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Distressed and Bankrupt Targets: Potential Stars or Loss-making Dogs?

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Abstract

The purpose of this study is to empirically investigate the impact of distressed and bankrupt targets on short- and long-term acquirer's performance. The results reveal that distressed public targets have a significant negative impact on the CAR (-1, +1) of the public acquirer firm. Distressed deals cause an approximately 2% lower acquirer's CAR relative to non-distressed firms. Bankrupt public targets, on the other hand, cause a significant positive acquirer's CAR (-1, +1) of 2.97%. In short, bankrupt public target companies are more favorable to acquirer shareholders compared to distressed public target companies. Furthermore, the use of a syndicated loan for a distressed acquisition has a significant positive effect on the acquirer's CAR, establishing that the type of financing affects the stock price. Finally, the long-term effects of public distressed and public bankrupt acquisitions were examined, but no significant effects were found. As a result, it is not possible to determine with certainty how a distressed or bankrupt acquisition affects the long-term performance of the acquiring firm.

Keywords: Corporate Finance, Financially distressed, bankruptcy, M&A, Event Study

JEL Classification: G33, G34.

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1 Introduction

Various sectors, such as the oil & gas industry, have been hit hard by the global pandemic of Covid-19. Due to COVID-19, daily life has changed dramatically. With the uncertainty of the future caused by the pandemic, certain industries have to adapt. The firm PWC noticed that COVID-19 not only affected countless human lives, but also dealt a destructive blow to the global economy, disrupting supply chains and a squeezing demand. The demand for electricity dropped significantly in many areas and the market for transport fuel shrank as planes were grounded and traffic curtailed. This study will focus on the contribution to a deeper understanding of the impact of distressed and bankrupt acquisitions. Irum and Hudgins (2020) showed that there were 610 bankruptcies in the U.S. within the domain of public companies and the private companies with a substantial percentage of public debt in 2020. This is the largest number of bankruptcies since the year 2012. The bankruptcies were mainly centered in the consumer discretionary, industrials and energy sectors. This could be a result of the COVID-19 pandemic since these sectors where hit the hardest. Despite the pandemic, the number of mergers and acquisitions (M&A) deals in the US remains almost the same within the year 2020 compared to the previous year. However, a decrease in deal size is observed, since the average deal size decreasing from $233 million in 2019 to $114 million in 2020 (PricewaterhouseCoopers, 2021). In addition, more companies that are in financial difficulty or bankrupt have been acquired. These observations make it interesting to examine whether this type of acquisition is profitable for the acquirer firms, and in particular for the acquiring company's shareholders. For this study, the research question is as follows:

RQ: '*To what extent are acquiring financially distressed and bankrupt companies valuable to the shareholders of the acquiring company?*'

For this research, a sample is used where the focus will be on public U.S. acquirers and targets from the period 2000-2020. Private targets are also analyzed, but there is less emphasis on this as there is limited financial information available. To examine an acquisition, a short-term event study is used, in which the share price is examined around the announcement day. Many different studies have used the market model with an event study to measure the effects of a distressed or bankrupt acquisition on the acquirer firm's stock price (Clark & Ofek, 1994; Hotckiss & Mooradian, 1998; Ang & Mauck, 2011; Meier & Servaes, 2020). This thesis will use the Fama-French 3-factor model since this model provides a more accurate prediction.

Different studies on distressed acquisitions use several methods to detect distress. To illustrate, Andrade and Kaplan (1998) and Almeida et al. (2011) used the interest coverage ratio (ICR). This ratio measures to what extent a company can pay its interest costs. Furthermore, Johnson and Abbott (1991) and Ang and Mauck (2011) used Altman's (1968) Z-score. This score consists of a number of financial ratios, which analyze the financial health of a company. Since this thesis wants to convey certainty, both

the interest coverage ratio (ICR) method and the Altman's (1968) Z-score are used to measure distress.

The results from previous literature is contradictory when it comes to the effect of distressed deals on the acquirer firm' performance. Clark and Ofek (1994) were among one of the first researchers who focused on distressed deals and found a significant negative effect of -1.40% on the acquirer's CAR. Furthermore, Ang & Mauck (2011) found in their model that a distressed target caused a -1.06% decrease in the Cumulative Abnormal Return (CAR) of the acquirer firm, while Meier & Servaes (2020) found a positive CAR of 3.28%. This thesis will distinguish between distressed public firms and bankrupt public targets. Private distressed targets and private bankrupt targets are also examined to make the study more relevant than it has been in previous studies.

To test the effect of an acquisition on the acquirer's performance, the CAR is used, in which the focus will be on an event window of day -1 to +1. This minimizes external factors that could affect the acquirer firm's stock price. A financially distressed target, is a company that is struggling to stay solid, increasing the risk that the company will enter bankruptcy. This thesis analyses the advantages and disadvantages between the two types. A bankrupt company that is in Chapter 11 enters a process where the company is completely reorganized. This can be an advantage for an acquirer, as the value of the target is clearly observable. Chapter 11 will be explained further in the literature review.

Now, some of the motives for an acquisition of a distressed company are, first of all, that a distressed company can be managed more efficiently, thus creating value. Second, gaining synergies is a rational incentive. When the resources of the target and the acquiring firm are combined, better performance can be achieved than if the firms existed separately (Andrade et al., 2001). Finally, a distressed target can be perceived by the acquirer as a discount deal. Distressed targets need financial resources to pay their obligations and invest in new opportunities. They have much less bargaining power because the need is high and therefore there are fewer potential bidders because of the low attractiveness (Clark & Ofek, 1994). Furthermore, there are also many conflicting findings about bankrupt targets that are in Chapter 11. Amit et al. (1989) show that lower premiums are paid for bankrupt targets, which makes an acquirer firm operate more close to the true value of the target and has a positive impact on the post-acquisition performance of the acquirer's stock price. Studies by Altman (1984), Johnson and Abbott (1991) and Warner (1997) reveal that there are many direct and indirect costs involved with bankruptcies, but these are mainly directed to the bankrupt target through a lower premium price.

There are many factors that can influence the effect of distressed acquisitions. Bruton et al. (1994) found that performance was higher when the target and the acquirer were business-related. This is because an acquirer has more market knowledge and therefore can properly assess the value of the target. This effect is enhanced with a distressed target, as it is then even more difficult to estimate the potential value of a business. The study performed by Bruton et al. (1994) had a sample taken from the years 1979 to 1987, focusing on about 50 companies. They examine whether the effect is the same at a more recent time period and with an event study where more firms are examined, leading to a more

causal result.

Acquiring a distressed target may be cheaper, but it also costs a lot more equity to invest in the target after the acquisition. A distressed target needs slack to pay off its interest and is running out of reserves. The danger can therefore be that an acquiring firm is drawn into a distressed position or even bankruptcy. Johnson and Abott (1991) indicate that an acquirer must be financially strong to be able to provide a distressed target with capital and make it a profitable business. This study examines whether the solvency ratio of an acquirer has a positive effect on the CAR. Financial strength is also tested by the acquirer's profitability and the relative size between the target and acquirer, since an acquirer is less likely to go along for the ride if it is a much larger company relative to the target.

In addition to the characteristics of a target, the method of financing also affects the share price of an acquirer. An acquisition involves large sums of capital, which is why syndicated loans are very popular in this market. A syndicated loan consists of a mix of private and public debt, involving at least two financial institutions (Sufi, 2007). The involvement of several parties means that a considerably larger amount can be borrowed. In the U.S., J.P. Morgan, Bank of America and Citi Group are major participants in syndicated loans. According to Ross (2010), they account for more than 50% of the corporate loan market. One advantage of having more institutional parties in a syndicated loan is that it strengthens due diligence, resulting in lower information asymmetry. In addition, the high reputation of the banks sends a positive signal to the acquirer's shareholders (Ross, 2010). However, collateral is required for bank loans, so companies often choose riskier options, such as private equity firms. As a result, they have to agree on less or even no collateral, allowing more risk to be taken.

Besides the short-run effects of acquisitions, long-run effects are also interesting to investigate. This thesis utilizes the buy-and-hold abnormal return (BHAR) method. This approach has also been used by Rosen (2006), Bouwman et al. (2009) and Ang and Mauck (2011) in their research on mergers and acquisitions. The event window of this long-run study is one year up to two years. Rosen (2006) used a 1-year window and found a BHAR of -6.66% for acquirers firms and Bouwman et al. (2009) used a 2-year window and showed a BHAR of -7.22%. Ang & Maud (2011) focused on distressed deals and did not find a significant effect of the BHAR in their sample.

