acquire another firm by paying with the higher-priced stocks. Furthermore, the larger the size of the share repurchase announcement, the less corporate liquidity is left over to finance the acquisition with cash. Additionally, when a company funds the repurchases by issuing debt, a company will become more leveraged when the repurchase value increases. According to Faccio & Masulis (2005), highly leveraged firms prefer stock financing for M&A deals. Hence, this thesis expects that the relative size of the stock buyback announcement positively impacts the probability that companies choose stock as the payment method for an M&A transaction. Therefore, this thesis constructs the following hypothesis:

H_6: The relative size of share repurchase announcements has a positive influence on the probability that companies pay with stock when they announce an M&A transaction within one year following a share repurchase announcement.

Assuming a supply curve with a gradient larger than zero for the stocks of the target firm, a higher acquisition premium will increase the likelihood of completing an M&A transaction (Walking & Edmister, 1985). Therefore, bidding companies benefit when they can offer a higher acquisition premium. When stock buyback announcements make stock-financed acquisitions indeed less costly, this thesis expects that firms bid a higher acquisition premium when they announce an M&A transaction after a share repurchase announcement. This reasoning leads to Hypothesis 7:

H_7: Companies are more likely to offer a higher acquisition premium when they announce an M&A transaction within one year following a share repurchase announcement.

Stock returns are positively related to announced stock buyback values since a higher stock buyback value increases the credibility of the signal of the stock buyback announcement. The more the stock price increases, the less expensive it becomes to offer a higher acquisition premium when a company announces a stock-financed M&A transaction. Therefore, this thesis expects that the relative size of a stock buyback announcement positively impacts the bid premium a company offers for an M&A deal. Hence, the last hypothesis states:

H_8: The relative size of share repurchase announcements has a positive influence on the acquisition premium companies offer when they announce an M&A transaction within one year following a share repurchase announcement.

4. Data

This chapter outlines the used databases and retrieved data of this research. Furthermore, this chapter describes the criteria followed in constructing the final sample and presents descriptive statistics.

4.1 Data collection

This research examines whether managers of U.S. companies use the share price increasing effect of open market share repurchase announcements for M&A deals. This thesis focuses on U.S. firms since buybacks are a large part of corporate pay-out policies of U.S. firms, whereas in other countries buybacks occur less often due to stricter legislation. Furthermore, buybacks in the U.S. are a company's option and not a commitment. Given that U.S. law does not require firms to follow-up on their announcements, U.S. firms can raise stock prices by announcing buybacks without having intentions to repurchase stocks in the future. This thesis takes only open market stock buyback programmes into account. As firms perform 90% to 95% of all stock buybacks in the open market, limiting the scope to these programmes will still yield representative results. Moreover, these programmes allow for carefully analysing the market reaction following stock buyback announcements. Lastly, due to data limitations, there is no possibility to examine other stock buyback methods since firms do not often use other methods in practice. To exclude the impact of the credit crisis of 2008, the chosen time period of this study starts on January 1, 2010 and ends on December 31, 2016. The utilisation of several databases was necessary to analyse the constructed hypotheses. They could be summarised as information on share repurchases and M&A deal announcements and stock and accounting data.

This research retrieves data on open market stock buyback announcements from the Securities Data Company (SDC) Platinum M&A Database via Thomson One Banker. Transaction information such as announcement dates, buyback values and identifying codes are available through this source. Only firms that have at least launched one announcement during the time frame are taken into account.

This thesis derives M&A announcements of U.S. public firms targeting public, private or subsidiary firms from SDC. To include the impact of start- and scale-ups, I do not use a deal value threshold. Moreover, this study only considers U.S. targets in order to exclude the potential effects of cross-border deals. Following Wilber (2007), M&A deal announcements within one year after the sample firms' buyback announcements are retrieved. Therefore, this thesis considers M&A announcements between January 1, 2010 and December 31, 2017. In line with Bargeron et al. (2008), I exclude takeover look-a-likes such as exchange offers, recapitalisations, spinoffs, minority stakes, acquisitions of remaining interest and stock buybacks. Following these criteria leads to 8,808 M&A announcements. Next, this research obtains deal data such as announcement dates, deal sizes, payment methods, firm and industry codes, deal attitudes, number of bidders, target public status and acquisition premiums.

Identifying codes, the number of shares outstanding and time-series data of daily share prices and returns, market capitalisations and trading volumes of firms are retrieved from the Centre for Research in Security Prices (CRSP). This research only includes ordinary shares with share code 10 or 11. When measuring the long-term abnormal returns, the final sample has a survivorship bias since delisted firms are excluded. Nevertheless, the dataset has enough observations to test the constructed hypotheses.

Lastly, this thesis obtains firms' quarterly accounting data from Compustat. This research primarily uses these retrieved data to construct the control variables to include in the regression models.

4.2 Sample construction

The initial dataset of U.S. public firms that announced open market stock buybacks between January 1, 2010 and December 31, 2016 comprises of 4,370 announcements of 2,369 unique firms. First, this thesis excludes share repurchase announcements without programme sizes. I also remove repurchase announcements of firms that reported to buy back more than 25% of the total number of shares outstanding since this indicates that firms launch these buybacks to deter a takeover. This criterion also excludes all going-private deals and reduces the number of buyback announcements to 4,273. After that, I drop announcements with a deal value below $1 million and without SIC codes. Next, this research removes firms with stock prices below $3 a week before the stock buyback announcement to exclude the impact of penny stocks. Next, this thesis chooses the first announcement per company as the event day and decides that the following event day is at least 30 days later. This criterion excludes confounding announcements without dropping all subsequent buyback announcements. Besides, this criterion prevents biased results by overweighing firms with relatively many buyback launchings. Consequently, the buyback sample contains 3,910 announcements of 2,134 unique firms.

To conduct research, this study merges the buyback announcement sample with three datasets. First, I match the sample with the daily stock data. This criterion excludes 717 announcements due to data limitations and 3,193 announcements remain. Of these 3,193 buyback announcements, only 2,789 announcements conducted by 1,428 unique companies remain after removing stock buyback announcements without having accounting data. I winsorize market-to-book and buyback value at the 1% level since these variables suffer from outliers. This dataset allows examining Hypotheses 1 to 3. Table II shows the number of announced stock buybacks per year of the final data sample. Repurchase announcements per year shift between 334 and 452, apart from the year 2011. It is unclear why firms announced more buybacks, 506, in 2011. However, the total repurchase value sought in 2011 is in line with the other years, whereas the total repurchase value sought was the highest in 2015. Table AI, shown in the Appendix, summarises the sample construction process and Table AII provides the distribution of stock buyback launchings per industry. Figure AI displays the number of stock buyback announcements per trading day and shows that Friday is the least popular day to announce buybacks.

Table II: Descriptive Statistics Share Repurchase Announcements

This table outlines the number of companies that announced share repurchases, the number of share repurchase announcements and the total sought share value per year between January 1, 2010 and December 31, 2016.

Year	Firms	Repurchase announcements	Total repurchase value sought by announcing firms (in USD bn)
2010	337	359	208.6
2011	451	506	277.3
2012	336	364	223.3
2013	308	336	257.4
2014	407	438	219.0
2015	405	452	314.7
2016	318	334	212.3
Total	2,562	2,789	1,172.6

After that, I drop all M&A announcements in the M&A dataset without deal sizes, SIC codes, number of bidders, premiums paid for public targets, payment methods and with a deal value below $1 million. Moreover, I exclude M&A deals that firms launched within 30 days following another M&A deal. This leads to 4,610 M&A announcements. Next, I match the M&A dataset with the buyback and Compustat data and 1,358 M&A announcements of 680 different firms remain. I winsorize deal value and repurchase size at the 1% level. This dataset allows testing Hypotheses 4 to 8. Table III summarises the number of M&A deals and transaction characteristics over the years. Firms announced 402 M&A deals within one year after they announced a buyback. Table AIII presents the sample construction process, Table AIV provides the number of M&A deals per sector and Figure AII shows M&A deals per weekday.

Table III: Descriptive Statistics M&A Announcements

This table outlines the number of share repurchasing companies that announced an M&A deal, the number of M&A announcements, the aggregate deal value of M&A announcements, the number of M&A announcements that are paid with at least 20% stock, the number of M&A announcements of public target acquisitions, the number of M&A announcements that took place within one year after a share repurchase announcement and the number of industry relatedness M&A transactions per year between January 1, 2010 and December 31, 2017.

Year	Firms	Deals	Total deal value (in USD bn)	Stock (binary)	Public target	One year within buyback	Industry relatedness
2010	152	176	86.7	30	50	34	88
2011	168	183	163.4	33	28	63	89
2012	171	200	99.3	36	43	67	87
2013	152	177	81.6	31	36	46	82
2014	176	205	244.4	60	54	60	114
2015	147	167	313.2	54	60	65	86
2016	109	118	312.4	35	49	45	54
2017	123	132	281.5	44	49	22	71
Total	1,198	1,358	1582.5	323	369	402	671

Table IV shows the summary statistics. Firms have lower average initial stock returns compared to prior research (e.g., Grullon & Michaely, 2004). Buyback value is right-skewed distributed and is similar to the one reported in Manconi et al. (2019). Repurchasing firms have large average cash ratios (0.16) and low leverage ratios (0.17), which is close to 0.16 and 0.20 (Lie, 2005). No remarkable differences are observed between firms that launched buybacks and firms that launched buybacks and M&A deals.

Table IV: Descriptive Statistics Variables

This table provides the summary statistics of U.S. firms announcing buybacks between 2010 and 2016. The number of observations, mean, median, standard deviation, minimum and maximum value and 25th and 75th percentile of the variables are presented. Panel A provides daily data of companies that launched buybacks used to examine Hypotheses 1 to 1. Panel B provides monthly data of companies that launched buybacks and M&A used to examine Hypotheses 3 to 8. Panel C provides the M&A statistics during 2010-2017 used to examine Hypotheses 5 to 8. *Buyback value* is the launched buyback value as the reduction of market value. *CAR(0,+2)* represents the cumulative excess return between day t=0 to t=2, where t=0 is the day of the buyback announcement. *CAR(+2, +10)* is the cumulative excess return between day t=2 to t=10, where t=0 is the day of the buyback announcement. *Cash* is the sum of cash and short-term investments to total assets ratio. *Firm size* is the natural logarithm of total assets. *Leverage* is the long-term debt to total assets ratio. *Liquidity* is the daily stock trading volume to the number of shares outstanding. *Market-to-book* is the market capitalisation scaled by book value. *Repurchase size* is the announced buyback value as the reduction of market value when an M&A transaction is launched within one year following a buyback announcement. *Bidders* is the number of bidding companies. *Cash payment* is the percentage of cash that is offered. *Deal size* is the announced M&A value in millions. *Premium* is the offered price for the target's stock to the target's stock price four weeks before the M&A deal. *Stock payment* is the percentage of stock that is offered. All financial numbers are in USD. *Buyback value, Market-to-book, Repurchase size* and *Deal value* are winsorized at the 1% level. Table AV shows the full descriptions and, if applicable, the computations of all variables.

Panel A: Variables of firms that announced buybacks, measured at the day of the buyback announcement

	N	Mean	Median	St. Dev.	Min	Max	P. 25	P. 75
Buyback value	2,789	0.10	0.07	0.11	0.01	0.71	0.04	0.11
CAR(0, +2)	2,789	0.01	0.01	0.06	-0.41	0.43	-0.01	0.04
CAR(+2, +10)	2,789	0.01	0.00	0.06	-0.42	0.45	-0.02	0.03
Cash	2,789	0.16	0.10	0.16	0.00	0.98	0.04	0.22
Firm size	2,789	7.82	7.70	1.92	2.77	14.76	6.50	8.97
Leverage	2,789	0.17	0.12	0.18	0.00	2.73	0.02	0.27
Liquidity	2,789	0.01	0.01	0.02	0.00	0.46	0.00	0.02
Market-to-book	2,789	2.86	2.03	4.22	-13.56	26.47	1.20	3.39

Panel B: Variables of firms that announced buybacks and M&A deals, measured at the month of the M&A announcement

	N	Mean	Median	St. Dev.	Min	Max	P. 25	P. 75
Cash	1,358	0.15	0.09	0.15	0.00	0.86	0.04	0.21
Firm size	1,358	7.99	7.96	1.80	2.77	13.65	6.72	9.14
Leverage	1,358	0.19	0.15	0.19	0.00	1.10	0.03	0.28
Market-to-book	1,358	3.15	2.26	3.82	-10.89	25.68	1.39	3.80
Repurchase size	402	0.08	0.06	0.08	0.00	0.73	0.03	0.10

Panel C: M&A deal announcement data, measured at the month of the M&A announcement

	N	Mean	Median	St. Dev.	Min	Max	P. 25	P. 75
Bidders	1,358	1.02	1.00	0.15	1.00	3.00	1.00	1.00
Cash payment	1,358	86.16	100.00	23.52	0.00	100.00	77.99	100.00
Deal value	1,358	1,165.31	160.00	3,762.18	2.60	29,367.78	41.00	606.60
Premium	372	46.51	35.64	43.28	-57.33	428.58	23.62	56.25
Stock payment	1,358	55.78	51.57	31.57	0.00	100.00	28.93	84.76

5. Methodology

This chapter describes the used methodologies necessary to test the established hypotheses.

5.1 Short-term price performance

The first section of the empirical analyses investigates the effect of stock buyback announcements on stock returns. According to Kothari & Warner (2007), event studies are an appropriate way to analyse if a certain event leads to abnormal stock returns. Event studies compare the realised stock price performances surrounding an event to the expected stock price performances by constructing a market portfolio (McWilliams & Siegel, 1997). This research counts a share repurchase announcement as an event. Academics generally use the market model or the Fama-French three-factor model to compute the abnormal returns. The results of both models do not significantly differ from each other since the extra explanatory power of including factors beyond the market model is small (Campbell, Lo & MacKinlay, 1997). Moreover, Brown & Warner (1985) report that the market model is a proper method to measure daily stock returns. Besides, previous papers widely use market models to estimate the short-term CARs surrounding buyback announcements. Following these findings, this study uses the market model to determine the short-term abnormal returns following buyback announcements.

First, the event window has to be determined. This event window comprises the number of business days surrounding a stock buyback announcement. Zhang (2002) found a positive run-up phase of 24 days in the Japanese market because of information leakage. However, the price run-up phase of U.S. firms before repurchase announcements is not similar. U.S. firms observe, on average, negative stock returns before the repurchase announcement. Most previous papers use a time frame of three to five days to capture the returns before a buyback announcement (e.g., Vermaelen, 1981; Ikenberry et al., 1995). However, to ensure that this research captures any run-up, a time frame of 21 days (-10, 10) is selected. The day of the announcement is 0. To check the robustness of the outcomes, this thesis constructs five sub-windows to measure whether the excess returns are persistent over time. The first sub-window, (-10, -1), provides an insight into the run-up phase. Following Manconi et al. (2019), (-1, +1) and (-2, +2) investigate the initial stock returns of stock buyback announcements. The fourth time frame, (0, +2), examines the impact of the stock buyback becoming public information. A short time window enables to study if excess returns are driven by the event and are not attributable to other endogenous or exogenous factors unrelated to the buyback announcement (Distler, 2017). Prior literature found that the market reacts extremely rapidly to buybacks (e.g., Vermaelen, 1981; Lie, 2005). To ensure that this research completely captures the effect of the buyback announcement, (+2, +10) measures the stock price drift after the event. However, contaminating events can impact the stock prices in extended time windows and therefore decrease the statistical power of the analysis.

Benchmarks simulate the expected stock returns during the event window and are calculated based on the value- or equally-weighted index. Value-weighted (VW) indices balance stocks based on their market capitalisation, whereas equally-weighted (EW) indices apply the same weight to each stock (Roll, 1981). Since this research computes the returns over a short period, the outcomes are not overly sensitive to the chosen index. Following Ikenberry et al. (1995) and Peyer & Vermaelen (2009), this research uses the CRSP EW index. I deem this index preferable to other indices as a fair comparison of CARs is more likely as prior research widely uses this index. Besides, this index is a broad index and - thus - representative for the U.S. stock market. In line with Wilber (2007), this thesis also performs an event study using a VW benchmark to compare the outcomes of both indices for robustness checks.

Besides, the estimation window has to be defined. This window is the period preceding the event and examines how the stock price would have behaved in the absence of the buyback announcement. Following MacKinlay (1997), this study chooses a period of 250 trading days before the event window (-260, -11). Since the selected window exceeds 200 trading days, this study assumes the event study as unit normal and as a time frame without factors affecting the buyback launching (Brown & Warner 1985). This thesis constructs the following equations to estimate the daily stock and market returns:

$$R_{i,t} = \frac{Share\ price_t - Share\ price_{t-1}}{Share\ price_{t-1}} \quad (1)$$

$$R_{\mathrm{m},t} = \frac{CRSP\ equally\text{-}weighted\ index_t - CRSP\ equally\text{-}weighted\ index_{t-1}}{CRSP\ equally\text{-}weighted\ index_{t-1}} \quad (2)$$

The first equation calculates the realised daily stock returns, $R_{i,t}$, of firms that announced buybacks. $Share\ price_{\mathrm{t}}$ represents the closing share price of company i on trading day t. $Share\ price_{t-1}$ is the closing share price on trading day $t-1$. The second formula computes the daily market returns, $R_{\mathrm{m},t}$.