This research reveals that distressed public targets have a significant negative effect on the public acquirer's CAR (-1, +1). When using the ICR-method, non-distressed firms also have a significant negative effect of -1.13%, only distressed targets provide an even lower CAR of -3.30%. The difference in mean between the groups is significant, so it can be concluded that distressed public deals are less favorable to public acquirer firms than non-distressed public targets. The Z-score method shows less strong differences, but still there is a significant difference between distressed public targets and non-distressed public targets. No evidence was found that business-related distressed acquisitions cause better acquirer performance. In addition, it became clear that if the relative size between the target and the acquirer becomes larger it leads to a significantly more positive CAR, however there was no significant effect discovered for the effect of an acquirer's solvency and profitability on the CAR.

Furthermore, the use of a syndicated loan for a distressed acquisition has a significant positive effect on the acquirer's CAR, thereby establishing that the type of financing affects the stock price.

A contribution to the literature is the examination of the difference in impact between distressed public companies and bankrupt public companies, which is presented in Chapter 11. It is found that bankrupt public targets cause a significant positive acquirer's CAR (-1, +1) of 2.97%. The difference in mean with public distressed targets is 6.27%. This makes clear that a bankrupt public target is beneficial to acquirer shareholders relative to distressed public targets. Bankrupt private targets are not significantly different from non-bankrupt private targets, therefore no results could be drawn from that. Finally, the long-run effects of public distressed and public bankrupt acquisitions were examined, here no significant effects were found. As a result, it cannot be determined with certainty how a distressed or bankrupt acquisition affects the long-term performance of the acquirer firm.

Now, a literature review will be performed. Within this section the theory will be discussed, such as distressed and bankrupt acquisitions, as well as the factors that may affect CAR's performance. This is necessary to answer the research question and finally the hypothesis development is presented in this chapter. The next chapter includes the methodology, which entails what was needed to conduct the research. This chapter includes a description of the variables used and the regressions needed to hypothesize. Chapter 4 discusses the data needed and provides the descriptive statistics. Chapter 5 presents the results found in the samples. The thesis finishes with a conclusion, limitations and a some future research improvements and ideas.

2 Literature Review

This chapter starts with a description of mergers and acquisitions, where the emphasis will be on distressed acquisitions. Subsequently, the motives of taking over distressed targets will be discussed and the differences between financially distressed and filing for bankruptcy will be outlined. Then, the literature review will continue with a focus on the post-acquisition performances of distressed acquirers. Finally, the hypotheses are presented, which were established based on previous literature. This ensures that the main research question is examined from multiple perspectives.

2.1 Mergers & Acquisitions

Previous literature has extensively examined mergers & acquisitions. The main reason for participating in M&A, is to achieve synergies. Achieving synergy through an acquisition happens because the value of companies combined is worth more than the companies separately (Andrade et al., 2001). There are a couple ways to achieve synergy. At first, a synergy can be achieved by gaining complementary assets. By acquiring companies that contain valuable resources, which complement the assets of the acquirer, economies of scope and scale can be achieved. Second, synergy can be achieved by an increase in market power. By an acquisition within the same market, competition decreases, allowing the acquirer to charge a higher price, and thus achieve more profit. It does not mean that mergers and acquisitions fully exploit synergies. Homberg et al. (2009) show that industry-, country-, and investor characteristics are factors that influence the achievement of synergies and might lead to an actual success or a failure.

Additionally, there are different types of acquisitions. To start, very well-known is the horizontal takeover. Here the target firm is in the same business line as the acquiring firm, making them pure competitors of each other (Eckbo, 1983). Further, the vertical takeover, this is a common acquisition as well (Eckbo, 1983). Here the target firm can either be the supplier or the consumer of the goods or services. Finally, the conglomerate takeover, this type involves acquiring a company that is not related to the buying side's business.

An important feature of mergers and acquisitions is that they take place in so-called waves. The first wave took place from 1893 to 1904 and this wave was known for its horizontal acquisitions, afterwards many different waves came along, not of interest for this research. Gugler et al. (2012) their study on determinants of merger waves show that the United States is very different in terms of merger policy from, for instance, Europe. They find that it is easier in the US to buy the majority of shares of a target, even if the managers do not agree. Markets for corporate control exists here, and companies are less protected from hostile takeovers (Gugler et al., 2012). This is a valid reason why there is more M&A activity in the United States. Ahern and Harford (2014) show that industry links are very important in causing merger waves in the US from 1986 to 2010. They find that industry merger activity proceeds in waves through customer-supplier links. It is shown that the effects of the wave is stronger, and faster when merger & acquisition activity occurs due to a shock at the supplier-side, compared to

the customer-side. One reason for this is that the network of suppliers is more tightly connected than the network of customers.

Further, there are several explanations for the emergence of waves. First, Shleifer & Vishney (2003) and Rhodes-Kropf & Viswanathan (2004) showed in their research through behavioral models that merger waves occurred due to the managerial timing of the market. If a market is overvalued, this can lead to a flow of acquisitions. Hence, the managers perceive that it is relatively cheap to buy a company with overvalued shares. On the other hand, studies show (Gort, 1969; Mitchell & Mulherin, 1996; Harford, 2005) that waves are created by shocks. These shocks occur in an industry and can cause a complete reorganization. The shocks are divided into three types, namely economic-, technological- and regulatory shock. An economic shock is a change caused by an unexpected event that positively affects the economy, for example, it may be cheaper to buy loan all of a sudden. A technological shock occurs because an innovation has taken place, allowing drastic improvements to take place within an industry. Finally, a regulatory shock is a change within the law, making it easier for companies to be taken over. For example, if a certain industry is no longer protected by the government, this can result in a wave of takeovers by companies seeing opportunity in a market.

Harford (2005) tests both theories and concludes that the market timing argument does not hold for every wave and is therefore less strong. Indeed, there are also waves where firms are generally paid with cash, instead of stocks. According to Gugler et al. (2012), if waves are triggered by changes in the economy, there would be merger activity for both listed and unlisted firms. However, Gugler et al. (2012) conclude that a wave is more likely to occur in public mergers. An economic shock leads to optimism in the equity market and causes overvalued public firms. As a result, there is more merger activity observed with public firms, and this is harmful for shareholders, as it destroys value.

2.2 Firms in financial distress

This section highlights the motives of distressed targets and continues by looking at the intentions of the acquirer firm. Finally, the types of measurements that can be used to identify distress are discussed.

2.2.1 Distressed firms in general

When a company finds itself in financial difficulty, the term ‘financially distressed’ is used. Wruck (1990) examined the causes of financial distress. A company can fall into financial distress due to two main reasons. At first there might be a contraction in the operative income of the industry and secondly, Wruck (1990) finds that the company may perform poorly because it is weakly managed. According to Gilson et al. (1990), financial difficulties exist when cash flow is insufficient to meet debt repayments. Not only they are struggling to pay off their debts, but they may have reached the limit to a possible bank loan. This leads to a limitation of investment opportunities, as they no longer have access to financing (Lemmon et al., 2009), which in turn means that bankruptcy is getting closer and closer as debts will continue to grow as a consequence. In Jensen's (1991) research, it emerged that there are

effective outcomes when a firm is in a distressed situation before it goes bankrupt. Jensen (1991) showed that there are three different alternatives for reorganizing a firm. The alternatives are applicable only through a privately renegotiation with the creditors. First, a firm can liquidate part of its organization. With the income, it can pay off its debts and the company can operate more efficiently. Further, a company can focus on corporate restructuring. Finally, a distressed company has the option to merge with another company or be acquired. The last alternative means that another company can provide the distressed target with financial resources. This allows the company to pay off its debts and become healthy again.

2.2.2 Motives of the distressed target

Gilson et al. (1990) investigated the incentives of reorganizations, it is interesting to know whether the alternatives are more attractive to the distressed company and especially for the shareholders or creditors who will be filing for the bankruptcy. Their research revealed that cumulative stock returns are significantly higher when debts are handled through reorganization, rather than through chapter 11. This shows that on average shareholders have incentives not to declare the company bankrupt and thus avoid the court. Determining if financial distress is remedied effectively through bankruptcy or reorganization depends on two factors, namely the costs and the distribution of cost savings. Johnson and Abbott (1991) show that shareholders of distressed companies save more costs when they are acquired. The cost savings is done via direct and indirect costs of bankruptcy. Direct costs of bankruptcy are administrative costs of filing bankruptcy, such as accounting and legal fees (Warner, 1977). In addition, Altman (1984) examined the indirect costs of bankruptcy. These are mainly lost profits of other parties, such as banks and suppliers, finding it too much of a risk to get in business with the company due to the high perceived probability of bankruptcy. In addition to cost savings, a distressed target may also benefit from tax savings if the business would be acquired. The acquirer could take advantage of the revenue loss of the distressed targets by deducting the losses from the profits. This can result in a significant benefit. However, this is more difficult since stringent regulations prevent this (Johnson & Abbott, 1991).