This thesis examines the share price performances of the market model by using an OLS regression and the parameters of the market model, α_i, β_i and $\sigma^2_{\varepsilon_{i,t}}$. This research constructs the following formulas to compute the predicted market model returns:

$$N_{i,t} = \alpha_i + \beta_i R_{\mathrm{m},t} + \varepsilon_{i,t} \quad (3)$$
$$E(\varepsilon_{i,t}) = 0$$
$$var(\varepsilon_{i,t}) = \sigma^2_{\varepsilon_{i,t}}$$

$N_{i,t}$ represents the predicted stock return of company i on trading day t and $\varepsilon_{i,t}$ is its standard error. I subtract the predicted market model returns from the realised stock returns to find the excess returns:

$$AR_{i,t} = R_{i,t} - N_{i,t} \quad (4)$$

Finally, the estimated average CAR is the sum of the abnormal returns for the event window:

$$CAR_i(t_1, t_2) = \sum_{t=t_1}^{t_2} AR_{i,t} \quad (5)$$

5.2 Significance testing of short-term cumulative abnormal returns

This thesis performs several statistical tests to assess the significance levels of the calculated CARs of the various sub-windows. The null hypothesis states that the stock returns surrounding stock buyback announcements of U.S. firms in time frame (t_1, t_2) do not significantly differ from zero. First, this thesis uses the two-sided *t*-test to examine if buyback announcements result in abnormal market reactions:

$$t_{CAR_{(t_1,t_2)}} = \frac{CAR_{(t_1,t_2)}}{SE_{CAR_{(t_1,t_2)}}} \quad (6)$$

Where $t_{CAR_{(t_1,t_2)}}$ represents the calculated *t*-value, $CAR_{(t_1,t_2)}$ is the estimated CAR from business day t_1 to business day t_2 and $SE_{CAR_{(t_1,t_2)}}$ represents the standard error. Previous papers widely perform this test to analyse the statistical significance levels of their empirical results. However, the outcomes of this test can include downward biases in their standard deviations. Furthermore, the null hypothesis is over-rejected when stock buyback announcements in the event study cause volatility changes or small cross-sectional correlations of excess returns (Müller, 2020).

Patell (1976) established a test to tackle these statistical problems. This test standardizes the cumulative excess returns of the event periods to decrease the volatility caused by share repurchase announcements with high standard errors of stock returns. Nevertheless, event-induced variances still influence this test. Boehmer, Masumeci & Poulsen (1991) found a test (BMP test) that allows for heteroskedasticity and is therefore robust against these event-induced variances. However, Kolari and Pynnönnen (2010) argue that both proposed tests still over-reject the null hypothesis since both tests do not correct for cross-correlation of stock returns. Therefore, they introduced a new test that deals with this cross-correlation. Lastly, Cowan (1992) created the sign test that adjusts for nonnormality since this test relates the ratio of excess returns surrounding the event with excess returns in periods without events. I use all tests to study the statistical significance of the CARs of the five sub-windows.

5.3 Long-term price performance

Contrarily to short-run abnormal returns, long-run abnormal returns might be sensitive to the used methodology and index (Kothari & Warner, 2007). Following Peyer & Vermaelen (2009) and Manconi

et al. (2019), this research performs the calendar-time period (CTP) procedure introduced by Fama (1998) and the Ibbotson's Returns Across Time and Securities (IRATS) approach found by Ibbotson (1975) to estimate if abnormal returns after stock buyback announcement occur in the long-run. This research does not conduct a buy-and-hold abnormal return (BHAR) method since this method assumes cross-sectional independence (Fama, 1998) and is subject to pseudo market timing (Schultz, 2003). Moreover, Mitchell & Stafford (2000) state that the CTP approach is more powerful to find reliable evidence of long-term excess returns, even after taking cross-sectional dependence into account. This thesis combines both methods with the Fama-French three-factor model (Fama, 1993).

The CTP procedure runs single time-series regressions on constructed portfolios of monthly stock returns and adjusts for cross-sectional dependence of stock returns of companies that announced stock buybacks. This thesis constructs event portfolios for each month with companies that announced a stock buyback in the previous 3, 6, 12, 24 or 36 months. Therefore, the composition of the portfolio differs per month. This research uses daily instead of monthly stock data to increase the accuracy of the stock buyback announcement timing, which increases the reliability of the results. Besides, daily data makes a time period exactly t days, whereas the exact days of an event differ when using monthly data. The following equation is regressed to measure a portfolio's monthly excess returns:

$$R_{p,t} - R_{f,t} = a_j + b_j(R_{m,t} - R_{f,t}) + c_j HML_t + d_j SMB_t + \varepsilon_{i,t} \quad (7)$$

Where $R_{p,t}$ represents the monthly return of all companies that launched a stock buyback within month t, $R_{f,t}$ is the risk-free rate, $R_{m,t} - R_{f,t}$ stands for the market risk premium, HML_t represents the monthly return on the book-to-market value factor, SMB_t represents the monthly return on the size factor and $\varepsilon_{i,t}$ is its standard error. The coefficients are the results of the time-series regression.

The IRATS method is almost identical to the CTP procedure. However, this method incorporates changing coefficients on the risk factors during the time period, whereas the CTP method uses fixed factor loadings. Therefore, IRATS controls for stock riskiness changes. The IRATS method runs every event month a single time-series regression separately. Equation 8 shows the cross-sectional regression for each share repurchase announcement month:

$$R_{i,t} - R_{f,t} = a_j + b_j(R_{m,t} - R_{f,t}) + c_j HML_t + d_j SMB_t + \varepsilon_{i,t} \quad (8)$$

$R_{i,t}$ is the return of company i in month t that corresponds to announcement month j, where j = 0 represents the share repurchase announcement month. All other variables are the same as in Equation 7.

5.4 Cumulative abnormal return determinants

To investigate whether stock returns following buyback announcements differ per industry, this thesis performs a multivariate OLS regression. This multiple linear regression, including explanatory and control variables, will explain the dependent variable $CAR_{\mathrm{i}}(t_1, t_2)$. This method is favourable to a bivariate regression since it corrects for independent variables that impact each other. Stock returns following buyback announcements are of great importance of this research. Therefore, this thesis uses the initial market reaction following buyback announcements as the time frame of the dependent variable $CAR_{\mathrm{i}}(t_1, t_2)$. However, different sub-windows capture this initial market reaction. Hence, I select the most significant sub-window as the dependent variable by looking into the results of the various statistical significance tests of the CARs. I expect that the regression results will not significantly differ from each other when different indices for the calculation of the CARs are used since the chosen index does not overly impact the short-term returns. However, as a robustness check, I also perform an OLS regression for the CARs computed by using the VW index. Equation 9 tests Hypothesis 3:

$$CAR_i(t_1, t_2) = \beta_0 + \sum \beta_1 Industry_{i,t} + \beta_2 FirmSize_{i,t} + \beta_3 MarketToBook_{i,t} + \beta_4 Cash_{i,t} + \beta_5 BuybackValue_{i,t} + \beta_6 Leverage_{i,t} + \beta_7 Liquidity_{i,t} + \sum \beta_8 Year_{i,t} + \varepsilon_{i,t} \quad (9)$$

The variable $Industry_{i,t}$ estimates industry fixed effects and is categorised based on the SIC codes. $FirmSize_{i,t}$ and $MarketToBook_{i,t}$ capture a firm's undervaluation. Following Faccio & Masulis (2005), $FirmSize_{i,t}$ represents the natural logarithm of a firm's total assets. Natural logarithms of variables correct for outliers and create normally distributed variables. This thesis adds this variable in the regression to correct for the fact that smaller firms experience higher returns after buyback events (Vermaelen, 1981). $MarketToBook_{i,t}$ denotes a company's market-to-book ratio. Companies with a low market-to-book ratio experience higher excess returns after share repurchase announcements (Manconi et al., 2019). $Cash_{i,t}$ captures the free cash flow theory and is the sum of cash and short-term investments to total assets ratio. Firms with high cash ratios observe higher positive returns after stock buyback announcements due to agency problems (Jensen, 1986). In line with Schremper (2002), $BuybackValue_{i,t}$ is the announced buyback value as the reduction of market value. Comment & Jarrell (1991) found that stock buyback announcements with a larger repurchase size lead to higher returns. $Leverage_{i,t}$ captures the capital structure theory and represents a company's long-term debt to total assets ratio. This research includes this variable since highly leveraged firms experience lower positive returns following buyback events (Fenn & Liang, 2001). $Liquidity_{i,t}$ captures the liquidity theory and stands for the ratio of daily trading volume to the number of common shares outstanding. The impact of liquidity on abnormal returns is a controversial issue. Some argue that buybacks do not

influence liquidity (e.g., Wiggins, 1994), while others say that they increase liquidity (Grullon & Michaely, 2004). Peyer & Vermaelen (2009) found that liquidity does not affect long-run stock returns after stock buyback announcements. To examine if this finding also holds for short-term stock returns, the regression includes liquidity. $Year_{i,t}$ controls for year fixed effects such as macro-economic events and $\varepsilon_{i,t}$ represents the disturbance term. All variables represent the variables of firm i on day t.

5.5 Mergers and acquisitions timing

This research establishes a panel data Probit regression to analyse the fourth hypothesis. This regression estimates whether firms are more likely to announce an M&A deal as a bidding firm within one year after they announced a buyback. Equation 10 demonstrates the panel data Probit regression:

$$Acquirer_{i,t} = \beta_0 + \beta_1 Announcement_{i,t} + \beta_2 FirmSize_{i,t} + \beta_3 MarketToBook_{i,t} + \beta_4 Cash_{i,t} + \beta_5 Leverage_{i,t} + \sum \beta_6 Industry_{i,t} + \sum \beta_7 Year_{i,t} + \varepsilon_{i,t} \quad (10)$$

The dependent variable $Acquirer_{i,t}$ represents a binary variable that is equal to 1 for companies that announced an M&A transaction as a bidding company and is equal to 0 otherwise. $Announcement_{i,t}$ represents a binary variable that is equal to 1 for companies that announced at least one M&A transaction within one year after they announced a share repurchase and is equal to 0 otherwise. Control variables are $FirmSize_{i,t}$, $MarketToBook_{i,t}$, $Cash_{i,t}$, $Leverage_{i,t}$, $Industry_{i,t}$, and $Year_{i,t}$. All variables represent the variables of firm i on month t.

5.6 Mergers and acquisitions payment method

Furthermore, this research performs two Probit regressions to test Hypotheses 5 and 6 regarding the share repurchase announcement influence on the financing decision of an M&A deal. Equation 11 aims at examining whether a stock buyback that a firm announced within one year before an M&A deal announcement increases the likelihood of financing an M&A deal with equity.

$$Stock_{i,t} = \beta_0 + \beta_1 Announcement_{i,t} + \beta_2 FirmSize_{i,t} + \beta_3 DealSize_{i,t} + B_4 MarketToBook_{i,t} + \beta_5 Cash_{i,t} + \beta_6 Leverage_{i,t} + \beta_7 Public_{i,t} + \beta_8 Monday_{i,t} + \sum \beta_9 Industry_{i,t} + \sum \beta_{10} Year_{i,t} + \varepsilon_{i,t} \quad (11)$$

Where $Stock_{i,t}$ is a binary variable that is equal to 1 when the payment method contains at least 20% stock financing and is equal to 0 otherwise. This regression includes $FirmSize_{i,t}$ since the firm size of the bidding firm negatively affects the likelihood of equity payments (Swieringa & Schauten, 2007). According to Zhang (2001), the target's firm size positively relates to equity financing. Therefore,

$DealSize_{i,t}$ is included and represents the announced M&A deal value in USD millions. Martin (1996) found that market-to-book, cash and leverage influence the financing method of M&A deals. Consequently, this regression includes these variables. $Public_{i,t}$ is a binary variable that equals 1 when the target firm is publicly listed and equals 0 otherwise. $Monday_{i,t}$ is a binary variable that equals 1 when the firm announced the M&A deal on Monday and 0 otherwise. This variable controls for the fact that most firms announce M&A deals on Monday (Louis & Sun, 2010). Figure AII shows that this "merger Monday" effect is also present in the dataset of this thesis. All variables represent the variables of firm i on month t, where t is the month of the M&A deal announcement.

Moreover, this thesis tests the following Probit regression to examine whether the relative size of the buyback announcement that a firm launched within one year before the M&A deal announcement positively affects the likelihood of financing the M&A deal with stock. Equation 12 denotes:

$$\begin{aligned} Stock_{i,t} &= \beta_0 + \beta_1 RepurchaseSize_{i,t} + \beta_2 FirmSize_{i,t} + \beta_3 DealSize_{i,t} \\ &+ B_4 MarketToBook_{i,t} + \beta_5 Cash_{i,t} + \beta_6 Leverage_{i,t} + \beta_7 Public_{i,t} \\ &+ \beta_8 Monday_{i,t} + \sum \beta_9 Industry_{i,t} + \sum \beta_{10} Year_{i,t} + \varepsilon_{i,t} \end{aligned} \quad (12)$$

$RepurchaseSize_{i,t}$ is the announced stock buyback value as the reduction of the firm's market value when a firm announced the M&A deal within one year after it announced a stock buyback. All variables represent the variables of firm i on month t, where t is the month of the M&A deal announcement.

To examine whether firms that announced a buyback within one year before they announced an M&A deal are less likely to pay the M&A deal with cash, I use Equations 11 and 12. However, both regressions use $Cash\ bid_{i,t}$ instead of $Stock_{i,t}$ as the dependent variable, where $Cash\ bid_{i,t}$ is a binary variable that equals 1 when the M&A deal is paid with at least 80% cash and equals 0 otherwise.

5.7 Mergers and acquisitions bid premium

To shed light on the potential relationship between stock buyback announcements and announced bid premiums of M&A deals, I perform two OLS regressions. Due to data limitations, there is no possibility to examine announced bid premiums for private or subsidiary target firm takeovers. Therefore, this regression only tests public target firm acquisitions. To test Hypothesis 7, Equation 13 formulates:

$$\begin{aligned} Premium_{i,t} &= \beta_0 + \beta_1 Announcement_{i,t} + \beta_2 Stock_{i,t} \\ &+ \beta_3 Announcement{*}Stock_{i,t} + B_4 FirmSize_{i,t} + \beta_5 DealSize_{i,t} \\ &+ \beta_6 MarketToBook_{i,t} + \beta_7 Cash_{i,t} + \beta_8 Leverage_{i,t} + \beta_9 Bidders_{i,t} \\ &+ \beta_{10} Related_{i,t} + \sum \beta_{11} Industry_{i,t} + \sum \beta_{12} Year_{i,t} + \varepsilon_{i,t} \end{aligned} \quad (13)$$

The dependent variable $Premium_{i,t}$ represents the announced bid premium for deal i and is the offered price for the target´s share as a percentage of the target´s share price four weeks before the M&A announcement to account for information leakage. This regression includes $Stock_{i,t}$ to control for the fact that bid premiums are lower for stock payment transactions (Betton et al., 2008). Moreover, this regression adds an interaction term between $Announcement_{i,t}$ and $Stock_{i,t}$ as I expect that an M&A deal that is announced within one year after a stock buyback announcement has a significant positive influence on the relationship between stock financing and premium. $Bidders_{i,t}$ represents the number of firms that bid to acquire the same target. According to Walkling & Edmister (1985) and Flanagan & O'Shaughnessy (2003), the number of bidders positively relates to premium. In line with Flanagan & O'Shaughnessy (2003) and Wilber (2007), $Related_{i,t}$ is a binary variable that equals 1 when the first three numbers of the SIC code of the bidder and target firm matches and equals 0 otherwise. This variable measures whether firms bid higher premiums for non-industry or industry-relatedness deals. Eckbo (2009) found that firms pay the highest premiums for hostile deals. However, this dataset only contains four hostile deals. Therefore, this thesis does not test this effect. All variables represent the variables of firm i on month t, where t is the month of the M&A deal announcement.

Lastly, I perform an OLS regression to investigate whether the relative size of the stock buyback announcement that a firm announced within one year before the M&A deal announcement positively influences the announced bid premium of the M&A deal. Hence, Equation 14 denotes:

$$\begin{aligned} Premium_{i,t} &= \beta_0 + \beta_1 RepurchaseSize_{i,t} + \beta_2 Stock_{i,t} \\ &+ \beta_3 RepurchaseSize{*}Stock_{i,t} + B_4 FirmSize_{i,t} + \beta_5 DealSize_{i,t} \\ &+ \beta_6 MarketToBook_{i,t} + \beta_7 Cash_{i,t} + \beta_8 Leverage_{i,t} + \beta_9 Bidders_{i,t} \\ &+ \beta_{10} Related_{i,t} + \sum \beta_{11} Industry_{i,t} + \sum \beta_{12} Year_{i,t} + \varepsilon_{i,t} \end{aligned} \quad (14)$$

5.8 Ordinary least squares assumptions

To guarantee the reliability of the empirical outcomes of this research, this thesis conducts a Pearson's correlation matrix and a variance inflation factor (VIF) test to test for multicollinearity. Multicollinearity is problematic when the linear correlation between two or more independent variables exceeds an absolute value of 0.7 or when the results of the VIF tests exceed the threshold of ten (Keller & Warrack, 2003; Mansfield & Helms, 1982). A VIF test is needed to test multicollinearity since it can detect cases at which explanatory variables are interdependent. A correlation matrix ignores this interdependency.

Furthermore, the independent variables should be normally distributed. Therefore, $FirmSize$ represents a natural logarithm and several independent variables are constructed as a ratio.

Lastly, I use clustered robust standard errors to solve the issues of heteroscedasticity and autocorrelation that are observed after analysing the Breusch-Godfrey and Breusch-Pagan test results.

6. Results

This chapter presents the outcomes of the statistical analyses discussed in the previous chapter. Section 6.1 shows the multicollinearity test results. Next, Section 6.2 analyses the short-term stock returns following stock buyback announcements and Section 6.3 provides the long-term price performance after share repurchase announcements. Thereafter, Section 6.4 examines the industry effects on the short-term CARs following buyback announcements. Then, Sections 6.5, 6.6 and 6.7 investigate the impact of stock buyback announcements on M&A activities, financing methods of M&A deals and offered bid premiums in M&A transactions. The last section discusses the robustness checks.