Furthermore, it is important whether the reorganization of a distressed firm has been successful. The study by Lemmon et al. (2009) revealed that 79% of distressed firms arise successfully from bankruptcy reorganizations. While according to the findings of Hotchkiss (1995) many companies that come out of a Chapter 11 position fall back into the old pattern of poor performance. More than one-third even undergoes a second restructuring. Making it an interesting opportunity for the target shareholders to reorganize, rather than to declare bankruptcy.

2.2.3 Motives of the acquirer firm

There are many risks involved in acquiring a distressed target. Therefore, it is important to know what the motives are for an acquiring company to take over a company in financial difficulty. The first reason is to manage the business in a more efficient way, so creating more value than before the acquisition. If

a poor management does not make good use of its valuable resources, the firm's performance will suffer (Bruton et al., 1994). If the management of an acquirer has devised a suitable strategy for the target to perform, the acquisition may be attractive to the shareholders of both parties (Starbuck et al., 1978). Jensen (1991) agrees with this statement and adds that acquisitions are an important mechanism to increase the efficient redeployment of distressed firm's assets.

Second, achieving synergies is seen as a motivation as well. By combining the assets of a distressed target and the assets of a healthy acquirer, improved performance can be achieved relative to having the companies exist separately (Andrade et al., 2001). The potential synergies can reduce the cost of a distressed target, allowing it to again generate healthy positive cash flows (Anand & Singh, 1997). This makes a distressed target attractive to an acquirer who sees opportunities in a poorly performing business. In addition, distressed firms are slack-poor (Peel & Wilson, 1989). As a result, they cannot run optimally and lose performance in the operations. The reason why a business cannot operate optimally is because it does not have room to invest in capital expenditures opportunities that have a positive net present value (Myers, 1977). As a result, a distressed firm misses out on growth opportunities, making it even more difficult to generate healthy cash flows, and thus ends up in a downward spiral. A slack-rich acquirer firm can achieve financial synergies when it takes over a distressed company and can give the firm a capital injection, allowing it to invest in beneficial investments again.

Another reason for a takeover of a distressed target, is that a distressed acquisition is seen as a discount deal. On the one hand, distressed targets have a high need for financial resources to pay their liabilities. In addition, they have much less bargaining power because of their weak condition and therefore have less potential bidders (Clark & Ofek, 1994). Thus, shareholders are more likely to settle for less, and therefore receive a lower premium. Amit et al. (1989) show that bankrupt-predicted targets achieve lower abnormal returns as they receive a lower premium. The reason for this, according to the authors (1989), is that an acquirer has higher implementation costs with a poorly performing target and greater uncertainty about the target its future cash flows.

Ang & Mauck (2011) showed that during a crisis, firms sell their businesses at a discount because demand falls sharply in certain markets, leaving the firms even less attractive for other companies. On the other hand, the authors (2011) concluded that distressed targets receive a 30% higher offer premium than if a distressed target would receive during a normal situation. A reason for this is that there is more to gain for an acquirer because a target performs especially poorly due to poor management. If the acquirer's management makes good use of the resources, it creates much more value (Clark & Ofek, 1994). However, it is also possible that the discount is overestimated during a crisis period, resulting in the true value being much lower than what was offered.

2.2.4 Measurements of financially distress

In the previous literature, distressed firms have been measured in several ways. Johnson and Abbott (1991) identified financially distressed firms through the Altman's Z-score. It is a method where the data requirements are minimal, and is convenient to apply to targets. If a company's Z-score falls below the value 1.8 for two years prior to the year of the deal, the company is in financial trouble, and is defined as financially distressed. Johnson and Abbott (1991) use a two-year period to extract the probability that a healthy company happens to have a bad year. This method is also used by Haw et al. (1987) and Ang and Mauck (2011), who researched firms with poor performance. Altman's Z-score (1968) consists of financial ratios that collectively provide a comprehensive picture of a company's health.

Clark and Ofek (1994) have provided a good foundation towards the examination of restructuring distressed firms. They have several indications to detect a distressed firm. The first indicator is poor stock performance, however, there are plenty of firms with poor stock performance that are not restructuring. Therefore, Clark and Ofek (1994) used information from the financial press (Wall Street Journal), to make sure that the firms really were in financial trouble. This is an effective way to detect distressed firms, however, it might be too much time consuming to analyze firms through the financial press.

Bruton et al. (1994) used two different measurements in their study of the performance of distressed targets acquisitions. For the measurements, they use two financial ratios. The first one is the net income measurement and the second one is the return on investment (ROI). When measuring net income, annual income is used after tax deduction. In addition, the annual growth of a company is also considered. For the return on investment, the annual income after tax is divided by invested capital. Distressed firms experience prolonged declines in both ratios. Where a period of two years of long declines is the threshold for being distressed. Shorter than two years could mean a coincidence and when longer than two years was measured it could cause distressed targets to fall out of the sample.

Andrade and Kaplan (1998) and Almeida et al. (2011) used the interest coverage ratio to measure financial distress with firms. This ratio shows whether the company is still able to pay its interest. If the firm is no longer able to do so, it has a ratio value less than 1. This indicates that a company is in financial distress. Hence, the ratio is a useful measurement, it is easy to apply as the required financial data is not too complex and accessible.

Finally, another way to measure distress is through the solvency ratio. Brîndescu-Olariu (2016) used this ratio to predict Romanian companies' distress and bankruptcy. He showed that companies who went bankrupt experienced a significantly lower solvency ratio in the years before. The likelihood of distress increases if the company has a ratio below 100%.

2.3 Chapter 11

A company in financial difficulty can reorganize its operations by privately restructuring its debts, or by using the bankruptcy court as a last resort. Gilson et al. (1990) provided a foundation for research on

bankrupt firms. A firm located in Chapter 11 is covered by the U.S. Bankruptcy Code. In Chapter 11, according to Gilson et al. (1990) and Skeel (1992) an exchange of securities is proposed in a so-called reorganization plan. Gilson et al. (1990) show that the company is protected from creditor harassment during their time under Chapter 11. All the while reorganization, creditors cannot claim their debts or collateral until the company has emerged from bankruptcy. The claim holders are placed in different classes, and each class gets its own separate exchange. The value of the new securities is valued based on the absolute priority rule. The senior class receives its claims first and then the junior class has its turn. Later the filing company has the right to propose the first reorganization plan. This plan is accepted if a majority vote is obtained by the claim holders. A majority is achieved by two-thirds in claim value or by one-half in absolute numbers. If the plan is not proposed by the company within 120 days or accepted by the claim holders within 60 additional days, any other claim holder may propose a plan (Gilson et al., 1990; Skeel, 1992).

Amit et al. (1989) show in their study that bankrupt-predicted targets perform worse than non-bankrupt predicted targets. One reason for this is that a bankrupt target wants to do everything that is possible to keep the company alive, making it more dependent on an acquirer. According to Amit et al. (1989), a second cause is that bidders have higher implementation costs and there is greater uncertainty regarding the target's cash flows. As a result, an acquirer would offer a lower premium, causing the target shareholders to receive lower returns (Amit et al., 1989). In addition, Bartunek et al. (1995) assumes that the additional costs involved in a bankrupt target are incorporated into the premium. They assume that a bankrupt target will be paid a lower premium and thus be closer to the true value of the firm. This actually results in a more positive abnormal return after an acquisition. Bartunek et al. (1995) show with their sample of the period 1978-1991 that an acquisition of a bankrupt target has a positive effect on the acquirer’s share price.

Bartunek et al. (1995), additionally give other reasons for a positive result of the acquirer’ performance. Namely, that courts can overcome any opposition that may arise. And acquirers can obtain favorable debt contracts composed by the reorganization process. The additional costs of the Chapter 11 Bankruptcy Code can be offset by the formal reorganization plan. This results in a more comprehensive breakdown of the assets and the debts of the bankrupt target. This decreases the uncertainty of the value of the business, which benefits the acquirer firm. They need to persuade the shareholders to make an offer for a bankrupt company. As the uncertainty decreases regarding the target value, it is easier to justify a premium (Bartunek et al., 1995). In addition to greater certainty of value, there are also potential tax benefits to be gained. Acquirers may still use the bankrupt target previous losses, making a bankrupt target more attractive to an acquirer (Haw et al., 1987).

2.4 Performance

The post-acquisition performance of mergers and acquisitions is an important topic in the literature. In practice, one expects that it would have a positive effect on the performance of the companies, otherwise

there would not be so many mergers and acquisitions. Yet, previous research shows that this is not always the case. As an acquisition is very complex, there are many factors that can affect performance. In existing literature, findings are divided on the performance of an acquirer, especially if the target is distressed.

2.4.1 Short-term performance

A common method of measuring performance after an acquisition is through the Cumulative Abnormal Return (CAR) where the focus of the measurement is on the short term. Table 1 lists key event studies that have examined distressed acquisitions. Johnson and Abbott (1991)) and Meier and Servaes (2020) examined the performance acquirers who acquired a distressed target. The results show that there is a positive relationship with abnormal returns if it was an acquisition and a negative abnormal return if a merger was announced. A reason for this is according to Johnson and Abbott (1991), the financial strength of the acquirer. A merger is riskier than an acquisition, hence it leads to negative abnormal returns. Therefore, the size of the firm is also positive related to performance of the acquirer firm. The larger the firm relative to the distressed target, the more positive the impact becomes on the acquirer firm's performance after the acquisition. In addition, a large company is much more difficult to integrate. Thereby, Al-Sharkas and Hassan (2010) show that there is a negative correlation with the abnormal return of an acquirer firm and the size of target firm.

Bruton et al. (1994) found positive performance as well among acquirers after an acquisition of a distressed target, but distinguished between business related and business unrelated acquisitions. Indeed, they showed that acquirers who made a business-related acquisition performed better than unrelated acquisitions. Since a target is distressed, potential acquirers are more cautious, therefore more time and resources are invested in researching the true value of the target. According to Bruton et al. (1994), a business related acquirer is better able to assess the added value of a target, which makes business unrelated acquirers drop out or make a too low offer. A company that has a related business is more likely to have crucial tacit knowledge about a target and that knowledge ensures success after the acquisition.

These findings are also consistent with the study of Fowler and Schmidt (1989), Servaes (1991) and Jory and Madura (2009) who show that potential synergies are higher when the target and acquirer are in the same industry. One reason is that the companies integrate more smoothly since the acquirer knows the market better than an outsider. This perceived a distressed target to be worth more to a related bidder. In addition to finding more potential synergies, there is less information asymmetry for the bidder. A related firm knows the market better and learned what the dangers and opportunities are. In addition, a related bidder is more likely to have a relationship with a distressed target than an unrelated bidder, which makes the valuation of a related target easier (Hotchkiss & Mooradian, 1998).

Clark and Ofek (1994) also show in their study that an acquisition of a distressed firm is more likely to be an acquirer in the same industry, than an acquisition of a general firm. In contrast, Clark and

Ofek (1994) found negative post-acquisition performance from the acquirer. One possible cause Clark and Ofek (1994) give is a too high premium being paid. The premiums become significantly higher if there is more added value to be gained from combining the operations. However, it turns out that it is difficult to realize the potential added value in practice, which puts pressure on the acquirer's post-acquisition return due to the high premium.

On the contrary, Hotchkiss and Mooradian (1998) find significant positive abnormal returns at the acquirer and distressed target, while with healthy targets no positive abnormal returns were found at the acquirer. A possible explanation for this is that there is less chance of empire-building in a distressed acquisition. Empire-building implies that the manager focuses on increasing his wealth, at the expense of the wealth of the shareholders. Distressed and bankrupt firms involve complex negotiations with creditors, so Hotchkiss and Mooradian (1998) observed fewer bad acquirers in a distressed deal. This was confirmed by Ang and Mauck (2011), who conducted an empirical study of distressed targets during an economic crisis. The result showed that distressed firms received 34% higher premium than non-distressed firms during a crisis. It also shows that during a crisis, it is not profitable to buy distressed targets in trouble. Ang and Mauck (2011) explain that absolute prices are biased because of previous expectations about the underlying value of the target. During a crisis, the bias is the strongest since the value real is difficult to gauge in an uncertain time.

In short, the findings are divided on whether mergers and acquisitions of distressed targets create value. The effect of a distressed target on an acquirer's performance depends on many factors. First, firm-specific factors play a large role, such as the financial strength of an acquirer. Second, industry factors influence the acquirer's post performance, and this effect may differ if the distressed target has related or unrelated business. Finally, the economy plays a major role so that, for instance, the effect on performance can change during a crisis period. Since the findings differ significantly, it is appropriate to investigate this further.

2.4.2 Long-term performance

In addition to measuring short-term effects after an acquisition announcement, it is interesting to study the long-term effects as well. There are two methods to measure the long term effects of acquisitions, the buy-and-hold abnormal return (BHAR) and the calendar time approach (Rosen, 2006; Bouwman et al., 2009; Ang & Mauck, 2011). Ang and Mauck (2011) examine the effect of a distressed target during a crisis- and a normal period. They concluded that an acquirer firm has an insignificant BHAR of 2.87% during a normal period and a significant BHAR of 30.49% during a crisis period. They explain these insignificant returns by saying that, in a normal situation, the higher the premiums paid, the more the profits flow to the target. During the crisis period, it emerges that the top 1% percent provides a significantly positive BHAR causing the median to still remain negative at -10.78%. Rosen (2006) also investigates the long-run effect of a merger on an acquirer firm and finds an insignificant BHAR of -2.79%. As a result, it is still uncertain whether a takeover will have a positive or negative effect in the

long run. It may therefore be interesting to distinguish between distressed and bankrupt firms and analyze whether new findings are found here.

Table 1: Event studies acquirer firm abnormal return (meta table)

Author(s) (publication year)	Region	Time period	Method	Results
Johnson & Abbott (1991)	US	1973-1985	Market model, Estimation period (-310, -60)	Abnormal Dollar Gain: -20,613.5
Clark & Ofek (1994)	US	1981-1988	Market model, Estimation period (-300, -6)	CAR (-5, +1): -0.0140
Bartunek et al. (1995)	US	1978-1991	Market model, Estimation period (-230, -31)	CAR (0,+1): 0.0180
Hotchkiss & Mooradian (1998)	US	1979-1992	Market model, Estimation period (-250, -30)	CAR (-1, +1): 0.0250
Andrade et al. (2001)	US	1973-1998	Market model, Estimation period(-200, -5)	CAR (-1,+1): -0.0070
Moeller et al. (2003)	US	1980-2001	Market model, Estimation period (-205, -6)	CAR (-1, +1): 0.01030
Rosen (2006)	US	1982-2001	Modified market model, Industry based index	CAR (-2, +2): 0.01860, BHAR(1-year): -0.0666
Bouwman et al. (2009)	US	1979-2002	Modified market model, Equally weighted index	CAR (-1, +1): -0.0048, BHAR (2-year): -0.0722
Jory & Madura (2009)	US	1985-2006	Market model, Estimation period (-120, -11)	CAR (0, +2): 0.0240
Ang & Mauck (2011)	US	1977-2008	Market model, Estimation period unknown	CAR (-1, +1): -0.0106 (Normal), -0.0073 (Crisis)
Meier & Servaes (2020)	US	1982-2012	Market model, Estimation period (-205, -6)	CAR (-1, +1): 0.0328

2.5 Internal & external financing

To finance an acquisition, an acquirer can use internal and external funds. According to Modigliani and Miller (1958), there is no difference in performance between the two since they are two perfect substitutes for one other. However, this is only the case if the capital markets are perfect and efficient. Whereby the cost of capital is equal to the cost of the required amount of cash. In reality, the markets do not operate like this, they are imperfect and therefore the cost of capital is not equal. As a result, the costs of external funds is higher than the costs of internal funds. Major charges that cause this are attributable to transaction costs, agency problems, costs of financial distress, and information asymmetry (Myers & Majluf, 1984; Jensen, 1991). Transaction costs are especially high when equity is issued in the capital market. Issuing equity additionally has higher costs because of information asymmetry. Investors get the signal that the shares are overpriced. Since management does not issue shares when the old shares are seen as underpriced, because they are acting in the best interest of the existing shareholders. There is also information asymmetry when debt financing occurs. The lenders are not sure if the borrower can pay back in the future, so the interest rates rise. In addition, new debt can provide tax advantages, as there is a tax shield, reducing the cost of capital. However, too much debt

can also create extra costs if the risk of financial distress becomes too high (Myers and Majluf, 1984). However, public firms suffer less from these higher costs due to information asymmetry since their financial information is available, as opposed to private firms. As a result, market imperfections are minimal since investors can better assess the quality of the firm.