6.1 Multicollinearity tests

Table AVI displays the Pearson's correlation matrix. As described in Chapters 4 and 5, this thesis uses daily data to test Hypotheses 1 to 3 and monthly data to test Hypotheses 4 to 8. Hypothesis 4 examines firms that only announce buybacks, whereas Hypotheses 5 to 8 focus on firms that announce buybacks and M&A deals. Therefore, the matrix provides correlation coefficients for three different panels. Multicollinearity is not present in the datasets used for Hypotheses 1 to 4 since correlations between variables do not exceed the threshold of 0.7. The matrix excludes announcement in Panel C as this variable perfectly correlates with repurchase size. This thesis does not include these two variables in the same models simultaneously. Moreover, the variables of panel C do not highly correlate when the matrix includes announcement and excludes repurchase size. Stock and cash bid are highly correlated (-0.913). This thesis does not add both variables in the same models together. Hence, multicollinearity is not a problem in the dataset used for Hypotheses 5 to 8. Moreover, Table AVII presents the VIF tests outcomes. Since no variables exceed the threshold of 10, a decent level of multicollinearity is ensured.

6.2 Short-term price performance

This section analyses the results of the short-term stock returns around buyback announcements. Table V presents the daily ARs and CARs of time frame (-10, +10), Figure I displays the CAR development of this time frame and Table VI shows the CARs of the five sub-windows and their significance levels.

Table V and Figure I show that the CARs are negative and declining before a buyback launching. ARs on trading day -10, -8, -3, -2 and -1 are negative, with a p-value smaller than 0.10. Table VI displays a CAR of -0.518% for sub-window (-10, -1), significant at the 1% level. These results are in line with the price support theory, which entails that firms announce stock buybacks to boost their stock prices after underperforming (Hong et al., 2008; Brav et al., 2005). Another plausible explanation could be that executives intend to signal undervaluation. Consequently, the firm's stock is an attractive investment. Since the ARs are negative before the buyback launching, excessive leakage seems not to take place.

Table V: Short-Term ARs and CARs Surrounding Share Repurchase Announcements (EW Index)

This table provides the daily abnormal returns (AR), the corresponding *t*-values and the cumulative abnormal returns (CAR) of 21 days surrounding a buyback launching. The returns are computed by performing an event study in combination with the market model. The time window starts ten business days before the repurchase announcement, (-10) and ends ten business days after the repurchase announcement, (+10). The estimation window ranges from day -261 to day -11. This event study used the CRSP equally-weighted index. The dataset contains 2,789 open market buyback announcements of 1,428 U.S. publicly listed firms between 2010 and 2016. Significance at the 10%*, 5%** and 1%*** level, respectively.

Day	AR (%)	*t*-value	CAR (%)
-10	-0.069*	-1.80	-0.069
-9	0.004	0.11	-0.068
-8	-0.064*	-1.73	-0.127
-7	-0.009	-0.25	-0.133
-6	-0.059	-1.50	-0.201
-5	-0.050	-1.30	-0.243
-4	-0.053	-1.37	-0.309
-3	-0.066*	-1.73	-0.374
-2	-0.078*	-1.86	-0.439
-1	-0.084*	-1.78	-0.518
0	0.691***	10.05	0.156
1	0.623***	7.69	0.762
2	0.113***	2.84	0.867
3	0.129***	3.21	0.995
4	0.105***	3.09	1.106
5	0.080**	2.42	1.189
6	0.095***	2.88	1.289
7	0.072**	2.44	1.357
8	0.088***	2.76	1.455
9	0.045	1.41	1.494
10	-0.007	-0.22	1.482

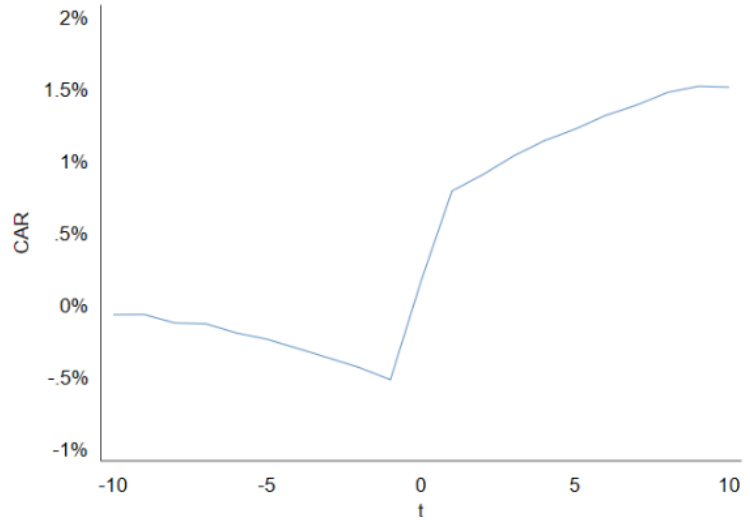

Figure I: Short-Term CARs During the Event Window (EW Index)

This figure illustrates the development of the CARs in the 21 business days around a stock buyback announcement of time window (-10, +10). T = 0 is the day of the buyback announcement. The CRSP equally-weighted index is used.

Table VI: Significance Tests of Time Windows CARs

This table provides the cumulative abnormal returns (CAR) of five sub-windows and their *t*- and *z*-values. The returns are computed by performing an event study in combination with the market model. This event study used the CRSP equally-weighted index. Window (-10, -1) measures the run-up phase of the buyback announcement, (-2, +2) and (-1, +1) capture the initial market reaction to buyback launchings, (0, +2) examines the impact of the buyback launching becoming public information and (+2, +10) examines the share price drift following the buyback launching. This thesis performed the following statistical significance tests: the cross-sectional *t*-test, the Patell test (1976), the Adjusted Patell test of Kolari and Pynnönen (2010), the Standardized cross-sectional test of Boehmer et al. (1991) (BMP test) and the Generalised Sign test of Cowan (1992). P-values are reported in parentheses. Significance at the 10%*, 5%** and 1%*** level, respectively.

		T-test	Patell test	Adjusted Patell test	BMP test	Generalised Sign test
Time window	CAR (%)	*t*-value	*z*-value	*z*-value	*z*-value	*z*-value
(-10, -1)	-0.518	-4.16*** (0.000)	-9.36*** (0.000)	-9.36*** (0.000)	-6.79*** (0.000)	-7.31*** (0.000)
(-2, +2)	1.278	10.45*** (0.000)	33.62*** (0.000)	10.93*** (0.000)	18.05*** (0.000)	21.99*** (0.000)
(-1, +1)	1.252	11.15*** (0.000)	42.24*** (0.000)	11.59*** (0.000)	19.17*** (0.000)	24.23*** (0.000)
(0, +2)	1.435	13.03*** (0.000)	49.07*** (0.000)	13.81*** (0.000)	32.58*** (0.000)	23.64*** (0.000)
(+2, +10)	0.713	6.81*** (0.000)	14.47*** (0.000)	5.32*** (0.000)	13.25*** (0.000)	12.29*** (0.000)

Table V and Figure I show that firms observe positive short-term stock market reactions after buyback announcements. The measured negative ex-ante returns and positive ex-post returns are consistent with the findings of Vermaelen (1981). The market takes the announcement rapidly into account since the highest positive returns occur at $t = 0$ and $t = 1$. Besides, the p-values are smaller than 0.05 for the ARs for the eight business days after the buyback becomes public information. As discussed in Chapter 2, existing research commonly use time windows (-2, +2), (-1, +1) and (0, +2) to compute the initial market reaction. In line with previous papers, Table VI presents positive CARs around stock buyback announcements for these three sub-windows, fluctuating between 1.252% and 1.435%. Time window (+2, +10) shows that, on average, positive returns occur from day two to ten after a buyback launching.

Moreover, Table VI provides the statistical significance test results for each sub-window. According to the cross-sectional *t*-test, the CARs in all sub-windows are statistically significant at the 1% level. Furthermore, the positive CARs of the five sub-windows remain significant at the 1% level when the tests are adjusted for volatility, event-induced variances, cross-correlation or non-normality.

These empirical results are in line with previous papers. However, the CARs of this study are lower compared to the results found in the U.S., which range from 2% to 3% (e.g., Ikenberry et al., 1995; Lie, 2005; Peyer & Vermaelen, 2009). This could indicate that the market-efficiency is higher nowadays.

This thesis also measured the ARs and CARs by using a VW index. Table AVIII and Figure AIII illustrate that the abnormal returns are slightly lower compared to the abnormal returns using an EW

benchmark. This finding implies that smaller firms observe higher excess returns after stock buyback announcements, which is consistent with Vermaelen (1981), Zhang (2002) and Firth & Yeung (2005).

Overall, the empirical outcomes present that firms, on average, experience positive short-term stock returns following buyback announcements. Hence, this thesis accepts Hypothesis 1 regarding the short-term abnormal returns following share repurchase announcements. As firms experience positive short-run abnormal returns after buyback announcements, managers can use stock buyback announcements to raise a company's stock price a few days before announcing an M&A transaction.

6.3 Long-term price performance

When managers want to make use of stock buyback announcements a few months before announcing an M&A deal, stock buyback announcements need to result in positive long-term stock returns to make equity-financed M&A transactions less costly. Therefore, this thesis measured the long-run share price performance after share repurchase announcements. This study applied the CTP procedure, as well as the IRATS method, both in combination with the Fama-French three-factor model.

Panel A of Table VII displays the results of the CTP procedure and reports average monthly excess returns of 0.43% (0.43%, 0.34%, 0.30% and 0.24%) using 3 (6, 12, 24 and 36) month event windows, significant at the 1% level. This finding implies that the buyback anomaly exists, which contradicts the conclusion from Fu & Huang (2016). The magnitude of the price performance of the 12-month window is similar compared to the findings of earlier studies, which range from 0.28% to 0.52% (Chan et al., 2007; Peyer & Vermaelen, 2009; Manconi et al., 2019). Returns are the highest in the first six months.

Furthermore, Panel B of Table VII and Figure II report the results of the computed stock returns after stock buyback announcements by using the IRATS method. The significant positive long-term excess returns of firms announcing stock buybacks remain when applying the IRATS method, are still statistically significant at the 1% level and are in line with existing research. Therefore, the robustness of the buyback anomaly does not have to be questioned in this thesis. A significant CAR of 1.34% is found (2.54%, 4.10%, 4,80% and 6.97%) for the 3 (6, 12, 24 and 36) months following a stock buyback announcement. The CARs are lower compared to the CARs of Peyer & Vermaelen (2009), who found a 36 months CAR of 18.60%. This finding could again imply that the market-efficiency is higher nowadays. Figure II illustrates that stock returns are the highest during the first six months after a stock buyback announcement and the CAR remains positive for the whole period, apart from a few small drops.

In summary, this thesis finds positive long-term ARs and CARs following buyback announcements by using the CTP and IRATS method. Therefore, this thesis provides support for the long-term persistence of abnormal returns, which is in line with existing research. Hence, Hypothesis 2 regarding the long-term returns after buyback announcements holds. These results imply that executives can announce repurchases to raise a company's share price a few months before announcing an M&A deal.

Table VII: Long-Term ARs and CARs Following Share Repurchase Announcements

This table provides the average monthly abnormal returns (AR) after stock buyback launchings. Panel A provides the monthly stock price returns, their *t*-statistics and the p-values computed by the Calendar Time Portfolio procedure in combination with the Fama-French three-factor model. For each calendar month, a portfolio is constructed, which includes companies that announced a share repurchase in the previous 3, 6, 12, 24 or 36 calendar months. This study regressed a single time-series regression on each constructed portfolio. The documented numbers are the coefficients, on average, of each run portfolio, where month 0 is the month of the stock buyback launching. Panel B provides the cumulative abnormal returns (CAR), their *t*-statistics and the p-values measured by the IRATS method in combination with the Fama-French three-factor model. A cross-sectional OLS regression is regressed on each share repurchase announcement calendar month to calculate the excess returns. The reported number is the sum of the intercept. Significance at the 10%*, 5%** and 1%*** level, respectively, performing a two-sided *t*-test.

Panel A: Fama-French Calendar-Time Period approach

	Monthly average AR (%)	*t*-value	p-value
3 Months	0.429***	3.82	0.000
6 Months	0.434***	4.23	0.000
12 Months	0.340***	4.15	0.000
24 Months	0.297***	3.84	0.000
36 Months	0.238***	3.09	0.002

Panel B: Fama-French IRATS method

Months around announcement	CAR (%)	*t*-value	p-value
(+1, +3)	1.342***	5.16	0.007
(+1, +6)	2.541***	6.59	0.000
(+1, +12)	4.100***	7.03	0.000
(+1, +24)	4.795***	4.96	0.000
(+1, +36)	6.966***	5.32	0.000

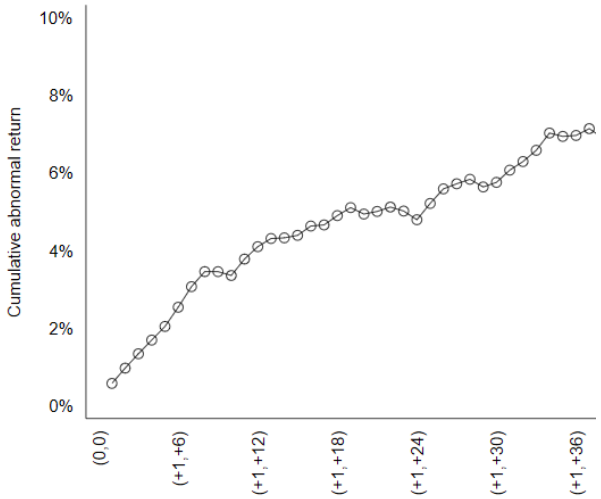

Figure II: Long-Term CARs

This figure displays the development of the CARs in the 36 months following a stock buyback announcement based on the IRATS method in combination with the Fama-French three-factor model. T = 0 is the month of the announcement.

6.4 Cumulative abnormal return determinants

To test Hypothesis 3, this research performed a multivariate OLS regression by using fixed industry effects and control variables. Table VI shows that sub-window (0, +2) is the most significant window in each performed statistical significance test. Besides, this window captures the returns after a buyback launching which is of great importance of this study. Therefore, CAR(0, +2) is selected as the dependent variable. Table VIII shows the results in which CAR(0, +2) is explained by company characteristics that link to the undervaluation (Model 1), free cash flow (Model 2), capital structure (Model 3) and liquidity (Model 4) theory. All models include the industry variable to examine whether short-term CARs differ per sector. Model 5 only includes industry effects and Model 6 adds all theories together.

Table VIII shows no remarkable differences between the full and separate models, except for the variable cash. Model 2 examines the free cash flow theory and reports a coefficient of 0.004 for cash, whereas Model 6 reports a coefficient of -0.004. However, both coefficients are insignificant.

This thesis found a coefficient of -0.003 for the variable firm size, meaning that when the natural logarithm of total assets increases with 1%, CAR(0,+2) decreases with 0.30%. This negative relationship implies that larger firms experience lower short-term returns following stock buyback announcements and is in line with Vermaelen (1981). Inconsistent with Dittmar & Field (2015) and Manconi et al. (2019), market-to-book, capturing a firm's stock price undervaluation, does not affect CAR(0, +2) since the beta is insignificant. All in all, this study obtains mixed results for the undervaluation theory.

Cash positively relates to CAR(0, +2) in Model 2. However, its coefficient is insignificant. Therefore, the free cash flow theory does not hold, which is inconsistent with existing research. Several papers found that cash positively influences the CARs after buyback launchings (e.g., Dittmar, 2000; Lie, 2005).

This thesis finds no evidence for the capital structure theory. Models 3 and 6 present a negative relationship between leverage and short-term price performance, which is in line with Dittmar (2000) and Fenn & Liang, (2001). However, the relationships in Models 3 and 6 are statistically insignificant.

Liquidity does not affect the short-term returns after repurchase announcements. The coefficients of liquidity in Models 4 and 6 are insignificant. This outcome is in line with evidence found by Peyer & Vermaelen (2009), who claim that liquidity does not impact abnormal returns after share repurchases.

In line with Vermaelen (1981) and Comment & Jarrell (1991), buyback value positively relates to short-term returns. The buyback value variable in Model 6 shows a positive sign, significant at the 1% level, meaning that when the buyback value increases, CAR(0, +2) increases. This finding indicates that larger buyback values increase the signal's credibility and therefore the short-term stock returns.

Table AIX shows that the results are almost identical compared to the results of Table VIII when all models are regressed on the CAR(0, +2) measured with a VW index. Hence, the findings are robust.

The coefficients of all industries have the same sign and almost the same size. Moreover, industry effects are insignificant in Model 6, except for the Trade and Services sectors, which are significant at

the 10% level. Model 5 displays that, even when the regression excludes all control variables, the industry effects on CAR(0, +2) do not differ per sector. These results contradict the finding of Massa et al. (2007). Since industry effects are not observed in the different regressions, Hypothesis 3 is rejected.

Table VIII: OLS Regression Results of Short-Term CARs (EW Index)

This table outlines the ordinary least squares regression outcomes for the cumulative abnormal return (CAR) after buyback launchings. *CAR(0, +2)* represents the CAR between day t=0 to t=2, where t=0 is the day of the buyback launching. *Mining* is the sector Mining & Construction, *Manufacturing* is the sector Manufacturing, *Transportation* is the sector Transportation, Communications & Utilities, *Trade* is the sector Wholesale & Retail Trade, *Finance* is the sector Finance, Insurance & Real Estate and *Services* is the sector Services. Public Administration and Agriculture, Forestry & Fishing are excluded, since they together announced 2 M&A deals. *Firm size* is the natural logarithm of total assets. *Market-to-book* is the market capitalisation to book value. *Cash* is the sum of cash and short-term investments to total assets ratio. *Buyback value* is the launched buyback value as the reduction of market value. *Leverage* is the long-term debt to total assets ratio. *Liquidity* is the daily stock trading volume to the number of shares outstanding. *Year FE* controls for fixed year effects.