A takeover requires a hefty amount of money, which often means looking at multiple parties for mediation. Syndicated loans are an important source of financing, especially in the M&A market. A syndicated loan is a mix between private and public debt and a loan provided by at least two financial institutions (Sufi, 2007). The advantage of syndicated loans is that several financial institutions are connected to each other, allowing a large amount of money to be lent to the acquirer. Since there are multiple financial parties involved in the loan origination process, there is a much better focus on due diligence, which reduces information asymmetry. This reduces the risk for the lenders and is also more beneficial for the acquirer. Large banks, such as J.P. Morgan, Citi Group and Bank of America account for more than half of the entire U.S. corporate loan market, according to Ross (2010). These banks are therefore highly regarded for due diligence and monitoring of borrowers. Syndicated loans, with the goal of M&A transactions, have most of the time one of these banks as lead arranger, responsible for due diligence, monitoring as well as loan origination. These banks have a good reputation, issuing a loan for an acquisition sends a positive signal to the shareholders of both the target and the acquiring firm (Ross, 2010).

2.6 Hypotheses

In order to examine the effect of distressed acquisitions, the research question of this thesis is: '*To what extent are acquiring financially distressed and bankrupt companies valuable to the shareholders of the acquiring company?'.* To answer this question comprehensively, several hypotheses have been developed. This allows the main question to be examined from multiple perspectives.

Hypothesis 1: *'Acquiring a distressed target has a positive/negative impact on the abnormal return of the acquirer.'*

The first hypothesis has been contradicted in previous studies. Although the earlier studies have different findings, the study by Clark and Ofek (1994) is the most meaningful for this hypothesis. Namely, it examined the post-acquisition performance of the acquirer after a distressed acquisition, and they concluded that the acquirer experienced negative abnormal returns after an acquisition. In addition, their research is one of the few where the entire focus is centered on distressed targets. In contrast, Meier and Servaes (2020) found a positive effect of distressed acquisitions. One explanation is that distressed targets have a weaker bargaining position. Other studies, such as Johnson and Abbott (1991), Bruton et al. (1994), and Servaes (1991), show positive abnormal returns by distinguishing between firm- and industry-factors. This makes it interesting to focus on specific factors that cause positive abnormal returns to be experienced by the acquirer firm.

Hypothesis 2: '*The abnormal return of the acquiring firm is higher in a business-related distressed acquisition than in a business-unrelated distressed acquisition.'*

Hypothesis 2 relates to the research of Bruton et al. (1994). They found that a business-related acquisition of a distressed target has a positive impact on the acquirer's performance. They had several reasons for the results of their research. First, the bidder has a better understanding of the true value of the distressed target. Second, it makes the bidder more cautious about a distressed target, paying more attention to a thorough analysis of potential value. Finally, there is less competition among bidders. The latter relates to the 'winner's curse', which means that bidders will always outbid each other, and as a result they bid more than the true value. Thus, this is not the case in a distressed acquisition (Bruton et al.,1994). As the research sample runs from 1979 to 1987, it is interesting to see that similar results are found in a more recent period. In addition, Fowler and Schmidt (1989), Servaes (1991) and Jory and Madura (2009) conducted a overlapping study and reached the same findings. This, according to them is because the potential synergies are higher when the target firm and acquiring firm are from the same industry. Therefore, a distressed target is worth more to a related bidder than an unrelated bidder. As a result, a business-related acquisition can be assumed to have a positive impact on the performance of the acquirer compared to an unrelated acquirer.

Hypothesis 3: *'The acquiring firm's performance is positively related to the acquiring firm's financial strength in a distressed deal.'*

Hypothesis 3 relates to the research of Johnson and Abbott (1991). In their research, it emerges that an acquirer must be financially strong enough to make a distressed target a success. Because of this, a result also revealed that a merger has a negative impact on performance, as the distressed target is too large and therefore too risky. To represent the financial strength of an acquiring firm, financial ratios are used during this study, namely the insolvency- and profitability ratio. In addition to the financial power of the company, strength also refers to the size of the company relative to the distressed target. Clark and Ofek (1994) also demonstrated that the smaller the target relative to the acquirer, the greater the probability of success. Where the prediction is evident that the strength of acquirer firm has a positive impact on post-acquisition performance.

Hypothesis 4: *'The performance of the acquiring firm will be higher when the deal is financed by a syndicated loan.'*

Hypothesis 4 addresses the method of financing. Modigliani & Miller (1958) showed in their research that external financing carries higher costs compared to internal financing. However, this is less true for

public firms, since information asymmetry is reduced due to better availability of financial data. Syndicated loans are widely utilized in the mergers and acquisitions market because they can be used to make large loans. Multiple financial institutions are involved in a syndicated loan, so due diligence is done very extensively. If a deal is largely financed by a syndicated loan, it means there is confidence about the quality of the acquisition. This confidence will result in a higher share price for the acquiring firm, which favors the shareholders.

Hypothesis 5: *'The performance of the acquiring firm will be higher when it takes over a Chapter 11-bankrupt target firm compared to a distressed target firm.'*

In the previous literature, the findings are divided as to whether a bankrupt target in Chapter 11 has a positive or negative effect on acquirer firm, but the research of Amit et al. (1989) and Bartunek et al. (1995) are conclusive. Amit et al. (1989) show that the post-acquisition performance of a bankrupt-predicted target is lower compared to a non-bankrupt target because the target receives a lower premium. In addition, Meier and Servaes (2020) used a sharp definition for distressed and bankrupt firms, seeing that their sample group caused a positive CAR. Studies by Johnson and Abbott (1991), Warner (1997), and Altman (1984) show that there are many direct and indirect costs associated with bankruptcy, but these are primarily directed to the bankrupt target. This is because the costs are incorporated into the premium, which will result in a lower premium. So, this benefits the performance of the acquiring firm, because they have to bid less. Bartunek et al. (1995) further adds that due to Chapter 11 the assets are properly identified, making the potential value more visible. As the true value becomes more apparent, there is more certainty of success. As a result, the study expects that the benefits of acquiring a bankrupt firm, located in Chapter 11, are greater than those of a distressed target and this has a positive impact on the performance of an acquiring firm.

Hypothesis 6A: '*Acquiring a distressed target has a positive/negative effect on the long-term performance of the acquirer firm.'*
Hypothesis 6B: '*Acquiring a bankrupt target has a positive/negative effect on the long-term performance of the acquirer firm.'*

In addition to examining the short-term effects, it is particularly interesting to analyze the long-term effects. Long-term studies (Rosen, 2006; Bouwman et al., 2009; Ang & Mauck, 2011) have produced mostly insignificant results, however, the focus of these studies is on mergers in general and distressed targets. This study will additionally differentiate between distressed firms and bankrupt firms, making the focus different from previous studies. As a result, it is uncertain whether positive or negative effects will be found. The method used in this study to measure long-term effects is a long-run event study, where the buy-and-hold abnormal return (BHAR) is used.

3 Methodology

This chapter discusses the methodology required to conduct an informed study of distressed and bankruptcy acquisitions. Next, the event study is examined, covering the market model and the Fama-French 3-factor model required to calculate abnormal returns. Third, variables and ratios required for certain measurements and hypotheses are highlighted. Finally, regression models for each hypothesis are presented.

3.1 Methodology introduction

The purpose of this research is to arrive at a well substantiated conclusion, answering the main question, namely: '*To what extent are acquiring financially distressed and bankrupt companies valuable to the shareholders of the acquiring company?'.* Filing for bankruptcy is quite self-explanatory, but a distressed company can be viewed in different ways. Therefore, a distinction will be made between distressed and non-distressed companies. The distinction is made through two methods, by calculating the 'Interest Coverage Ratio' and constructing a 'Z-score' for each company. The two methods are a combination of previous studies. Johnson and Abbott (1991) and Ang and Mauck (2011) used the Z-score, while Andrade and Kaplan (1998) and Almeida et al. (2001) used the interest coverage ratio. Using both makes the study more reliable, since a double check is performed.

Subsequently, the short-term effect of a distressed target is examined through an event study. The cumulative abnormal return (CAR) is calculated by using the Fama-French 3-Factor model, which can reveal the effect of an acquisition announcement. After that, the impact of a distressed target is clear, and it is important to consider whether certain factors may affect CAR. Proxies are used for certain factors such as the business relationship between the target and the acquirer and the financial health of a company.