	(1)	(2)	(3)	(4)	(5)	(6)
	CAR(0, +2)	CAR(0, +2)	CAR(0, +2)	CAR(0, +2)	CAR(0, +2)	CAR(0, +2)
Mining	-0.021 (-0.97)	-0.024 (-1.17)	-0.024 (-1.15)	-0.024 (-1.16)	-0.024 (-1.15)	-0.021 (-0.95)
Manufacturing	-0.033 (-1.57)	-0.036* (-1.85)	-0.036* (-1.82)	-0.036* (-1.82)	-0.035* (-1.80)	-0.033 (-1.54)
Transportation	-0.033 (-1.57)	-0.039* (-1.94)	-0.038* (-1.88)	-0.039* (-1.92)	-0.039* (-1.90)	-0.033 (-1.54)
Trade	-0.036* (-1.73)	-0.040** (-2.04)	-0.040** (-2.00)	-0.039** (-1.98)	-0.040** (-2.00)	-0.036* (-1.68)
Finance	-0.031 (-1.47)	-0.037* (-1.88)	-0.038* (-1.88)	-0.038* (-1.90)	-0.037* (-1.88)	-0.032 (-1.51)
Services	-0.038* (-1.82)	-0.040** (-2.05)	-0.040** (-2.01)	-0.040** (-2.01)	-0.040** (-2.00)	-0.038* (-1.78)
Firm size	-0.003*** (-4.31)					-0.003*** (-4.34)
Market-to-book	0.000 (0.57)					0.000 (0.66)
Cash		0.004 (0.33)				-0.004 (-0.42)
Buyback value	0.028** (2.50)	0.026** (2.32)	0.027** (2.41)	0.028** (2.44)		0.030*** (2.64)
Leverage			-0.008 (-1.26)			-0.004 (-0.60)
Liquidity				-0.108 (-0.79)		-0.098 (-0.72)
Constant	0.065*** (3.07)	0.049** (2.49)	0.051** (2.55)	0.051** (2.55)	0.051*** (2.62)	0.067*** (3.12)
Observations	2,787	2,787	2,787	2,787	2,787	2,787
R^2	0.012	0.006	0.006	0.007	0.003	0.014
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

T-statistics are presented in parentheses
* p<0.1, ** p<0.05, *** p<0.01

6.5 Mergers and acquisitions timing

Now I have proved that repurchase announcements lead to positive short- and long-run excess returns, the role of buyback announcements in M&A deals is studied. This thesis conducted a panel data Probit regression to examine whether firms that announce buybacks are more likely to announce M&A deals within one year after a buyback announcement. Table IX shows the outcomes in which the dependent variable, acquirer, is explained by the variable of interest, announcement. The dependent variable is also regressed on company characteristics that relate to a firm's likelihood of announcing an M&A deal, which is firm size in Model 1, market-to-book in Model 2, cash in Model 3 and leverage in Model 4. Model 5 only includes the variable of interest and Model 6 includes all variables simultaneously.

Before analysing whether firms are more likely to announce an M&A deal within one year after announcing a buyback, the relation between the dependent variable and control variables is discussed.

Model 6 of Table IX shows that the coefficient of firm size (0.063) is significantly positive at the 1% level, meaning that when the natural logarithm of total assets increases with 1%, the likelihood of announcing an M&A deal increases with 6.30 percentage points. This finding implies that larger firms are more likely to acquire other firms. Furthermore, as expected, market-to-book positively relates to announcing an M&A deal, significant at the 5% level in Model 2 and 10% level in Model 6. This finding implies that companies with high market-to-book ratios announce more M&A transactions.

Cash has a positive relationship with acquirer. However, the betas of cash are not statistically significant in Models 3 and 6. This result contradicts the findings of existing research. According to the free cash flow hypothesis, executives of companies with high free cash flows are incentivised to overinvest. Therefore, they are more likely to engage in acquisitions (Jensen, 1986). However, this thesis does not confirm this theory since the coefficients of cash are not statistically significant.

Lastly, the amount of leverage does not influence the probability of being an acquirer. The leverage coefficients in Models 4 and 6 are both statistically insignificant.

As shown in Table IX below, the coefficients of acquirer are positive in all models. These regression outcomes imply that firms that announce repurchases have a higher probability to announce M&A deals within one year following a stock buyback announcement. In Model 5, the coefficient of acquirer is 0.092, meaning that firms, on average, are 9.2 percentage points more likely to announce an M&A deal within one year after they announced a stock buyback. This evidence is consistent with the results of Eckbo & Langohr (1989), Gerke et al. (2002) and Wilber (2007), who found that firms announce stock buybacks for M&A purposes. This result is also in line with the theory of Bagwell & Shoven (1988), which states that previous appreciation in a firm's stock price, which can be realised by announcing stock buybacks as shown in Sections 6.2 and 6.3, positively predicts future takeovers. The coefficients of announcement are statistically significant at the 1%, 5% or 10% level in Models 1 to 5. However, the relationship becomes insignificant when Model 6 includes all control variables at the same time.

Table IX: Probit Regression Results of M&A Timing

This table outlines the panel data Probit regression outcomes for M&A activities of firms after announcing stock buybacks. *Acquirer* is a binary variable that equals 1 when a company announces an M&A deal between 2010 and 2017 and equals 0 otherwise. *Announcement* is a binary variable that is equal to 1 for companies that launched an M&A deal within one year after a buyback launching and equals 0 otherwise. *Firm size* is the natural logarithm of total assets. *Market-to-book* is the market capitalisation scaled by book value. *Cash* is the sum of cash and short-term investments to total assets ratio. *Leverage* is the long-term debt to total assets ratio. *Industry FE* and *Year FE* control for fixed industry and fixed year effects.

	(1)	(2)	(3)	(4)	(5)	(6)
	Acquirer	Acquirer	Acquirer	Acquirer	Acquirer	Acquirer
Announcement	0.044*	0.059**	0.051**	0.050*	0.092***	0.042
	(1.71)	(2.21)	(2.00)	(1.94)	(3.52)	(1.63)
Firm size	0.061***					0.063***
	(7.46)					(7.23)
Market-to-book		0.006**				0.005*
		(2.29)				(1.75)
Cash			0.044			0.093
			(0.49)			(0.92)
Leverage				0.030		-0.072
				(0.40)		(-0.85)
Constant	-2.940***	-2.544***	-2.503***	-2.499***	-2.573***	-2.949***
	(-16.91)	(-19.57)	(-61.49)	(-60.43)	(-65.38)	(-16.79)
# Months	119,274	119,131	119,274	118,236	134,411	118,090
Wald chi²	144.31	80.36	29.88	29.38	36.13	151.74
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Z-statistics are presented in parentheses
* p<0.1, ** p<0.05, *** p<0.01

To exclude the effect of start- and scale-up takeovers, this research regressed Models 1 to 6 for M&A deals exceeding a deal value of $10 million. This deal value threshold is low enough to maintain sufficient observations and high enough to only focus on M&A transactions with economic significance. Table AX presents that the outcomes do not significantly differ compared to the results of Table IX.

All in all, firms are more likely to announce an M&A deal within one year after a stock buyback announcement and this result is consistent with evidence found by previous research. However, this significant relationship does not hold when the regression controls for all company characteristics simultaneously. Therefore, Hypothesis 4 regarding the positive impact of buyback announcements on M&A deals that are announced within one year after a share repurchase announcement is rejected.

6.6 Mergers and acquisitions payment method

To test Hypotheses 5 and 6, this thesis performed two Probit regressions. Table X presents the results in which stock and cash bid are regressed on announcement or repurchase size and on company characteristics that relate to the payment method of M&A transactions. Models 1, 2, 5 and 6 test

Hypothesis 5 and investigate whether firms are more (less) likely to pay M&A deals with equity (cash) within one year after a share repurchase announcement. These models take all firms into account that announced a stock buyback and an M&A deal. Models 3, 4, 7 and 8 test Hypothesis 6 and examine whether the relative announced buyback value positively impacts the likelihood that firms pay with stock when they announce a takeover within one year after they announced a buyback. These models only focus on firms that announced an M&A deal within one year after they announced a buyback.

Before discussing the effect of buyback announcements that firms launched within one year before an M&A deal and the effect of the launched buyback size on the likelihood of paying with equity and cash in M&A deals, the relation between the payment method and control variables is discussed.

Models 2 and 4 (6 and 8) of Table X show that firm size negatively (positively) impacts the probability of equity (cash) payment, statistically significant at the 1% level. This finding is consistent with Faccio & Masulis (2005) and Swieringa & Schauten (2007). The coefficient of Model 2 (-0.142) means that when the natural logarithm of total assets increases with 1%, the likelihood of paying an M&A transaction with at least 20% stock decreases with 14.2 percentage points.

Furthermore, the relationship between deal size and the likelihood of equity payment is statistically significant at the 1% level. The coefficient of deal size is 0.0001 (-0.0001) in Models 2 and 4 (6 and 8), meaning that, on average, a $1 million increase in deal value increases (decreases) the likelihood of stock (cash) payment with 0.01 percentage points. This outcome is in line with Hansen (1987) and Zhang (2001), who concluded that the target firm size positively relates to equity financing.

Table X shows that market-to-book does not impact the probability of equity financing since the coefficients in Models 2 and 4 are statistically insignificant. This regression result is inconsistent with Martin (1996) and Baker & Wurgler (2002), who report that overvalued firms prefer paying with stock. Market-to-book even has a positive effect on cash payment in Model 6, significant at the 5% level. This finding implies that firms with high market-to-book ratios that announced an M&A deal within one year following a buyback announcement are more likely to pay the M&A deal with at least 80% cash.

Next, the sign of coefficient cash is negative in Models 2 and 4, meaning that firms with high cash ratios are less likely to pay with equity. However, this relationship is insignificant in Model 2 and only significant at the 10% level in Model 4. Moreover, the sign of the coefficient is positive in Models 6 and 8, meaning that firms with high cash ratios prefer to pay M&A deals with cash when the M&A deal is announced within one year following a share repurchase announcement. However, this relationship is insignificant in Model 6 and only significant at the 10% level in Model 8.

Furthermore, Models 2 and 4 (6 and 8) show that leverage is negatively (positively) related to the probability of stock (cash) payments, significant at the 1% level.

Lastly, Models 2 and 4 show that the probability of equity financing increases when the target company is publicly listed. M&A deals announced on Monday do not affect the payment decision.

Table X: Probit Regression Results of M&A Payment Method

This table outlines the Probit regression outcomes for the announced payment method of M&A deals of firms that also announced share repurchases. *Stock* represents a binary variable that equals 1 when the launched payment method contains at least 20% stock financing and equals 0 otherwise. *Cash bid* represents a binary variable that equals 1 when the launched payment method includes at least 80% cash financing and equals 0 otherwise. *Announcement* is a binary variable that is equal to 1 for companies that launched an M&A deal within one year after a buyback launching and equals 0 otherwise. *Repurchase size* is the announced buyback value as the reduction of market value when the M&A deal is announced within one year after the buyback announcement. *Firm size* is the natural logarithm of total assets. *Deal size* is the announced M&A value in USD millions. *Market-to-book* is the market capitalisation scaled by book value. *Cash* is the sum of cash and short-investments to total assets ratio. *Leverage* is the long-term debt to total assets ratio. *Public* is a binary variable that equals 1 for publicly listed target firms and 0 otherwise. *Monday* is a binary variable that equals 1 when the deal is launched on Monday and 0 otherwise. *Industry FE* and *Year FE* control for fixed industry and year effects.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Stock	Stock	Stock	Stock	Cash bid	Cash bid	Cash bid	Cash bid
Announcement	-0.240***	-0.219**			0.209**	0.146		
	(-2.62)	(-2.21)			(2.48)	(1.63)		
Repurchase size			-1.688	-0.752			1.470	0.730
			(-1.29)	(-0.51)			(1.40)	(0.66)
Firm size		-0.142***		-0.212***		0.172***		0.194***
		(-4.64)		(-3.13)		(5.99)		(3.57)
Deal size		0.0001***		0.0001***		-0.0001***		-0.0001***
		(5.38)		(3.73)		(-5.74)		(-3.65)
Market-to-book		-0.016		0.017		0.027**		0.007
		(-1.08)		(0.68)		(2.13)		(0.32)
Cash		-0.314		-1.250*		0.341		1.023*
		(-0.99)		(-1.81)		(1.20)		(1.78)
Leverage		-0.954***		-0.818		0.931***		0.575
		(-3.43)		(-1.58)		(3.74)		(1.25)
Public		0.803***		0.376**		-0.524***		-0.181
		(7.94)		(1.98)		(-5.59)		(-1.08)
Monday		0.007		-0.132		-0.021		0.245
		(0.08)		(-0.75)		(-0.25)		(1.46)
Constant	-1.054***	-0.014	-1.900***	-0.141	0.639***	-0.731***	1.080***	-0.651
	(-7.47)	(-0.05)	(-3.38)	(-0.18)	(5.17)	(-2.93)	(3.35)	(-1.16)
Observations	1,356	1,356	394	394	1,356	1,356	401	401
Pseudo R^2	0.146	0.250	0.174	0.258	0.085	0.173	0.079	0.147
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Z-statistics are presented in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Table X displays negative signs for the coefficients of announcement in Models 1 and 2, statistically significant at the 1% and 5% level. In Model 2, announcement contains a coefficient of -0.219, which implies that firms that announce an M&A deal within one year after announcing a buyback are 21.9 percentage points less likely to finance an M&A deal with at least 20% stock. This relationship holds in Model 1 and is even slightly stronger since the coefficient of announcement (-0.240) is more significant and negative compared to Model 2. Next, Model 5 shows a positive coefficient sign for announcement

(0.209), significant at the 5% level, meaning that firms that announce an M&A deal within one year after a buyback announcement are 20.9 percentage points more likely to pay an M&A deal with at least 80% cash. These regression outcomes do not align with expectations, are evidence against the acquisition currency theory and contradict the findings of prior literature. Zhang (2001) reports that firms prefer stock financing when they experience high stock returns before launching an M&A deal. Firms in Models 1 and 2, on average, observed positive stock returns before the M&A announcement due to the stock buyback announcements, which is shown in Sections 6.2 and 6.3. Furthermore, Wilber (2007) argues that firms benefit in the long-run when they pay takeovers with equity when they announce buybacks before launching an M&A deal. Next, Travlos (1987) argues that repurchasing firms can counteract the negative returns of equity-financed M&A deals due to the positive returns after buyback launchings. This thesis finds that repurchasing firms do not make use of the benefits.

To exclude the effect of start- and scale-up takeovers, this research regressed Models 1 to 8 for M&A deals exceeding a deal value of $10 million. From Table AXI, it is observed that the Probit regression results do not significantly differ compared to the regression results of Table X.

Overall, the results indicate that companies are less likely to pay M&A deals with equity when they announce an M&A deal within one year after a buyback announcement. This study found that firms are even more likely to pay with cash after announcing buybacks. Hence, Hypothesis 5 regarding the positive impact of buyback announcements on the likelihood of stock payment in takeovers is rejected.

Models 3 and 4 (7 and 8) show that the sign of the coefficient repurchase size is negative (positive). These signs state that firms that announced a buyback within one year before announcing an M&A deal are less (more) likely to finance an M&A deal with at least 20% equity (80% cash) when the repurchase size increases. However, these relationships are insignificant in all models, implying that the relative repurchase size does not influence the payment decision in M&A deals. These regression outcomes are not consistent with expectations. This research expected that firms are more likely to finance M&A transactions with stock since buyback values positively relate to returns after buyback launchings. These positive returns could make a takeover less costly when the firm pays with its higher-priced stocks. However, the outcomes imply that the relative buyback size does not positively impact the likelihood that a firm pays with equity for a target firm. Hence, this thesis rejects Hypothesis 6.

All in all, this research finds that firms that announce buybacks within one year before announcing an M&A deal are less (more) likely to pay with stock (cash) for M&A deals and the relative buyback value does not impact the payment decision of M&A deals. It seems that firms that repurchase shares have enough corporate cash to pay buybacks and M&A deals with cash. It could be that repurchasing firms have cash left after funding all profitable investment projects or that they are positioned in a lower growth phase. Therefore, they can use their cash by repurchasing shares and financing takeovers to distribute wealth to their shareholders and the target shareholders. Moreover, it could be the case

that repurchasing firms do not finance M&A deals with stock to avoid the negative stock returns following equity-financed M&A deals, especially when these firms have enough cash to pay buybacks. Besides, M&A deals are significant corporate decisions whereby firms need shareholders approval. Since equity-financed deals result in stock dilution, shareholders will favour cash payment. Therefore, they might not give their approval for equity-financed takeovers when firms have enough cash to repurchase shares. Next, firms experience several years of positive CARs following a buyback launching. It could be the case that firms want to capture the whole period of share price increases. Therefore, they are less likely to pay takeovers with stock after they announced a buyback within one year. It might be that they are more likely to pay takeovers with stock after three or four years.

6.7 Mergers and acquisitions bid premium

This thesis conducted two OLS regressions to provide answers to the last hypotheses. Table XI shows the results in which premium is regressed on announcement or repurchase size and on firm and deal characteristics that relate to the premium in M&A deals. Models 1 and 2 test Hypothesis 7 and examine whether firms offer a higher premium when they launch an M&A deal within one year after a buyback announcement. Models 1 and 2 take all firms into account that announced a buyback and an M&A deal. Model 3 and 4 analyse Hypothesis 8 and study whether the relative announced buyback value positively impacts premium when firms launch an M&A deal within one year after a buyback launching. Models 3 and 4 only focus on M&A deals that are launched within one year after a buyback launching.

Stock payment does not have a significant relationship with bid premium. This finding is not in line with previous research by Betton et al. (2008), who found that premiums are lower for stock payment deals. Moreover, firm size, cash and leverage also do not significantly relate to the offered premium.

The coefficient of deal size in Model 2 is -0.001, statistically significant at the 10% level, meaning that an increase of $1 million in deal value decreases the offered bid premium with 0.001. However, this significant relationship does not hold in Model 4, meaning that deal value does not influence the offered bid premium when the takeover is announced within one year after a buyback announcement

Market-to-book has positive coefficients in Models 2 and 4, which indicates that overvalued firms, on average, offer higher bid premiums. Both relationships are statistically significant at the 5% level. Furthermore, the relationship is stronger for M&A deals that are announced within one year after a buyback launching, since the coefficient in Model 4 (2.063) is higher compared to Model 2 (1.279).

The number of bidders has a positive impact on premium in Model 2, statistically significant at the 10% level, meaning that premium increases with 24.23 when the number of bidding firms increases with 1. This finding is in line with Walkling & Edmister (1985) and Flanagan & O'Shaughnessy (2003), who argue that competitive deal processes increase bid premiums. However, the relationship is insignificant for M&A deals that are announced within one year after a stock buyback announcement.

Table XI: OLS Regression Results of M&A Bid Premium

This table outlines the ordinary least squares regression outcomes for the announced bid premium of M&A deals of firms that also announced buybacks. *Premium* represents the announced bid premium and is the offered price for the target's share as a percentage of the target's share price four weeks before the M&A announcement. *Announcement* is a binary variable that is equal to 1 for companies that launched an M&A deal within one year after a buyback launching and equals 0 otherwise. *Repurchase size* is the announced buyback value as the reduction of market value when the M&A deal is announced within one year after the buyback announcement. *Stock* represents a binary variable that equals 1 when the launched payment method contains at least 20% stock financing and equals 0 otherwise. *Announcement*Stock* is the interaction between *Announcement* and *Stock*. *Repurchase size*Stock* is the interaction between *Repurchase size* and *Stock*. *Firm size* is the natural logarithm of total assets. *Deal size* is the announced M&A value in USD millions. *Market-to-book* is the market capitalisation scaled by book value. *Cash* is the sum of cash and short-investments to total assets ratio. *Leverage* is the long-term debt to total assets ratio. *Bidders* represents the number of firms bidding to acquire the same target. *Related* is a binary variable that equals 1 when the first three digits of the SIC codes of the acquirer and bidder matches and equals 0 otherwise. *Industry FE* and *Year FE* control for fixed industry and fixed year effects.

	(1)	(2)	(3)	(4)
	Premium	Premium	Premium	Premium
Announcement	2.871	-1.918		
	(0.64)	(-0.30)		
Repurchase size			57.726	36.443
			(1.31)	(0.64)
Stock		-2.623		6.315
		(-0.37)		(0.50)
Announcement*Stock		1.940		
		(0.21)		
Repurchase size*Stock				-220.461
				(-1.36)
Firm size		3.993		-1.884
		(1.59)		(-0.83)
Deal size		-0.001*		0.000
		(-1.91)		(0.14)
Market-to-book		1.279**		2.063**
		(2.48)		(2.74)
Cash		1.810		-23.583
		(0.12)		(-0.89)
Leverage		-8.660		-29.210
		(-0.62)		(-1.12)
Bidders		24.228*		19.222
		(1.77)		(1.40)
Related		8.908**		5.608
		(2.10)		(0.90)
Constant	48.265***	-15.091	69.536***	70.271**
	(4.71)	(-0.42)	(3.91)	(2.20)
Observations	372	372	122	122
R^2	0.034	0.102	0.113	0.191
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

T-statistics are presented in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Lastly, Model 2 shows that firms pay higher premiums for industry-related deals, statistically significant at the 5% level. The coefficient of Related (8.908) means that industry-related deals, on average, increase the paid premium with 8.91. This positive relationship is in line with Markides & Ittner (1994).

To exclude the effect of start- and scale-up acquisitions, this research regressed Models 1 to 4 for M&A deals exceeding a deal value of $10 million. Table AXII presents that the OLS regression results do not significantly differ compared to the results of Table XI.

Inconsistent with expectations, the coefficient of announcement in Model 2 has a negative sign, which means that firms pay lower premiums when they launch an M&A deal within one year after they announced a buyback. However, this relationship is insignificant. Therefore, this thesis concludes that announcing a buyback within one year before announcing an M&A deal does not impact the bid premium. The interaction effect of announcement and stock has a positive coefficient, which implies that using stock financing within one year after a buyback announcement leads to paying a higher bid premium. Nevertheless, this positive relationship is statistically insignificant. Following these results, Hypothesis 7 regarding the positive impact of buyback launchings on bid premiums of M&A deals that are launched within one year after a buyback launching does not hold. Hence, Hypothesis 7 is rejected.

Models 3 and 4 present that repurchase size positively relates to bid premium. However, both coefficients are insignificant. Furthermore, the interaction coefficient of repurchase size and stock has a significant negative sign. This insignificant relationship implies that an equity-financed M&A deal that is launched within one year after a stock buyback announcement does not influence the relationship between repurchase size and premium. The outcomes are not in line with expectations. This thesis expected that a larger repurchase size leads to higher premiums, as buyback size positively relates to returns after buyback announcements. This could lower the costs of bidding a higher premium since the firm can offer its higher-priced stocks. However, the results imply that the size of the buyback launching does not positively impact the bid premium of an M&A deal. Hence, Hypothesis 8 is rejected.

6.8 Robustness check

Lastly, this thesis performs Logit regressions, instead of Probit regressions, to test the robustness of the empirical outcomes of Hypotheses 4 to 6. The difference between Probit and Logit models is the distribution assumption. Both distributions are similar, except for their tails. A Probit regression assumes a cumulative standard distribution, whereas a Logit regression assumes a standard logistic distribution. The Logit regression results show that the type of model does not influence the outcomes of Hypotheses 4 to 6. Table AXIII shows the results of Hypothesis 4 by performing a Logit regression and Table AXIV shows Hypotheses 5 and 6. The Logit outcomes do not significantly differ compared to the Probit results since the sign and significance levels are similar and the coefficients only change slightly. According to these results, the results of Hypotheses 4 to 6 are robust and reliable.

7. Conclusion

This last chapter gives a summary of this research. Section 7.1 answers the research question of this thesis. Section 7.2 discusses the limitations of this study and provides suggestions for future research.

7.1 Summary

Over the past four decades, buybacks have gained popularity and prior literature documents several non-mutually exclusive reasons for these announcements. Stephens & Weisbach (1998) show that 74% to 82% of the launched buybacks is acquired. Besides, research broadly found that buyback launchings lead to positive short- and long-term abnormal returns. Babenko (2009) argues that executives can anticipate on this positive market reaction. Moreover, existing literature argues that overvalued shares allow firms to acquire targets at a sufficient discount. Combining these findings, the question arises whether managers make use of the stock price increasing effect of stock buyback launchings for M&A purposes since the higher-priced stocks will make equity-financed M&A deals less costly. To study the potential managerial use of buyback launchings, this thesis stated the following research question:

Do managers make use of the share price increasing effect of share repurchase announcements for merger and acquisition activities?

First, this study measured the short- and long-run returns following buyback announcements. Using a dataset of 2,789 open market buyback announcements of 1,428 unique U.S. firms between January 1, 2010 and December 31, 2016, a CAR of 1.435% (1.482%) for the two (ten) days following the share repurchase announcement is found. Moreover, a CAR of 4.10% is found for one year after the buyback announcement. These short- and long-term CARs are lower compared to prior studies (e.g., Ikenberry et al., 1995; Lie, 2005; Peyer & Vermaelen, 2009), which could indicate that the market-efficiency is higher nowadays. Since this research found evidence for the share price increasing effect of buyback announcements, firms can use stock buybacks before announcing an M&A deal to raise the firm's stock price. Besides, this study found that short-term CARs after buyback launchings do not differ per sector.

Thereafter, a panel data Probit regression is performed to test whether firms are more likely to announce an M&A deal within one year after they announced a buyback. This thesis found that firms announce more M&A deals within one year after a buyback announcement. However, this effect does not hold when this relationship is controlled for firm characteristics. Hence, this thesis cannot conclude that firms are more likely to announce an M&A deal within one year after a buyback announcement.

Next, this thesis performed another Probit regression to examine whether firms are more likely to pay M&A deals with stock when they announced an M&A deal within one year after they announced

a buyback. This research did not find evidence for this positive relationship. Contrary to expectations, this thesis found that firms are more likely to pay takeovers with cash after announcing share repurchases. Moreover, the relative share repurchase size does not influence the payment method of M&A deals. A possible explanation for these results is that repurchasing firms have corporate cash left after funding all profitable investment opportunities. Therefore, they use their cash for stock buybacks and M&A deals. To avoid the overvaluation signal of equity-financed M&A deals, firms prefer paying with cash. Furthermore, firms need shareholders approval for M&A transactions. Shareholders prefer cash-financed M&A deals to avoid the negative stock returns following stock-financed acquisitions.

Finally, this study tested the effect of stock buybacks announcements on the offered acquisition premiums of M&A deals. This thesis does not find evidence that announcing a stock buyback within one year before announcing an M&A deal impacts the offered bid premium. Furthermore, the relative announced buyback size does not influence the offered acquisition premium of M&A transactions.

Taking all findings into account, this research does not find evidence for the managerial use of share repurchase announcements for M&A activities. The findings imply that managers do not use the share price increasing effect of share repurchase announcements to acquire more companies, pay with their higher-priced stocks to make acquisitions less expensive or to offer higher acquisition premiums.

7.2 Limitations and suggestions for future research

The first two limitations of this thesis stem from the data sample. First, the used dataset only includes open market buybacks since information about other buyback methods is limited. However, the stock price increasing effect of tender offers is generally stronger, which might increase the incentive for managers to announce stock buybacks before announcing M&A deals. Hence, I suggest future studies to include tender offers as well. Second, this research only examined bid premiums that firms offered for publicly listed targets. However, I recommend future studies also to examine private and subsidiary targets to get more reliable results about the relationship between buyback launchings and premiums.

Moreover, this research did not examine the completion rates of the announced stock buyback programmes. Therefore, I recommend future research to examine whether firms that announce share repurchases before M&A deals are less likely to complete their announced repurchase programmes. This will provide more insights into the managerial use of stock price manipulation for M&A purposes.

Another limitation of this study is that this research only investigates buyback announcing firms. I suggest future studies to include firms that did not launch buybacks to study the differences between the payment methods and bid premiums in M&A deals of repurchasing and non-repurchasing firms.

Lastly, it might be interesting for future research to focus on share repurchase announcements that are not part of a stock buyback programme since this might be a more effective tool for managers to manipulate the firm's share price before announcing an M&A transaction.

References

Aboody, D., Kasznik, R., & Williams, M. (2000). Purchase versus pooling in stock-for-stock acquisitions: Why do firms care? *Journal of Accounting and Economics, 29*(3), 261-286.

Akyol, A. C., & Foo, C. (2013). Share repurchase reasons and the market reaction to actual share repurchases: Evidence from Australia. *International Review of Finance, 13*(1), 1-37.

Allen, F., & Michaely, R. (2003). Payout policy. In *Handbook of the Economics of Finance* (Vol. 1, pp. 337-429). Elsevier.

Almeida, H., Fos, V., & Kronlund, M. (2016). The real effects of share repurchases. *Journal of Financial Economics, 119*(1), 168-185.

Amihud, Y., & Lev, B. (1981). Risk reduction as a managerial motive for conglomerate mergers. *The Bell Journal of Economics, 12*(2), 605-617.

Andriosopoulos, D., & Lasfer, M. (2015). The market valuation of share repurchases in Europe. *Journal of Banking & Finance, 55*, 327-339.

Asquith, P., & Mullins, D. (1986). Signalling with dividends, stock repurchases, and equity issues. *Financial Management, 15*(3), 27-44.

Babenko, I. (2009). Share repurchases and pay-performance sensitivity of employee compensation contracts. *The Journal of Finance, 64*(1), 117-150.

Bagnoli, M., Gordon, R., & Lipman, B. (1989). Stock repurchase as a takeover defense. *The Review of Financial Studies, 2*(3), 423-443.

Bagwell, L. S. (1991). Share repurchase and takeover deterrence. *The Rand Journal of Economics, 22*(1), 72-88.

Bagwell, L. S. (1992). Dutch auction repurchases: An analysis of shareholder heterogeneity. *The Journal of Finance, 47*(1), 71-105.

Bagwell, L. S., & Shoven, J. (1988). Share repurchases and acquisitions: An analysis of which firms participate. In *A.G. Auerbach, ed. Corporate Takeovers: Causes and Consequences* (pp. 191-220). Chicago: University of Chicago.

Bagwell, L. S., & Shoven, J. B. (1989). Cash distributions to shareholders. *Journal of Economic Perspectives, 3*(3), 129-140.

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

Bancel, F., Mittoo, U., & Bhattacharyya, N. (2005). *Cross-country determinants of payout policy: A survey of European firms* (SSRN Working Paper No. 683111). http://dx.doi.org/10.2139/ssrn.683111

Bargeron, L. L., Schlingemann, F., Stulz, R., & Zutter, C. (2008). Why do private acquirers pay so little compared to public acquirers? *Journal of Financial Economics, 89*(3), 375-390.

Bargeron, L., Kulchania, M., & Thomas, S. (2011). Accelerated share repurchases. *Journal of Financial Economics, 101*(1), 69-89.

Ben-Rephael, A., Oded, J., & Wohl, A. (2014). Do firms buy their stock at bargain prices? Evidence from actual stock repurchase disclosures. *Review of Finance, 18*(4), 1299-1340.

Betton, S., Eckbo , B., & Thorburn, K. (2008). Corporate takeovers. In *Handbook of Empirical Corporate Finance* (pp. 291-429). Elsevier.

Bhargava, A. (2013). Executive compensation, share repurchases and investment expenditures: Econometric evidence from US firms. *Review of Quantitative Finance and Accounting, 40*(3), 403-422.

Billett, M. T., & Xue, H. (2007). The takeover deterrent effect of open market share repurchases. *The Journal of Finance, 62*(4), 1827-1850.

Boehmer, E., Masumeci, J., & Poulsen, A. (1991). Event-study methodology under conditions of event-induced variance. *Journal of Financial Economics, 70*(2), 253-272.

Bonaimé, A. A., & Ryngaert, M. (2013). Insider trading and share repurchases: Do insiders and firms trade in the same direction? *Journal of Corporate Finance, 22*, 35-53.

Bonaimé, A. A., Öztekin, Ö., & Warr, R. S. (2014). Capital structure, equity mispricing, and stock repurchases. *Journal of Corporate Finance, 26*, 182-200.

Brav, A., Graham, J., Harvey, C., & Michaely, R. (2005). Payout policy in the 21st century. *Journal of Financial Economics, 77*(3), 483-527.

Brown, J. R., Liang, N., & Weisbenner, S. (2007). Executive financial incentives and payout policy: Firm responses to the 2003 dividend tax cut. *The Journal of Finance, 62*(4), 1935-1965.

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

Busch, P., & Obernberger, S. (2017). Actual share repurchases, price efficiency, and the information content of stock prices. *The Review of Financial Studies, 30*(1), 324-362.

Calipha, R., Tarba, S., & Brock, D. (2010). Mergers and acquisitions: A review of phases, motives and success factors. *Advances in Mergers and Acquisitions, 9*(1), 1-24.

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

Caplinger, D. (2019, May 20). *A foolish take: Which sectors do the most stock buybacks?* Retrieved from The Motley Fool: https://www.fool.com/investing/2019/05/20/a-foolish-take-which-sectors-do-the-most-stock-buy.aspx

Chan, K., Ikenberry, D., & Lee, I. (2007). Do managers time the market? Evidence from open-market share repurchases. *Journal of Banking & Finance, 31*(9), 2673-2694.

Chen, S. S., & Wang, Y. (2012). Financial constraints and share repurchases. *Journal of Financial Economics, 105*(2), 311-331.

Comment, R., & Jarrell, G. A. (1991). The relative signalling power of Dutch-auction and fixed-price self-tender offers and open-market share repurchases. *The Journal of Finance, 46*(4), 1243-1271.

Cook, D. O., Krigman, L., & Leach, J. (2004). On the timing and execution of open market repurchases. *The Review of Financial Studies, 17*(2), 463-498.

Cowan, A. R. (1992). Nonparametric event study tests. *Review of Quantitative Finance and Accounting, 2*(4), 343-358.

Dann, L. Y. (1981). Common stock repurchases: An analysis of return to bondholders and stockholders. *Journal of Financial Economics, 9*(2), 113-138.

Denis, D. J., Denis, D., & Sarin, A. (1997). Managerial incentives and corporate diversification strategies. *Journal of Applied Corporate Finance, 10*(2), 72-80.

Distler, J. (2017). *Acquisitions by emerging multinational corporations: Motivation and performance of transactions in Western Europe and North America.* Springer.

Dittmar, A. (2000). Why do firms repurchase stock. *The Journal of Business, 73*(3), 331-355.

Dittmar, A., & Field, L. (2015). Can managers time the market? Evidence using repurchase data. *Journal of Financial Economics, 115*(2), 261-282.