In addition, the effect between a distressed target and a target filing for bankruptcy is examined while looking at the short term effects, but also the long-term impact. The long-term effect is calculated through a long-run event study. Here, the buy-and-hold abnormal return (BHAR) is calculated per company over periods of 1 and 2 years. Finally, the regressions are performed through the programming software STATA. These methods are necessary to ultimately answer the hypotheses and thereby get a solid understanding about the short- and long-term effects of a distressed or bankrupt target on the acquirer firm.

3.2 Distress indicators

To split the sample into distressed and non-distressed firms, two methods are used. According to Almeida et al. (2011), using the interest coverage ratio is an appropriate measure for financial distress. The ICR ratio is a relation between a firm's profitability and debt that shows the condition in which a firm can pay its interest. It thereby measures how many times the firm can cope with the current interest costs. The higher the ratio, the less likely it is that a company will fail to pay its interest costs. A firm is

in financial distress if the ratio value is less than 1. Then, a company is unprepared for setbacks in the future or negative events that were not foreseen. The formula (1) of the interest coverage ratio is as described in the following:

$$(1)\quad Interest\ coverage\ ratio = \frac{Earnings\ Before\ Interest,\ \ Tax,\ \ Depreciation\ \&\ Amortization\ (EBITDA)}{Interest\ Expense - Long\ Term\ Debt}$$

To distinguish between distressed firms and relatively healthier firms, a dummy was created for financial distress. If the firm has a ICR-score lower than 1, it is labeled '*Distressed_ICR*' with value 1 and if it scores above 1 the firm is given the value 0. To ensure that a company does not incidentally have a lower ratio at the time of measurement, we look at 2 years prior to the announcement of the acquisition. If both years for the announcement have a score lower than 1 the firm is considered distressed.

The second method is to measure the Z-score of companies, according to Altman (1968). Although this method was developed long ago, it is still used in studies of distressed and bankrupt firms. Similarly, Ang and Mauck (2011) used the Z-score as a proxy for financial distress. The score is designed to calculate the probability of bankruptcy, which creates a continuous measurement for distress. The formula (2) of Z-score is as described in the following:

$$(2)\quad Z = 1.2\frac{Working\ Capital}{Total\ Assets} + 1.4\frac{Retained\ Earnings}{Total\ Assets} + 3.3\frac{EBIT}{Total\ Assets} + 0.6\frac{Market\ Value\ Equity}{Total\ Debt\ (Book\ Value)} + 1\frac{Sales}{Total\ Assets}$$

By giving weight to certain ratios, a credit-strength test is created. The higher the score, the less likely a company is to experience financial difficulties. A score lower than 1.8 indicates that the company is approaching bankruptcy. If the Z-score is higher than 3 it indicates a healthy company, which has a low probability of distress. Altman (1968) developed this score and was able to correctly predict which companies would go bankrupt in his sample with 94 percent accuracy. This result remained after several robustness checks and therefore the score has a high reliability. The firms in his sample were public, which is similar to the sample of this study. The financial variables are retrieved from the Compustat database via company's cusip-8 codes. To distinguish between distressed firms and relatively healthier firms, a dummy was created for financial distress. If the firm has a z-score lower than 1.8, it is labeled '*Distressed_Z*' with value 1 and if it scores above 1.8 the firm is given the value 0.

3.3 The event study

When an acquiring company takes over a target, there are several ways to examine the impact of its acquisition. Ultimately, a company belongs to shareholders, so that's where the focus will have to be. As a result, it is important to measure the effect of an acquisition on the acquirer's stock return. There are many factors that can affect the share price, making it difficult to determine the actual effect of an

acquisition. A solution is an event study which focuses on several days around the announcement date. This way, external factors have a minimal influence on the return of the shareholders and an accurate conclusion can be drawn about the impact of a distressed acquisition on the stock price. By conducting an event study, the abnormal return (AR) is calculated per day around the announcement day. The abnormal returns are cumulative residuals of a certain model, which are calculated through an estimation period. Once the abnormal returns are calculated they are enumerated to obtain the cumulative abnormal return (CAR). This CAR is calculated over an event window and is calculated per deal.

Many studies that focus on distressed acquisitions, such as Clark and Ofek (1994), Hotchkiss and Mooradian (1998), Ang and Mauck (2011), and Meier and Servaes (2020), use the market model method to calculate abnormal returns. The market model focuses on the capital asset pricing model CAPM. However, the CAPM is very simple, so the expected returns may deviate from the true value. The reason fit that is mainly that the CAPM only uses one variable to describe the returns of a stock relative to the market return. Therefore, this research not measures the abnormal returns with the market model, but with the Fama-French 3-factor model (Fama & French, 1995). This model uses multiple factors that can affect the value of a return, giving it a more realistic and reliable picture of the expected returns.

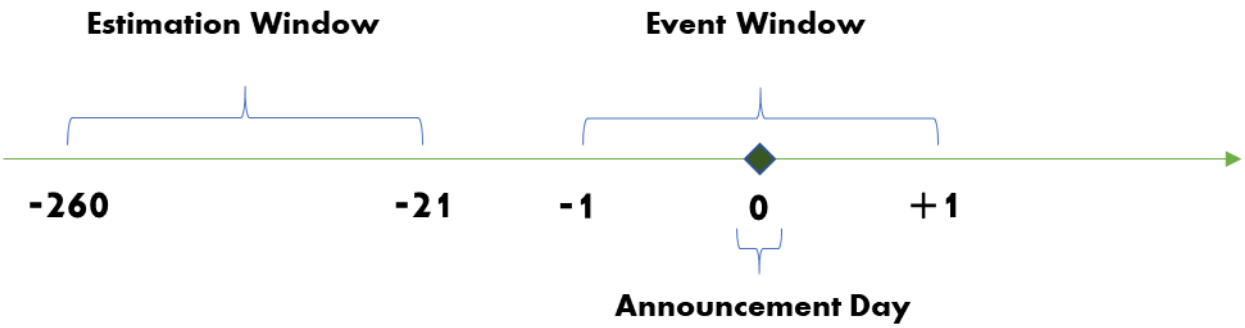
Clark and Ofek (1994) were among the first to examine the effect of distressed acquisitions with an event study and concluded that abnormal returns were not significantly different from 0 when using the event window -5 to 1. On the other hand, Ang & Mauck (2011) observed that an acquisition of a distressed target has a significant negative effect on acquirer returns compared to a normal target (-1.06%). For the event study, they had a period of 1977-2008. Meier & Servaes (2020) had a time period from 1982 to 2012, however, they saw that a distressed acquisition leads to a significantly higher result (3.28%). This makes it interesting to investigate what the result of this study will be with a time period of 2000 to 2020, as there are many contradictory results from previous studies.

3.3.1 Estimation parameters

An event study can be used in several ways to calculate the abnormal returns of acquirer firms. This requires an estimation period to calculate the expected returns and an event window to finally arrive at the abnormal returns. Past studies such as Clark and Ofek (1994), as well as current studies including Meier and Servaes (2020), use the announcement date as the zero point (0) for the event study. From the moment an acquisition takes place, shareholders speculate on the stock market and there will be an immediate effect on the stock price. It is assumed here that there is an efficient market, where information immediately causes a change. This stud uses the announcement dates of the deals from the Thompson One database and the dates needed for the event study are from the CRSP database, which can be found at WRDS. Previous studies used an estimation period from latest 310 days before the announcement day to latest 5 days before the announcement day, as can been seen in Table 1. For this study, an estimation period of -260 to -21 before announcement day (0) is chosen. A gap between the

estimation period and the event window is used as well. There is a gap between the end of the estimation window and the beginning of the event window, as this reduces the probability of the risk model estimation being influenced by the event-induced return variance. The event window will focus as in previous studies on a small period of 3 days around the announcement day (-1, +1). Bigger windows will also be used so there is a proper overview of the impact of an acquisition. The problem, however, is that a larger 20-day window around the announcement date can lead to a biased view. Namely, other events are taken into account by a window that is too wide, so the measurement of the effect of an acquisition is no longer accurate. Therefore, the main focus will be on a small window (3-day), as this will provide the study with accurate findings. An estimation period of day -260 to -21 gives a reasonable estimate about the expected returns. This cannot be too short, since then there is a skewed view of the expected returns. Figure 1 visually represents the parameters of the event study.