Eberhart, A., & Siddique, A. (2004). Why are stock buyback announcements good news? *Philadelphia Meetings Paper*.

Eckbo, B. E. (2009). Bidding strategies and takeover premiums: A review. *Journal of Corporate Finance, 15*(1), 149-178.

Eckbo, B. E., & Langohr, H. (1989). Information disclosure, method of payment, and takeover premiums: Public and private tender offers in France. *Journal of Financial Economics, 24*, 363-402.

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

Fama, E. F. (1993). Common risk factors in the returns on stocks and bonds. *Journal of Financial Economics, 33*(1), 3-56.

Fama, E. F. (1998). Market efficiency, long-term returns, and behavioral finance. *Journal of Financial Economics, 49*(3), 283-306.

Fenn, G. W., & Liang, N. (2001). Corporate payout policy and managerial stock incentives. *Journal of Financial Economics, 60*(1), 45-72.

Firth, M., & Yeung, C. (2005). An empirical investigation of share buybacks in Hong Kong. *Journal of Emerging Market Finance, 4*(3), 207-225.

Flanagan, D. J., & O'Shaughnessy, K. C. (2003). Core-related acquisitions, multiple bidders and tender offer premiums. *Journal of Business Research, 56*(8), 573-585.

Franz, D. R., Rao, R., & Tripathy, N. (1995). Informed trading risk and bid-ask spread changes around open market stock repurchases in the Nasdaq market. *Journal of Financial Research, 18*(3), 311-327.

Fried, J. M. (2000). Insider signaling and insider trading with repurchase tender offers. *The University of Chicago Law Review, 67*(2), 421-477.

Fu, F., & Huang, S. (2016). The persistence of long-run abnormal returns following stock repurchases and offerings. *Management Science, 62*(4), 964-984.

Geiger, F., & Schiereck, D. (2014). The influence of industry concentration on merger motives - Empirical evidence from machinery industry mergers. *Journal of Economics and Finance, 38*(1), 27-52.

Gerke, W., Fleischer, J., & Langer, M. (2002). Kurseffekte durch aktienrückkäufe - Eine empirische untersuchung für den Deutschen kapitalmarkt. *Bewertung von Unternehmen: Strategie–Markt–Risiko, Kongress-Dokumentation, Deutscher Betriebswirtschafter-Tag, 56*, 275-304.

Gruber, J., & Kamin, S. (2017, April 11). *Corporate buybacks and capital investment: An international perspective.* Retrieved from Board of Governors of the Federal Reserve System: https://www.federalreserve.gov/econres/notes/ifdp-notes/corporate-buybacks-and-capital-investment-an-international-perspective-20170411.htm

Grullon, G., & Ikenberry, D. L. (2000). What do we know about stock repurchases? *Journal of Applied Corporate Finance, 13*(1), 31-51.

Grullon, G., & Michaely, R. (2002). Dividends, share repurchases, and the substitution hypothesis. *The Journal of Finance, 57*(4), 1649-1684.

Grullon, G., & Michaely, R. (2004). The information content of share repurchase programs. *The Journal of Finance, 59*(2), 651-680.

Guay, W., & Harford, J. (2000). The cash-flow permanence and information content of dividend increases versus repurchases. *Journal of Financial Economics, 57*(3), 385-415.

Gutiérrez, G., & Philippon, T. (2016). *Investment-less growth: An empirical investigation (*National Bureau of Economic Research Working Paper No. w22897). https://www.nber.org/papers/w22897

Hackethal, A., & Zdantchouk, A. (2006). Signaling power of open market share repurchases in Germany. *Financial Markets and Portfolio Management, 20*(2), 123-151.

Hanauer, N. (2015, February 8). *Stock buybacks are killing in the American economy*. Retrieved from The Atlantic: https://www.theatlantic.com/politics/archive/2015/02/kill-stock-buyback-to-save-the-american-economy/385259/

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

Heron, R., & Lie, E. (2002). Operating performance and the method of payment in takeovers. *Journal of Financial and Quantitative Analysis, 37*(1), 137-155.

Hong, H., Wang, J., & Yu, J. (2008). Firms as buyers of last resort. *Journal of Financial Economics, 88*(1), 119-145.

Hou, K., & Moskowitz, T. (2005). Market frictions, price delay, and the cross-section of expected returns. *The Review of Financial Studies, 18*(3), 981-1020.

Hovakimian, A., Opler, T., & Titman, S. (2001). The debt-equity choice. *Journal of Financial and Quantitative Analysis, 36*(1), 1-24.

Hribar, P., Jenkins, N. T., & Johnson, W. B. (2006). Stock Repurchases as an earnings management device. *Journal of Accounting and Economics, 41*(1-2), 3-27.

Ibbotson, R. G. (1975). Price performance of common stock new issues. *Journal of Financial Economics, 2*(3), 235-272.

Ikenberry, D. L., & Vermaelen, T. (1996). The option to repurchase stock. *Financial Management, 25*(4), 9-24.

Ikenberry, D., Lakonishok, J., & Vermaelen, T. (1995). Market underreaction to open market share repurchases. *Journal of Financial Economics, 39*(2-3), 181-208.

Ikenberry, D., Lakonishok, J., & Vermaelen, T. (2000). Stock repurchases in Canada: Performance and strategic trading. *The Journal of Finance, 55*(5), 2373-2397.

Institute, I. (2020). *United States - M&A statistics*. Retrieved from IMAA Institute: https://imaa-institute.org/m-and-a-us-united-states/

Isa, M., & Lee, S. (2014). Market reactions to share repurchase announcements in Malaysia. *Asian Academy of Management Journal of Accounting & Finance, 10*(1), 45-73.

Jagannathan, M., Stephens, C., & Weisbach, M. (2000). Financial flexibility and the choice between dividends and stock repurchases. *Journal of Financial Economics, 57*(3), 355-384.

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

Jolls, C. (1998). *Stock repurchases and incentive compensation* (National Bureau of Economic Research Working Paper No. 6467). https://www.nber.org/papers/w6467

Kahle, K. M. (2002). When a buyback isn't a buyback: Open market repurchases and employee options. *Journal of Financial Economics, 63*(2), 235-261.

Keller, G., & Warrack, B. (2003). Statistics for management and economics (with info trac). *Instructor*.

Kim, J., Schremper, R., & Varaiya, N. P. (2005). Open market repurchase regulations: A cross-country examination. *Corporate Finance Review, 9*, 29-38.

Kolari, J. W., & Pynnönen, S. (2010). Event study testing with cross-sectional correlation of abnormal returns. *The Review of Financial Studies, 23*(11), 3996-4025.

Kothari, S., & Warner, J. (2007). Econometrics of event studies. In *Handbook of Empirical Corporate Finance* (pp. 3-36). North-Holland: Elsevier.

Lakonishok, J., & Vermaelen, T. (1990). Anomalous price behavior around repurchase tender offers. *The Journal of Finance, 45*(2), 455-477.

Lazonick, W. (2014). Profits without prosperity. *Harvard Business Review, 92*(9), 46-55.

Lee, D., Shin, H., & Stulz, R. (2016). *Why does capital no longer flow more to the industries with the best growth opportunities?* (National Bureau of Economic Research Working Paper No. 22924). https://www.nber.org/papers/w22924

Lee, Y. G., Jung, S., & Thornton Jr, J. (2005). Long-term stock performance after open-market repurchases in Korea. *Global Finance Journal, 16*(2), 191-209.

Lie, E. (2005). Operation performance following open market share repurchase announcements. *Journal of Accounting and Economics, 39*(3), 411-436.

Liu, H., & Swanson, E. (2016). Is price support a motive for increasing share repurchases? *Journal of Corporate Finance, 38*, 77-91.

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

Louis, H., & Sun, A. (2010). Investor attention and the market reaction to merger announcements. *Management Science, 56*(10), 1781-1793.

Louis, H., & White, H. (2007). Do managers intentionally use repurchase tender offers to signal private information? Evidence from firm financial reporting behavior. *Journal of Financial Economics, 85*(1), 205-233.

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

Malmendier, U., & Tate, G. (2008). Who makes acquisitions? CEO overconfidence and the market's reaction. *Journal of Financial Economics, 89*(1), 20-43.

Manconi, A., Peyer, U., & Vermaelen, T. (2019). Are buybacks good for long-term shareholder value? Evidence from buybacks around the world. *Journal of Financial and Quantitative Analysis, 54*(4), 1899-1935.

Mansfield, E. R., & Helms, B. (1982). Detecting multicollinearity. *The American Statistician, 36*(3a), 158-160.

Markides, C. C., & Ittner, C. (1994). Shareholder benefits from corporate international diversification: Evidence from US international acquisitions. *Journal of International Business Studies, 25*(2), 343-366.

Martin, K. J. (1996). The method of payment in corporate acquisitions, investment opportunities, and management ownership. *The Journal of Finance, 51*(4), 1227-1246.

Massa, M., Rehman, Z., & Vermaelen, T. (2007). Mimicking repurchases. *Journal of Financial Economics, 84*(3), 624-666.

McCune, J. (2007, Aug). Snapshot: Do share repurchases signal more M&A activity? *American Bankers Association. ABA Banking Journal*, p. 8.

McNally, W. J. (1999). Open market stock repurchase signaling. *Financial Management, 28*(2), 55-67.

McWilliams, A., & Siegel, D. (1997). Event studies in management research: Theoretical and empirical issues. *Academy of Management Journal, 40*(3), 626-657.

Medury, P. V., Bowyer, L., & Srinivasan, V. (1992). Stock repurchases: A multivariate analysis of repurchasing firms. *Quarterly Journal of Business and Economics, 31*(1), 21-44.

Miller, J., & McConnell, J. (1995). Open market share repurchase programs and bid-ask spreads on the NYSE: Implications for corporate payout policy. *Journal of Financial and Quantitative Analysis, 30*(3), 365-382.

Miller, M. H., & Modigliani, F. (1961). Dividend policy, growth, and the valuation of shares. *The Journal of Business, 34*(4), 411-433.

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

Motis, J. (2007, February). *Mergers and acquisitions motives.* Retrieved from Toulouse School of Economics EHESS (GREMAQ) and University of Crete: https://economics.soc.uoc.gr/wpa/docs/paper2mottis.pdf

Motta, M. (2004). *Competition policy: theory and practice.* Cambridge: Cambridge University Press.

Mukherjee, T. K., Kiymaz, H., & Baker, H. (2004). Merger motives and target valuation: A survey of evidence from CFOs. *Journal of Applied Finance, 14*(2).

Müller, S. (2020). *Significance test for event studies*. Retrieved from Event study tools: https://www.eventstudytools.com/significance-tests

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

Nathan, C. M., & Sobel, M. (1980). Corporate stock repurchases in the context of unsolicited takeover bids. *The Business Lawyer, 35*(4), 1545-1566.

Obernberger, S. (2014). The timing of actual share repurchases. *SSRN Electronic Journal*.

Ofer, A. R., & Thakor, A. (1987). A theory of stock price responses to alternative corporate cash disbursement methods: Stock repurchases and dividends. *The Journal of Finance, 42*(2), 365-394.

Oswald, D., & Young, S. (2004). What role taxes and regulation? A second look at open market share buyback activity in the UK. *Journal of Business Finance & Accounting, 31*(1-2), 257-292.

Otchere, I., & Ross, M. (2002). Do share buy back announcements convey firm-specific or industry-wide information? A test of the undervaluation hypothesis. *International Review of Financial Analysis, 11*(4), 511-531.

Patell, J. M. (1976). Corporate forecasts of earnings per share and stock price behavior: Empirical test. *Journal of Accounting Research, 14*(2), 246-276.

Persons, J. C. (1997). Heterogeneous shareholders and signaling with share repurchases. *Journal of Corporate Finance, 3*(3), 221-249.

Peyer, U. C., & Vermaelen, T. (2005). The many facets of privately negotiated stock repurchases. *Journal of Financial Economics, 75*(2), 361-395.

Peyer, U. C., & Vermaelen, T. (2009). The nature and persistence of buyback anomalies. *The Review of Financial Studies, 22*(4), 1693-1745.

Porter, M. E. (1991). Capital disadvantage: America's failing capital investment systems. *Harvard Business Review, 70*(5), 65-82.

PRNewswire. (2020, March 24). *S&P 500 buybacks up 3.2% in Q4 2019; Full Year 2019 down 9.6% from record 2018, as companies brace for a more volatile 2020*. Retrieved from PR Newswire: https://www.prnewswire.com/news-releases/sp-500-buybacks-up-3-2-in-q4-2019-full-year-2019-down-9-6-from-record-2018--as-companies-brace-for-a-more-volatile-2020--301028874.html

Rau, P. R., & Vermaelen, T. (2002). Regulation, taxes, and share repurchases in the United Kingdom. *The Journal of Business, 75*(2), 245-282.

Rees, W. (1996). The impact of open market equity repurchases on UK equity prices. *The European Journal of Finance, 2*(4), 353-370.

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

Roll, R. (1981). A possible explanation of the small firm effect. *The Journal of Finance, 36*(4), 879-888.

Roll, R. (1986). The hubris hypothesis of corporate takeovers. *Journal of Business, 59*(2), 197-216.

Rye, B. (2019, September 25). *Are Share Buy-Backs Impending M&A Activity?* Retrieved from Daily Oil Bulletin: https://www.dailyoilbulletin.com/article/2019/9/25/are-share-buy-backs-impeding-ma-activity/

Schremper, R. (2002). Informationseffizienz des Kapitalmarkts. *WiSt-Wirtschaftswissenschaftliches Studium, 31*(12), 687-692.

Schultz, P. (2003). Pseudo market timing and the long-run underperformance of ipos. *Journal of Finance, 58*(2), 483-517.

Seifert, U., & Stehle, R. (2003). *Stock performance around share repurchase announcements in Germany (*Humboldt University Berlin Working Paper 373). https://edoc.hu-berlin.de/handle/18452/4304

Shleifer, A., & Vishny, R. (1989). Management entrenchment: The case of manager-specific investments. *Journal of Financial Economics, 25*(1), 123-139.

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

Singh, A. K., Zaman, M., & Krishnamurti, C. (1994). Liquidity changes associated with open market repurchases. *Financial Management, 23*(1), 47-55.

Sinha, S. (1991). Share repurchase as a takeover defense. *Journal of Financial and Quantitative Analysis, 26*(2), 233-244.

Skinner, D. J. (2008). The evolving relation between earnings, dividends, and stock repurchases. *Journal of Financial Economics, 87*(3), 582-609.

Skjeltorp, J. A. (2004). *The market impact and timing of open market share repurchases in Norway.* Norges Bank.

Stephens, C. P., & Weisbach, M. (1998). Actual share reacquisitions in open-market repurchase programs. *The Journal of Finance, 53*(1), 313-333.

Stowe, J. D., McLeavey, D. W., & Pinto, J. E. (2009). Share repurchases and stock valuation models. *The Journal of Portfolio Management, 35*(4), 170-179.

Swieringa, J., & Schauten, M. (2007). *The payment method choice on Dutch mergers and acquisitions* (SSRN Working Paper No 1018899). http://dx.doi.org/10.2139/ssrn.1018899

Trautwein, F. (1990). Merger motives and merger prescriptions. *Strategic Management Journal, 11*(4), 283-295.

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

Tsetsekos, G. P., Kaufman, D., & Gitman, L. (2011). A survey of stock repurchase motivations and practices of major U.S. corporations. *Journal of Applied Business Research, 7*(3), 15-21.

Turco, E. M. (2018, September 26). *Are stock buybacks crowding out real investment? Empirical evidence from US firms*. Retrieved from https://www.boeckler.de/pdf/v_2018_10_27_turco.pdf

Varaiya, N. P., & Ferris, K. (1987). Overpaying in corporate takeovers: The winner's curse. *Financial Analysts Journal, 43*(3), 64-70.

Vermaelen, T. (1981). Common stock repurchases and market signalling: An empirical study. *Journal of Financial Economics, 9*(2), 139-183.

Vermaelen, T. (2005). Share repurchases. *Foundations and Trends in Finance, 1*(3), 171-268.

Walkling, R. A., & Edmister, R. (1985). Determinants of tender offer premiums. *Financial Analysts Journal, 41*(1), 27-37.

Wiggins, J. B. (1994). Open market stock repurchase programs and liquidity. *Journal of Financial Research, 17*(2), 217-229.

Wilber, R. S. (2007). Why do firms repurchase stock to acquire another firm? *Review of Quantitative Finance and Accounting, 29*(2), 155-172.

Yook, K. C., & Gangopadhyay, P. (2011). A comprehensive examination of the wealth effects of recent stock repurchase announcements. *Review of Quantitative Finance and Accounting, 37*(4), 509-529.

Zhang, H. (2002). Share repurchases under the commercial law 212-2 in Japan: Market reaction and actual implementation. *Pacific-Basin Finance Journal, 10*(3), 287-305.

Zhang, H. (2005). Share price performance following actual share repurchases. *Journal of Banking & Finance, 29*(7), 1887-1901.

Zhang, P. (2001). *What really determines the payment methods in M&A deals (*Manchester School of Management Working Paper No 2001-0103). http://dx.doi.org/10.2139/ssrn.284770

Appendix

Table AI: Share Repurchase Announcement Sample Construction

This table outlines the criteria that are followed to establish the final dataset of 2,789 share repurchase announcements that are announced by 1,428 different firms between January 1, 2010 and December 31, 2016.

Sample construction	Number of announcements excluded	Number of announcements remaining
Open market share repurchase announcements announced by U.S.publicly listed firms between 1-1-2010 and 31-12-2016		4,370
Remove share repurchase announcements without disclosed share repurchase values	40	4,330
Remove share repurchase announcements at which firm seeks more than 25% of the number of shares outstanding	57	4,273
Remove share repurchase announcements at which share repurchase value is below 1 million U.S. Dollars	87	4,186
Remove share repurchase announcements of firms without containing SIC codes	4	4,182
Remove share repurchase announcements of firms with stocks trading below 3 U.S. Dollar a week before the announcement	178	4,004
Remove share repurchase announcements which firms announced within 30 days after another repurchase announcement	94	3,910
Remove share repurchase announcements at which daily stock returns, trading volumes and market capitalisations are not available	717	3,193
Remove share repurchase announcements without quarterly accounting data such as firm size, market-to-book, cash and leverage	404	2,789

Table AII: Share Repurchase Announcements per Industry

This table summarises the share repurchase announcement statistics per division between January 1, 2010 and December 31, 2016. Companies are classified based on their SIC code provided by Thomson One Banker, which results in eight different division groups.

Industry	SIC code	Number of announcements	Total buyback value sought (in USD bn)	Average buyback value sought (in USD bn)
Agriculture, Forestry & Fishing	0100-0999	5	0.7	0.1
Mining & Construction	1000-1799	72	25.6	0.4
Manufacturing	2000-3999	978	1,416.2	1.4
Transportation, Communications & Utilities	4000-4999	141	198.0	1.4
Wholesale & Retail Trade	5000-5999	414	450.4	1.1
Finance, Insurance & Real Estate	6000-6999	652	411.3	0.6
Services	7000-8999	527	357.8	0.7
Public Administration	9100-9729	0	0	0.0

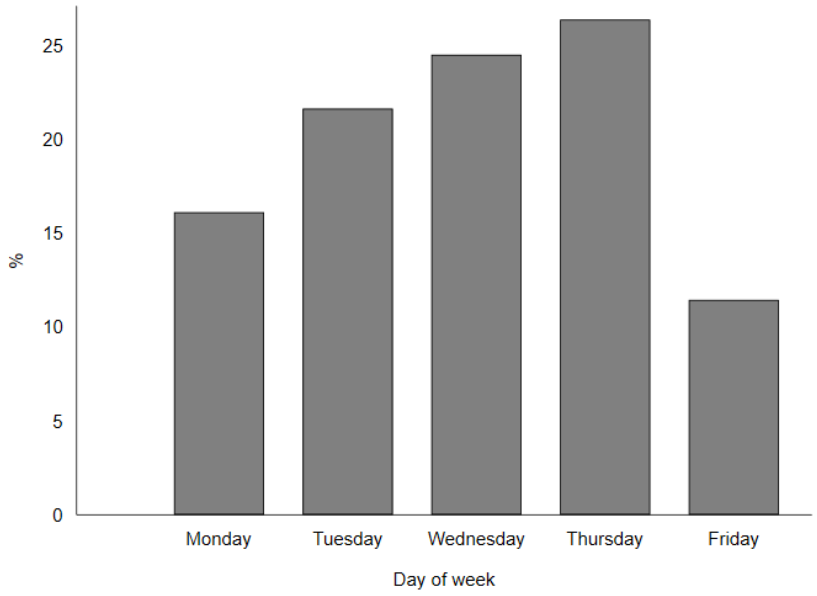

Figure AI: Share Repurchase Announcement Distribution over Trading Days

This figure displays the distribution of share repurchase announcements over trading days. In this research, share repurchases are not announced on Saturday or Sunday.

Table AIII: M&A Announcement Sample Construction

This table outlines the criteria that are followed to establish the final dataset of 1,358 M&A announcements that are announced between January 1, 2010 and December 31, 2017 by 680 unique firms that announced share repurchases between January 1, 2010 and December 31, 2016.

Sample construction	Number of announcements excluded	Number of announcements remaining
All M&A announcements excluding acquisition look-a-likes announced by U.S. publicly listed firms targeting U.S. public, private or subsidiary firms between 1-1-2010 and 31-12-2017		8,808
Remove M&A announcements without disclosed deal values	1	8,807
Remove M&A announcements when bidding or target firm does not contain a SIC code	38	8,769
Remove M&A announcements without the disclosed number of bidders	0	8,769
Remove M&A announcements of public target firms without disclosed acquisition premiums	128	8,641
Remove M&A announcements with a deal value below $1 million	412	8,229
Remove M&A announcements without disclosed payment methods	3,485	4,744
Remove M&A announcements which are announced within 30 days after another M&A announcement	134	4,610
Remove M&A announcements announced by non-repurchasing firms	3,018	1,592
Remove M&A announcements without quarterly accounting data such as firm size, market-to-book, cash and leverage	234	1,358

Table AIV: M&A Announcements per Industry

This table summarises the M&A announcement statistics per division between January 1, 2010 and December 31, 2017. Companies are classified based on their SIC code provided by Thomson One Banker, which results in eight different division groups.

Industry	SIC code	Number of announcements	Total deal value announced (in USD bn)	Average deal value announced (in USD bn)
Agriculture, Forestry & Fishing	0100-0999	2	0.2	0.1
Mining & Construction	1000-1799	39	23.8	0.6
Manufacturing	2000-3999	575	797.3	1.4
Transportation, Communications & Utilities	4000-4999	85	307.0	3.6
Wholesale & Retail Trade	5000-5999	85	139.3	1.6
Finance, Insurance & Real Estate	6000-6999	263	137.4	0.5
Services	7000-8999	309	177.6	0.6
Public Administration	9100-9729	0	0.0	0

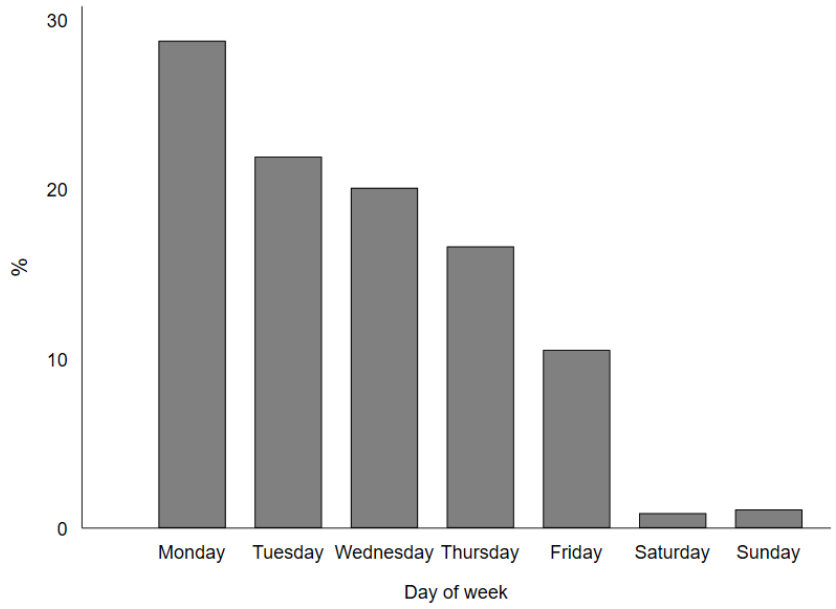

Figure AII: M&A Announcement Distribution over Weekdays

This figure displays the distribution of M&A announcements over weekdays.

Table AV: Variable Definitions

The table outlines an overview of all used variables of this research, which includes stock buyback announcement, M&A announcement and accounting variables. Furthermore, the definition of each variable is documented, the database where the variable is from retrieved and the unit in which the variable is denominated. All variables used for Hypotheses 1 to 4 retrieved from Compustat are measured at the fiscal quarter-end before the share repurchase launching. All variables used for Hypotheses 5 to 8 retrieved from Compustat are measured at the fiscal quarter-end before the M&A launching.

Name	Definition	Source	Unit
Acquirer	Binary variable, equal to 1 if a company announces an M&A transaction between January 1, 2010 and December 31, 2017.	Thomson One	Binary
Announcement	Binary variable, equal to 1 if a company announced a share repurchase within one year before an M&A announcement	Thomson One	Binary
AR	Abnormal return	CRSP	Unit
Bidders	Number of bidders that were involved during the M&A deal process	Thomson One	Unit
Buyback value	Value of shares a company has announced to buy back / Company's market capitalisation	Thomson One	Ratio
Cash	Cash + short-term investments / Total assets	Compustat	Ratio
Cashbid	Binary variable, equal to 1 if the announced payment method for the M&A deal contains at least 80% cash	Thomson One	Binary
Cash payment	The announced percentage of cash as payment method to pay the acquisition	Thomson one	Unit
CAR	Cumulative abnormal return	CRSP	Unit
Deal size	Announced acquisition value paid for a target firm	Thomson One	Million
Firm size	Natural logarithm of a company's total assets	Compustat	Ratio
Industry	Grouping variable based on SIC code	Thomson One	Categorical
Leverage	Long-term debt / Total assets	Compustat	Ratio
Liquidity	Daily trading volume / Number of shares outstanding	CRSP	Ratio
Market-to-book	Market capitalisation / Book value equity	Compustat	Ratio
Monday	Binary variable, equal to 1 if the M&A transaction was announced on Monday	Thomson One	Binary
Premium	Calculated as the offer price for a public target's share compared to the share price of the public target four weeks before the M&A announcement	Thomson One	%
Public	Binary variable, equal to 1 if the target is a publicly listed company	Thomson One	Binary
Related	Binary variable, equal to 1 if the first three digits of the SIC codes of the bidder and target match	Thomson One	Binary
Repurchase size	Value of shares a company has announced to buy back / Company's market capitalisation when a company announces a share repurchase within one year before the M&A announcement	Thomson One/CRSP	Ratio
SIC	Standard Industry Classification code	Thomson One	Categorical
Share price	The closing price of a share on the open market	CRSP	Unit
Stock	Binary variable, equal to 1 if the announced payment method for the M&A deal contains at least 20% stock	Thomson One	Binary
Stock payment	The announced percentage of stock as payment method to pay the acquisition	Thomson one	Unit
Year	Calendar year	Thomson One	Unit

Table AVI: Pearson's Correlation Matrix

This table provides the correlation matrix showing the correlation of all used variables of the regressions. Panel A provides the correlations for the dataset used to examine Hypotheses 1 to 3, using daily observations for all firms that launched a stock buyback during January 1, 2010 and December 31, 2016. Variables are measured at the moment of the buyback announcement. Panel B provides the correlations for the dataset used to examine Hypothesis 4, using monthly observations during 2010 and 2017 for all firms that announced a stock buyback between January 1, 2010 and December 31, 2016. Variables are measured at the moment of the buyback announcement. Panel C provides the correlations for the dataset used to examine Hypotheses 5 to 8, using monthly observations for all firms that announced a stock buyback between January 1, 2010 and December 31, 2016 and announced an M&A transaction between January 1, 2010 and December 31, 2017. Variables are measured at the moment of the M&A announcement. *CAR(0,+2)* represents the cumulative excess return between day t=0 to t=2, where t=0 is the day of the buyback announcement. *CAR(+2, +10)* is the cumulative excess return between day t=2 to t=10, where t=0 is the day of the buyback announcement. *Cash* is the sum of cash and short-term investments to total assets ratio. *Firm size* is the natural logarithm of total assets. *Leverage* is the long-term debt to total assets ratio. *Liquidity* is the daily stock trading volume to number of shares outstanding. *Market-to-book* is the market capitalisation scaled by book value. *Repurchase size* is the announced buyback value as the reduction of market value when an M&A transaction is launched within one year following a buyback announcement. *Acquirer* is a binary variable that equals 1 when a company announces an M&A deal between 2010 and 2017 and equals 0 otherwise. *Announcement* is a binary variable that is equal to 1 for companies that launched an M&A deal within one year after a buyback launching and equals 0 otherwise. *Bidders* represents the number of firms bidding to acquire the same target. *Cash bid* represents a binary variable that equals 1 when the launched payment method includes at least 80% cash financing and equals 0 otherwise. *Deal size* is the announced M&A value in USD millions. *Monday* is a binary variable that equals 1 when the deal is launched on Monday and 0 otherwise. *Premium* represents the announced bid premium and is the offered price for the target's share as a percentage of the target's share price four weeks before the M&A announcement. *Public* is a binary variable that equals 1 for publicly listed target firms and 0 otherwise. *Related* is a binary variable that equals 1 when the first three digits of the SIC codes of the acquirer and bidder matches and equals 0 otherwise. *Stock* represents a binary variable that equals 1 when the launched payment method contains at least 20% stock financing and equals 0 otherwise. *Market-to-book, Repurchase size* and *Deal value* are winsorized at the 1% level.

Panel A: Variables of firms that announced share repurchases using daily data (Hypotheses 1 to 3)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) CAR(0, +2)	1.000							
(2) CAR(+2, +10)	0.123	1.000						
(3) Cash	0.010	0.015	1.000					
(4) Firm size	-0.076	-0.077	-0.283	1.000				
(5) Leverage	-0.025	0.012	-0.265	0.185	1.000			
(6) Liquidity	-0.041	0.041	0.069	0.011	0.046	1.000		
(7) Market-to-book	0.002	-0.042	0.090	0.025	0.042	0.055	1.000	
(8) Repurchase size	0.048	0.062	0.030	0.020	0.069	0.099	0.028	1.000

Panel B: Variables of firms that announced share repurchases using monthly data (Hypothesis 4)

	(1)	(2)	(3)	(4)	(5)	(6)
(1) Acquirer	1.000					
(2) Announcement	0.013	1.000				
(3) Cash	-0.003	-0.011	1.000			

(4) Firm size	0.024	0.088	-0.314	1.000		
(5) Leverage	0.005	-0.003	-0.277	0.204	1.000	
(6) Market-to-book	0.007	0.008	0.126	0.036	0.034	1.000

Panel C: Variables of firms that announced share repurchases and M&A transactions (Hypotheses 5 to 8)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
(1) Bidders	1.000												
(2) Cash	0.148	1.000											
(3) Cash bid	0.038	0.209	1.000										
(4) Deal size	0.060	-0.001	-0.088	1.000									
(5) Firm size	-0.062	-0.228	0.069	0.448	1.000								
(6) Leverage	0.063	-0.130	0.129	0.139	0.155	1.000							
(7) Market-to-book	0.028	0.042	0.108	0.220	0.150	0.445	1.000						
(8) Monday	0.087	-0.090	-0.004	0.186	0.195	-0.068	-0.049	1.000					
(9) Premium	0.140	0.013	0.046	-0.006	-0.017	-0.097	0.101	0.000	1.000				
(10) Public	0.027	0.036	0.121	0.031	-0.108	0.052	0.055	0.055	-0.019	1.000			
(11) Related	0.067	-0.034	-0.071	0.152	0.108	-0.022	-0.047	0.170	0.071	-0.076	1.000		
(12) Repurchase size	0.204	0.207	0.079	-0.112	-0.188	0.041	0.102	-0.133	0.083	-0.013	0.047	1.000	
(13) Stock	-0.013	-0.218	-0.913	0.031	-0.141	-0.135	-0.085	0.018	-0.051	-0.133	0.071	-0.087	1.000

Table AVII: VIF Tests

This table provides the results of all VIF tests performed for all regressions used in this research.

VIF test Hypothesis 3: CAR regression (0, +2)

Variable	VIF	1/VIF
Firm size	1.17	0.85
Market-to-book	1.11	0.90
Cash	1.11	0.90
Repurchase size	1.02	0.98
Leverage	1.02	0.98
Liquidity	1.02	0.98
Mean VIF	1.07	

CAR regression (+2, +10)

Variable	VIF	1/VIF
Firm size	1.17	0.85
Market-to-book	1.11	0.90
Cash	1.11	0.90
Repurchase size	1.02	0.98
Leverage	1.02	0.98
Liquidity	1.02	0.98
Mean VIF	1.07	

VIF test Hypothesis 4

Variable	VIF	1/VIF
Announcement	1.2	0.83
Firm size	1.14	0.88
Market-to-book	1.11	0.90
Cash	1.03	0.97
Leverage	1.01	0.99
Mean VIF	1.10	

VIF test Hypothesis 5

Variable	VIF	1/VIF
Announcement	1.36	0.74
Firm size	1.25	0.80
Deal size	1.22	0.82
Market-to-book	1.14	0.88
Cash	1.14	0.88
Leverage	1.05	0.95
Public	1.03	0.97
Monday	1.01	0.99
Mean VIF	1.15	

VIF test Hypothesis 6

Variable	VIF	1/VIF
Repurchase size	1.29	0.78
Firm size	1.26	0.79
Deal size	1.15	0.87
Market-to-book	1.14	0.88
Cash	1.10	0.91
Leverage	1.06	0.94
Public	1.04	0.96
Monday	1.03	0.97
Mean VIF	1.13	

VIF test Hypothesis 7

Variable	VIF	1/VIF
Announcement	1.81	0.55
Stock	1.93	0.52
Announcement*Stock	1.994	0.50
Firm size	1.66	0.60
Deal size	1.6	0.63
Market-to-book	1.18	0.85
Cash	1.48	0.68
Leverage	1.8	0.56
Bidders	1.06	0.94
Related	1.07	0.93
Mean VIF	1.56	

VIF test Hypothesis 8

Variable	VIF	1/VIF
Repurchase size	1.37	0.73
Stock	4.84	0.21
Repurchase size*Stock	4.37	0.23
Firm size	1.71	0.58
Deal size	1.57	0.64
Market-to-book	1.46	0.68
Cash	1.75	0.57
Leverage	2.12	0.47
Bidders	1.16	0.86
Related	1.18	0.85
Mean VIF	2.15	

Table AVIII: Short-Term ARs and CARs Surrounding Share Repurchase Announcements (VW Index)

This table provides the daily abnormal returns (AR), the corresponding *t*-values and the cumulative abnormal returns (CAR) of 21 days surrounding a buyback launching. The returns are computed by performing an event study in combination with the market model. The time window starts ten business days before the repurchase announcement, (-10) and ends ten business days after the repurchase announcement, (+10). The estimation window ranges from day -261 to day -11. This event study used the CRSP value-weighted index. The dataset contains 2,789 open market buyback announcements of 1,428 U.S. publicly listed firms between 2010 and 2016. Significance at the 10%*, 5%** and 1%*** level, respectively.