Figure 1: Event study period



3.3.2 Event study risk models

The expected returns can be calculated in several ways. Previous studies use the market model, which is based on the CAPM. The capital asset pricing model (CAPM) is based on the modern portfolio theory (MPT) developed by Markowitz (1952). He claims with the MPT that under ideal market conditions, there is a positive relationship between the expected return and the risk. Therefore, if a higher return is desired, it results in more risk being taken. The CAPM shows that risk can be divided into two different types, systematic risk and unsystematic risk. Unsystematic risk can be eliminated through diversification, leaving only systematic risk in the model. This formula is used to calculate the expected return of the acquirer firm. The beta indicates the sensitivity of stock returns to market returns. The risk free rate is subtracted from the market return, resulting in only the market risk premium. Critics including Fama and French (1995) showed that there are better risk models than the market model and added two variables to the risk model. In their research, it emerged that with the market model an average of 70% of diversified portfolio returns is explained, while with their new model an average of 90% is

explained. The variable "Small (market capitalization) Minus Big" and High (book-to-market ratio) Minus Low were added to the market model, resulting in the equation as follows:

$$(3)\quad E(R_{i,t}) = rf + \alpha_{i,t} + \beta_i(Rm_t - rf) + \beta_{i,j}(SMB_t) + \beta_{i,k}(HML_t) + \varepsilon_{i,t}$$

Indeed, they found that firms with a relatively small market capitalization achieve better returns than the entire market. The same is true for companies with higher book-to-market ratios. A higher book-to-market is defined as a value stock, as opposed to a growth stock, according to Fama and French (1995). The market returns and factors for the 3-factor model are available on the Kenneth French database, which can be found at WRDS as well. Since the 3-factor model is a more accurate model, the focus of this study will be on the 3-factor model. However, the market model will also be used to check for differences in outcomes.

3.3.3 Abnormal return

Once the expected returns are calculated, the subsequent step of the event study is to compute the abnormal returns (AR). The abnormal return represents the difference between the actual return and the normal return. The normal return is calculated from the previous method, which refers to the expected return that emerged from the Fama-French 3-factor model. The abnormal return is formulated as follows:

$$(4)\quad AR = R_{i,t} - E(R_{i,t})$$

The abnormal returns are calculated over the entire event window, so each day gets a specific abnormal return. A positive (negative) value shows that a company achieved a higher (lower) return than was expected that day. The expected return assumes a result without special events, so there may be a difference from the actual return as an acquisition is announced. For the study, one wants to measure the effect of the acquisition and thus the effect of the entire event window. Therefore, the abnormal returns are cumulated for the entire event window per company, resulting in the Cumulative Abnormal Return (CAR). The CAR is formulated as follows:

$$(5)\quad CAR_{i,t} = \sum_{t=1}^{t} AR_{i,t}$$

This can be used to measure whether the total effect of the acquisition announcement is significantly different from 0 and thus actually affects the returns of the company. To measure the total effect of the entire sample, the average of the CAR is calculated, and this results in the cumulative average abnormal return (CAAR), formulated as follows:

$$(6)\quad CAAR = \frac{1}{n}\sum_{i=1}^{n} CAR_i$$

Since there are two different methods of calculating the abnormal returns, two different samples are created, each with its own CAAR. In addition, within these samples a distinction can be made between distressed CAAR and non-distressed CAAR. To measure whether there is a significant deviation from 0 the T-test is used. This way it can be determined if there is a significant effect of the announcements.

$$(7)\quad T = \frac{CAR(t1,t2)}{\sqrt{VAR(CAR\ (t1,t2))}}$$

3.4 Long-run event study

In addition to measure the short-term effect, it is also interesting to know the long-term impact of an acquisition. This can be measured by using a long-run (horizon) event study, where an event window of longer than one year is used. As previously noted, a very wide event horizon results in a greater risk of bias. In fact, there may be other factors more easily affecting returns during the event period. The choice of a risk model can have a significant impact on the results. This is caused by the systematic errors that occur with imperfect normal return indicators are amplified over the long run. Even though there will be a higher risk of misspecification, there is a valid method that can calculate the long-term effect. For this study, the buy-and-hold abnormal return (BHAR) method is used. The BHAR method shows the difference of the buy-and-hold returns of the acquirer firm and a matched portfolio. The match is based on similarities in firm characteristics. The method is formulated as follows:

$$(8)\quad \prod_{t=s}^{T}(1 + E(R_{i,t})) = \sum_{i=s}^{n_t}(w_{i,s}\prod_{t=1}^{T}(1 + R_{i,t}))$$

This method calibrates average returns from a strategy in which all firms that have had an event are bought, while similar firms without an event are shorted within the event period. Another method of measuring long-term effects is by calculating the annual CAR. However, the annual CAR is not chosen, as differences may arise in empirical results. According to Barber and Lyon (1997), the BHAR is on average lower than the annual CAR but exceeds the annual CAR if the BHAR has an increase of 28% or higher. As a result, the BHAR method is a better source when looking for significant deviation from 0. The method of determining the long-term return of a benchmark portfolio is by first compiling the returns of the securities that form the portfolio and then calculating the average among the securities.

3.5 Linear regressions

To examine the hypotheses, proxies are needed that can describe the effect of a phenomenon. In addition, control variables are also needed to test whether effect is not caused by external factors. This section describes the proxies and control variables, and then shows how the regressions are constructed.

3.5.1 Related industry

For the second hypothesis, this research tests whether a business-relationship between the acquirer firm and the target firm is beneficial to the acquirer's performance. The studies from Fowler and Schmidt (1989) and Servaes (1991) showed that higher potential synergies can be achieved if the companies are from the same industry and related to each other. To examine whether the companies have a relationship with one other, the focus is on industry relatedness. Since this is a good indicator that the companies are present in the same market. The industry relatedness is measured by examining the US SIC code of a company. The SIC code is taken from the Thompson One database. A dummy is created from the proxy *Industry relatedness*, where the dummy is given the value 1 if the acquirer firm and the target firm's first three digits match. And it gets the value 0 if less than 3 digits are the same. In addition to similarities in industry, an acquirer firm may already have a solid relationship if it already owns shares of the target. This gives the acquirer an advantage in knowledge over external bidders and allows them to make a better evaluation of achievable synergies. A *Toehold* dummy is created, where it takes the value 1 if the acquirer firm owns a percentage of shares before the announcement. As with *Industry relatedness*, the required data is extracted from the Thompson One database.

3.5.2 Financial strength

The third hypothesis claimed that financially strong acquirer firms perform better in contrast to financially weaker acquirer firms. This is also true for distressed acquisitions, since a firm needs a lot of slack to be able to help and provide capital to the distressed target. A distressed target has solvency problems that prevent it from investing in future investment opportunities with a positive net present value (NPV) and therefore misses chances to grow. Johnson and Abbott (1991) additionally showed that an acquirer must be financially strong, otherwise there is a chance that a distressed target will take the acquirer with it in its fall. One way to measure this is through the solvency ratio. The solvency of a company is very important to indicate its financial health for the future. A positive solvency ensures that if a company would stop, the debts can be paid off by the assets, since the assets are greater than the debts. The solvency ratio is measured one fiscal year before the acquisition and one fiscal year after the acquisition. This allows for measurement of the effect of the acquisition on the solvency of the acquirer firm. Distinguishing between distressed public and non-distressed public reflects the difference in solvency between the groups. A t-test is performed to measure the difference between the groups before the acquisition and after the acquisition. The solvency ratio can be calculated using the following formula:

$$(9)\quad Solvency = \frac{Total\ Equity}{Total\ Liabilities}$$

Another way to measure financially strength is through the profitability ratio. The ratio is calculated one year before the announcement and right before it, so there is a more realistic view of the profitability,

since there is a smaller chance that the company will happen to have higher or lower profits than normal. The proxy is developed by the following formula:

$$(10)\ Profitability = \frac{Earnings\ Before\ Interest,Tax,Depreciation\ \&\ Amortization\ (EBITDA)}{Total\ Assets}$$

Subsequently, one can also look at the *relative size* of the companies. If an acquirer is relatively a lot bigger in size than the target, the target can more easily be provided with the necessary capital. In addition, the acquirer is also less likely to be pulled into insolvency, as relatively less major investment is required. Relative size is measured by total assets, where the total assets of the target are divided by the total assets of the acquirer.