Day	AR (%)	*t*-value	CAR (%)
-10	-0.080**	-2.08	-0.080
-9	-0.013	0.39	-0.096
-8	-0.076**	-2.03	-0.169
-7	-0.031	-0.84	-0.198
-6	-0.082**	-2.06	-0.284
-5	-0.060	-1.58	-0.339
-4	-0.071*	-1.81	-0.421
-3	-0.069*	-1.81	-0.490
-2	-0.094**	-2.21	-0.576
-1	-0.093**	-1.97	-0.669
0	0.667***	9.66	-0.006
1	0.598***	7.36	0.593
2	0.109***	2.72	0.702
3	0.102**	2.52	0.804
4	0.102***	2.99	0.909
5	0.069**	2.07	0.978
6	0.100***	3.00	1.079
7	0.065**	2.12	1.144
8	0.088***	2.77	1.232
9	0.046	1.44	1.276
10	-0.023	-0.75	1.254

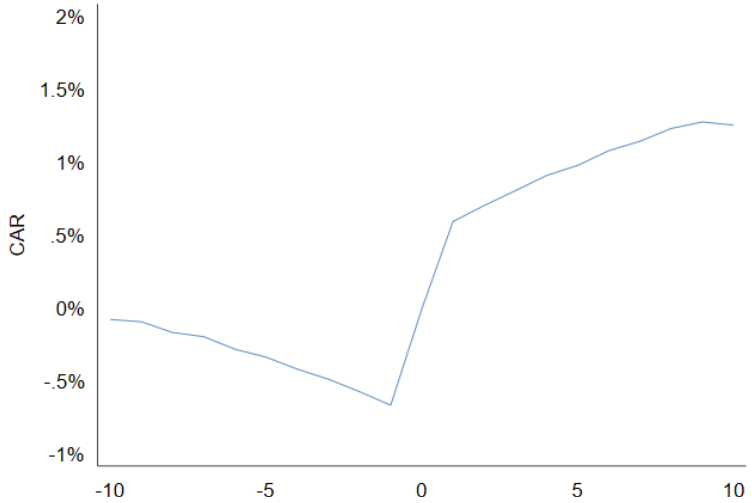

Figure AIII: Short-Term CARs During the Event Window (VW Index)

This figure illustrates the development of the CARs in the 21 business days around a stock buyback announcement of time window (-10, +10). T = 0 is the day of the stock buyback announcement. The CRSP value-weighted index is used.

Table AIX: OLS Regression Results of Short-Term CARs (VW Index)

This table outlines the ordinary least squares regression outcomes for the cumulative abnormal return (CAR) after buyback launchings. *CAR(0, +2)* represents the CAR between day t=0 to t=2, where t=0 is the day of the buyback launching. *Mining* is the sector Mining & Construction, *Manufacturing* is the sector Manufacturing, *Transportation* is the sector Transportation, Communications & Utilities, *Trade* is the sector Wholesale & Retail Trade, *Finance* is the sector Finance, Insurance & Real Estate and *Services* is the sector Services. Public Administration and Agriculture, Forestry & Fishing are excluded, since they together announced 2 M&A deals. *Firm size* is the natural logarithm of total assets. *Market-to-book* is the market capitalisation scaled by book value. *Cash* is the sum of cash and short-term investments to total assets ratio. *Buyback value* is the launched buyback value as the reduction of market value. *Leverage* is the long-term debt to total assets ratio. *Liquidity* is the daily stock trading volume to the number of shares outstanding. *Year FE* controls for fixed year effects.

	(1)	(2)	(3)	(4)	(5)	(6)
	CAR(0, +2)	CAR(0, +2)	CAR(0, +2)	CAR(0, +2)	CAR(0, +2)	CAR(0, +2)
Mining	-0.023	-0.026	-0.026	-0.026	-0.026	-0.023
	(-0.99)	(-1.19)	(-1.16)	(-1.17)	(-1.18)	(-0.98)
Manufacturing	-0.034	-0.037*	-0.037*	-0.037*	-0.037*	-0.034
	(-1.54)	(-1.80)	(-1.77)	(-1.76)	(-1.78)	(-1.51)
Transportation	-0.035	-0.040*	-0.040*	-0.040*	-0.040*	-0.035
	(-1.55)	(-1.90)	(-1.84)	(-1.89)	(-1.89)	(-1.53)
Trade	-0.037*	-0.041*	-0.040*	-0.040*	-0.041*	-0.036
	(-1.67)	(-1.95)	(-1.92)	(-1.89)	(-1.94)	(-1.61)
Finance	-0.031	-0.037*	-0.038*	-0.038*	-0.037*	-0.033
	(-1.42)	(-1.80)	(-1.81)	(-1.82)	(-1.79)	(-1.45)
Services	-0.039*	-0.041**	-0.041*	-0.041*	-0.040*	-0.038*
	(-1.75)	(-1.96)	(-1.92)	(-1.92)	(-1.94)	(-1.70)
Firm size	-0.003***					-0.003***
	(-4.32)					(-4.34)
Market-to-book	0.000					0.000
	(0.57)					(0.67)
Cash		0.003				-0.005
		(0.32)				(-0.46)
Buyback value	0.030***	0.028**	0.029**	0.030***		0.032***
	(2.64)	(2.46)	(2.55)	(2.59)		(2.79)
Leverage			-0.009			-0.005
			(-1.35)			(-0.71)
Liquidity				-0.114		-0.104
				(-0.84)		(-0.76)
Constant	0.065***	0.049**	0.051**	0.051**	0.049**	0.067***
	(2.93)	(2.36)	(2.42)	(2.42)	(2.37)	(2.98)
Observations	2,787	2,787	2,787	2,787	2,787	2,787
R^2	0.012	0.006	0.006	0.008	0.005	0.014
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

T-statistics are presented in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Table AX: Probit Regression Results of M&A Timing (Deal Value > $10 mln)

This table outlines the panel data Probit regression outcomes for M&A activities with a value above 10 million USD of firms after announcing stock buybacks. Acquirer is a binary variable that equals 1 when a company announces an M&A deal between January 1, 2010 and December 31, 2017 and equals 0 otherwise. Announcement is a binary variable that is equal to 1 for companies that launched an M&A deal within one year after a buyback launching and equals 0 otherwise. Firm size is the natural logarithm of total assets. Market-to-book is the market capitalisation scaled by book value. Cash is the sum of cash and short-term investments to total assets ratio. Leverage is the long-term debt to total assets ratio. Industry FE and Year FE control for fixed industry and fixed year effects.

	(1)	(2)	(3)	(4)	(5)	(6)
	Acquirer	Acquirer	Acquirer	Acquirer	Acquirer	Acquirer
Announcement	0.051*	0.067**	0.067**	0.066**	0.108***	0.050*
	(1.92)	(2.54)	(2.53)	(2.49)	(3.99)	(1.87)
Firm size	0.078***					0.078***
	(9.73)					(9.07)
Market-to-book		0.006**				0.004
		(2.05)				(1.48)
Cash			-0.161*			0.035
			(-1.72)			(0.34)
Leverage				0.100		-0.044
				(1.41)		(-0.52)
Constant	-3.037***	-2.527***	-2.507***	-2.542***	-2.540***	-3.036***
	(-16.47)	(-19.66)	(-19.58)	(-19.44)	(-18.39)	(-16.25)
# Months	119,274	119,131	119,274	118,236	134,411	118,090
Wald chi²	180.76	68.98	60.98	59.67	64.18	181.22
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Z-statistics are presented in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Table AXI: Probit Regression Results of M&A Payment Method (Deal Value > $10 mln)

This table outlines the Logit regression outcomes for the announced payment method of M&A deals with a value above 10 million USD of firms that also announced share repurchases. *Stock* represents a binary variable that equals 1 when the launched payment method contains at least 20% stock financing and equals 0 otherwise. *Cash* represents a binary variable that equals 1 when the launched payment method contains at least 80% cash financing and equals 0 otherwise. *Announcement* is a binary variable that is equal to 1 for companies that launched an M&A deal within one year after a buyback launching and equals 0 otherwise. *Repurchase size* is the announced buyback value as the reduction of market value when the M&A deal is announced within one year after the buyback announcement. *Firm size* is the natural logarithm of total assets. *Deal size* is the announced M&A value in USD millions. *Market-to-book* is the market capitalisation scaled by book value. *Cash* is the sum of cash and short-investments to total assets ratio. *Leverage* is the long-term debt to total assets ratio. *Public* is a binary variable that equals 1 for publicly listed target firms and 0 otherwise. *Monday* is a binary variable that equals 1 when the deal is launched on Monday and 0 otherwise. *Industry FE* and *Year FE* control for fixed industry and fixed year effects.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Stock	Stock	Stock	Stock	Cash	Cash	Cash	Cash
Announcement	-0.270***	-0.253**			0.228***	0.174**		
	(-2.87)	(-2.48)			(2.62)	(1.88)		
Repurchase size			-1.674	-0.646			1.369**	0.553
			(-1.26)	(-0.43)			(1.31)	(0.51)
Firm size		-0.157***		-0.211***		0.173***		0.173***
		(-4.74)		(-3.02)		(5.61)		(3.14)
Deal size		0.0001***		0.0001***		-0.0001***		-0.0001***
		(5.48)		(3.81)		(-5.68)		(-3.65)
Market-to-book		-0.013		0.020		0.025*		0.005
		(-0.86)		(0.81)		(1.89)		(0.22)
Cash		-0.355		-1.632**		0.364		1.228**
		(-1.06)		(-2.11)		(1.20)		(1.96)
Leverage		-0.938***		-0.659		0.956***		0.582
		(-3.31)		(-1.30)		(3.75)		(1.24)
Public		0.797***		0.363*		-0.540***		-0.211
		(7.75)		(1.89)		(-5.68)		(-1.25)
Monday		0.007		-0.139		-0.016		0.205
		(0.07)		(-0.78)		(-0.18)		(1.21)
Constant	-1.074***	0.071	-1.915***	-0.155	0.001	-1.217	1.109***	-0.469
	(-7.25)	(0.24)	(-3.35)	(-0.19)	(0.00)	(-1.47)	(3.38)	(-0.83)
Observations	1,270	1,270	378	378	1,272	1,272	384	384
Pseudo R^2	0.152	0.262	0.185	0.277	0.092	0.184	0.083	0.150
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Z-statistics are presented in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Table AXII: OLS Regression Results of M&A Bid Premium (Deal Value > $10 mln)

This table outlines the ordinary least squares regression outcomes for the announced bid premium of M&A deals M&A deals with a value above 10 million USD of firms that also announced buybacks. *Premium* represents the announced bid premium and is the offered price for the target's share as a percentage of the target's share price four weeks before the M&A announcement. *Announcement* is a binary variable that is equal to 1 for companies that launched an M&A deal within one year after a buyback launching and equals 0 otherwise. *Repurchase size* is the announced buyback value as the reduction of market value when the M&A deal is announced within one year after the buyback announcement. *Stock* represents a binary variable that equals 1 when the launched payment method contains at least 20% stock financing and equals 0 otherwise. *Announcement*Stock* is the interaction between *Announcement* and *Stock*. *Repurchase size*Stock* is the interaction between *Repurchase size* and *Stock*. *Firm size* is the natural logarithm of total assets. *Deal size* is the announced M&A value in USD millions. *Market-to-book* is the market capitalisation scaled by book value. *Cash* is the sum of cash and short-investments to total assets ratio. *Leverage* is the long-term debt to total assets ratio. *Bidders* represents the number of firms bidding to acquire the same target. *Related* is a binary variable that equals 1 when the first three digits of the SIC codes of the acquirer and bidder matches and equals 0 otherwise. *Industry FE* and *Year FE* control for fixed industry and fixed year effects.

	(1)	(2)	(3)	(4)
	Premium	Premium	Premium	Premium
Announcement	3.851	0.542		
	(0.86)	(0.09)		
Repurchase size			57.726	36.443
			(1.31)	(0.64)
Stock		1.758		6.315
		(0.26)		(0.50)
Announcement*Stock		-1.120		
		(-0.12)		
Repurchase size*Stock				-220.461
				(-1.36)
Firm size		4.323*		-1.884
		(1.73)		(-0.83)
Deal size		-0.001**		0.000
		(-2.08)		(0.14)
Market-to-book		1.301**		2.063***
		(2.51)		(2.74)
Cash		1.014		-23.583
		(0.06)		(-0.89)
Leverage		-6.206		-29.210
		(-0.44)		(-1.12)
Bidders		24.506*		19.222
		(1.81)		(1.40)
Related		7.857*		5.608
		(1.85)		(0.90)
Constant	48.174***	-21.923	69.536***	70.271**
	(4.67)	(-0.61)	(3.91)	(2.20)
Observations	367	367	122	122
R^2	0.039	0.109	0.113	0.191
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes

T-statistics are presented in parentheses
* p<0.1, ** p<0.05, *** p<0.01

Table AXIII: Logit Regression Results of M&A Timing

This table outlines the panel data Logit regression outcomes for M&A activities of firms after announcing stock buybacks. *Acquirer* is a binary variable that equals 1 when a company announces an M&A deal between January 1, 2010 and December 31, 2017 and equals 0 otherwise. *Announcement* is a binary variable that is equal to 1 for companies that launched an M&A deal within one year after a buyback launching and equals 0 otherwise. *Firm size* is the natural logarithm of total assets. *Market-to-book* is the market capitalisation scaled by book value. *Cash* is the sum of cash and short-term investments to total assets ratio. *Leverage* is the long-term debt to total assets ratio. *Industry FE* and *Year FE* control for fixed industry and fixed year effects.

	(1)	(2)	(3)	(4)	(5)	(6)
	Acquirer	Acquirer	Acquirer	Acquirer	Acquirer	Acquirer
Announcement	0.106*	0.137**	0.136**	0.133**	0.235***	0.101
	(1.66)	(2.13)	(2.12)	(2.07)	(3.58)	(1.57)
Firm size	0.153***					0.159***
	(7.41)					(7.17)
Market-to-book		0.016**				0.012*
		(2.19)				(1.72)
Cash			-0.169			0.220
			(-0.71)			(0.85)
Leverage				0.095		-0.187
				(0.53)		(-0.87)
Constant	-6.225***	-5.220***	-5.186***	-5.221***	-5.270***	-6.243***
	(-13.67)	(-15.50)	(-15.48)	(-15.43)	(-14.50)	(-13.59)
# Months	119,274	119,131	119,274	118,236	134,411	118,090
Wald chi²	146.66	80.26	68.45	68.07	71.95	154.25
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes

Table AXIV: Logit Regression Results of M&A Payment Method

This table outlines the Logit regression outcomes for the announced payment method of M&A deals of firms that also announced share repurchases. *Stock* represents a binary variable that equals 1 when the launched payment method contains at least 20% stock financing and equals 0 otherwise. *Cash* represents a binary variable that equals 1 when the launched payment method contains at least 80% cash financing and equals 0 otherwise. *Announcement* is a binary variable that is equal to 1 for companies that launched an M&A deal within one year after a buyback launching and equals 0 otherwise. *Repurchase size* is the announced buyback value as the reduction of market value when the M&A deal is announced within one year after the buyback announcement. *Firm size* is the natural logarithm of total assets. *Deal size* is the announced M&A value in USD millions. *Market-to-book* is the market capitalisation scaled by book value. *Cash* is the sum of cash and short-investments to total assets ratio. *Leverage* is the long-term debt to total assets ratio. *Public* is a binary variable that equals 1 for publicly listed target firms and 0 otherwise. *Monday* is a binary variable that equals 1 when the deal is launched on Monday and 0 otherwise. *Industry FE* and *Year FE* control for fixed industry and fixed year effects.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Stock	Stock	Stock	Stock	Cash	Cash	Cash	Cash
Announcement	-0.436***	-0.410**			0.363**	0.280*		
	(-2.67)	(-2.27)			(2.52)	(1.80)		
Repurchase size			-4.328	-3.347			3.186	2.294
			(-1.45)	(-0.93)			(1.49)	(0.94)
Firm size		-0.250***		-0.403***		0.302***		0.347***
		(-4.52)		(-3.16)		(5.97)		(3.49)
Deal size		0.0001***		0.0002***		-0.0002***		-0.0002***
		(4.93)		(3.38)		(-5.00)		(-3.24)
Market-to-book		-0.030		0.037		0.050**		0.012
		(-1.08)		(0.71)		(2.08)		(0.24)
Cash		-0.596		-2.215*		0.626		1.770*
		(-1.02)		(-1.72)		(1.29)		(1.82)
Leverage		-1.761***		-1.242		1.627***		1.013
		(-3.44)		(-1.24)		(3.72)		(1.20)
Public		1.427***		0.679*		-0.906***		-0.336
		(7.88)		(1.93)		(-5.62)		(-1.14)
Monday		0.054		-0.135		-0.051		0.411
		(0.34)		(-0.44)		(-0.36)		(1.44)
Constant	-1.769***	0.0065	-3.469***	-0.111	1.041***	-1.358***	1.779***	-1.342
	(-6.84)	(0.13)	(-2.81)	(-0.07)	(4.94)	(-3.15)	(2.85)	(-1.28)
Observations	1,356	1,356	394	394	1,356	1,356	401	401
Pseudo R^2	0.146	0.251	0.179	0.262	0.085	0.174	0.082	0.147
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Z-statistics are presented in parentheses
* p<0.1, ** p<0.05, *** p<0.01