3.5.3 Syndicated loan

The fourth hypothesis of this study examines the way of financing the acquisition. Certainly, a distressed target needs a fair amount of slack to get back on track and this will be financed by the acquirer. An acquirer can arrange the financing internally or externally. If the acquirer firm does not have enough internal capital, it can raise external debt from a bank or it can issue equity in the capital market. Moeller et al. (2004) showed that cash deals provide positive abnormal returns to acquire shareholders compared to stock deals. This is because a payment with stocks is a sign of excess value, so shareholders expect the true value to be lower and this causes the share price to fall. To examine the effect of using external debt for an acquisition, syndicated loans are examined. A syndicated loan, which is also known as a syndicated bank facility, is the financing offered by a group of lenders. This group works together to offer funds to the acquirer. An acquisition costs a lot of money, so it is often difficult for one party to finance it. Therefore, a syndicated loan is a good solution when an acquirer needs external debt. To examine the effect of external debt, this study uses the amount of syndicated loans as a proxy, the syndicated loans destined for acquisitions are used. The amount of syndicated loans is divided by the deal value to give an indication of the amount of external debt used for the acquisition. In addition, only syndicated loans that occurred before effective date of the deal are included. The Thompson One database provides the data of syndicated loans.

3.5.4 Control variables

In addition to the variables important to the study, other factors may influence abnormal returns after a takeover. Therefore, control variables that affect the deal were included, called deal characteristics. And there are control variables included that may affect firms, called firm characteristics. These can be found in Table A1 (Appendix A). The variables have also been used in previous studies, such as those by Jory & Madura (2009), Ang and Mauck (2011), and Meier & Servaes (2020), making the study more reliable.

3.5.5 T-tests and OLS Regressions

To test the hypotheses, OLS regressions will be conducted for this study. The first hypothesis indicates that distressed acquisitions have a positive or negative impact on the acquirer's CAR. To test this, first, a single-sample t-test is conducted to measure whether there is a significant difference in the mean of CAR between the distressed group and the non-distressed group. This research expects with this test that the difference is significantly different from 0. In addition, the mean of distressed group is expected to be smaller than the non-distressed group. Furthermore, an OLS regression will be conducted for this hypothesis, which will focus on a distress dummy with firm and deal characteristics as control variables. Two regressions are used, while there are two methods of measuring financial distress. Additional, influences over time are also included in regression. The regressions will be presented as follows:

$$(11a)\ CAR = \alpha + \beta_1 \text{DISTRESS\_ICR} + \beta_2 - \beta_6 \text{FIRM\_controls} + \beta_7 - \beta_{11} \text{DEAL\_controls} + \beta_{12} \text{Crisis\_period} + \beta_{13} \text{YEAR\_FIXED\_EFFECTS} + \varepsilon$$

$$(11b)\ CAR = \alpha + \beta_1 \text{DISTRESS\_Z} + \beta_2 - \beta_6 \text{FIRM\_controls} + \beta_7 - \beta_{11} \text{DEAL\_controls} + \beta_{12} \text{Crisis\_period} + \beta_{13} \text{YEAR\_FIXED\_EFFECTS} + \varepsilon$$

The second and third hypotheses focus on factors that may influence the CAR of a distressed deal. The second hypothesis expects business-related distressed acquisitions to earn a higher CAR than business-unrelated distressed acquisitions. The regression is formulated as follows:

$$(12)\ CAR = \alpha + \beta_1 \text{INDUSTRY\_RELATED} + \beta_2 \text{TOEHOLD} + \beta_3 (\text{DISTRESS} * \text{INDUSTRY\_RELATED}) + \beta_4 (\text{DISTRESS} * \text{TOEHOLD}) + \beta_5 - \beta_9 \text{FIRM\_controls} + \beta_{10} - \beta_{13} \text{DEAL\_controls} + \varepsilon$$

The third hypothesis deals with the financial strength of an acquirer. The acquirer's CAR is expected to be positively related to the financial strength of an acquiring firm during a distressed deal. The variable used to test this hypothesis are the *Solvency_before, Profitability* and the *Relative_size*. *Solvency_before and Profitability* is expected to have a positive relationship with *CAR*, and a negative relationship between *Relative_size* and *CAR*. The regression is shown as follows:

$$(13)\ CAR = \alpha + \beta_1 \text{SOLVENCY\_BEFORE} + \beta_2 (\text{DISTRESS} * \text{SOLVENCY\_BEFORE}) + \beta_2 \text{PROFITABILITY} + \beta_3 (\text{DISTRESS} * \text{PROFITABILITY}) + \beta_4 (\text{RELATIVE\_SIZE}) + \beta_5 (\text{DISTRESS} * \text{RELATIVE\_SIZE}) + \beta_6 - \beta_9 \text{FIRM\_controls} + \beta_{10} - \beta_{14} \text{DEAL\_controls} + \varepsilon$$

Hypothesis 4 addresses the method of financing, which is focused on syndicated loans. Syndicated loans are very popular in the M&A world, as large loans can be extracted from them. It is expected that a distressed deal financed by a syndicated loan will obtain a higher acquirers' CAR than if the deal is financed in another way. As a result, a positive relationship is expected between the dependent *CAR* and the variable *Syndicated_loan*. The regression will appear as follows:

$$(14)\ CAR = \alpha + \beta_1 \text{SYNDICATED\_LOAN} + \beta_2(\text{DISTRESS} * \text{SYNDICATED\_LOAN}) + \beta_3 - \beta_7 \text{FIRM\_controls} + \beta_8 - \beta_{12} \text{DEAL\_controls} + \varepsilon$$

In addition to examining distressed deals, the research considers the differences between bankrupt- and distressed deals. The hypothesis shows that Chapter 11-bankrupt deals are expected to cause a higher CAR than distressed deals. A single-sample t-test is conducted in this section, since bankrupt deals have not yet been focused on. This t-test assumes that there is a significant difference between the bankrupt group and the distressed group, with the bankrupt group causing a higher CAR average relative to the distressed group. Next, an OLS regression is performed to induce more robustness. The variable *Bankrupt* is expected to have a more positive relationship with the dependent variable *CAR* than the variables *Distress_ICR* and *Distress_Z*. Only the deal characteristics were added to the regressions, because the bankrupt deals have many missing values. Since there are two distress methods, the following regressions are as follows:

$$(15a)\ CAR = \alpha + \beta_1 \text{BANKRUPT} + \beta_2 \text{DISTRESS\_ICR} + \beta_3 - \beta_7 \text{DEAL\_controls} + \varepsilon$$

$$(15b)\ CAR = \alpha + \beta_1 \text{BANKRUPT} + \beta_2 \text{DISTRESS\_Z} + \beta_3 - \beta_7 \text{DEAL\_controls} + \varepsilon$$

In addition to investigating the short-term effects, this study also examines the long-term effects of the distressed and bankrupt acquisitions. As there are many contradictions found in previous studies, the hypothesis expects that a distressed or a bankrupt acquisition has a negative/positive effect on the long-term performance of the acquirer firm. To measure the impact of acquisitions over the long term, the BHAR is used as dependent variable. The regression will then be as follows:

$$(16A)\ BHAR = \alpha + \beta_1 \text{DISTRESS\_ICR} + \beta_2 - \beta_7 \text{FIRM\_controls} + \beta_8 - \beta_{12} \text{DEAL\_controls} + \varepsilon$$

$$(16B) BHAR = \alpha + \beta_1 \text{BANKRUPT} + \beta_2 - \beta_6 \text{FIRM\_controls} + \beta_7 - \beta_{11} \text{DEAL\_controls} + \varepsilon$$

4 Data

This chapter will focus on the data gathering needed for the study and the elimination process. In addition, it will describe particular sources needed to find particular data and ultimately describing the final sample.

4.1 Data collection

This research concentrates on M&A deals that are announced in the period from January 1, 2000 to December 31, 2020. For the investigation of distressed and bankrupt targets, the focus has been placed on deals that are located in the US. Since Chapter 11 is a US law, the acquirer firm and target firm must both be located in the US. Thompson One, Compustat Capital IQ (WRDS), CRSP database (WRDS), and the UCLA-LoPucki Bankruptcy Research Database were primarily used for this research. First, Thompson One is consulted to collect the announcement dates. As Thompson One specializes in M&A deals, there are also deal characteristics retrieved from the platform. Second, the stock returns were retrieved via CRSP, while there were only US firms included in the sample. Since data was needed 2 years before the announcement and 2 years after the announcement, stock returns from 1998 up to 2021 were retrieved from the CRSP database. Third, financial data was used to calculate certain ratios, such as the Z-score, the interest coverage ratio and the Tobin's Q, were retrieved from Compustat Capital IQ through the Cusip-8 code. As Thompson One does not have ISIN codes, they were retrieved via Datastream with Datastream codes. In fact, an ISIN code can be easily transferred into a CUSIP-8 code, which was needed for CRSP and Compustat Capital IQ. In addition, the syndicated loans were also retrieved from Thompson One database, and the loans were linked to the deals through the date of issuance and the Cusip code. Syndicated loans have the important criterion that they are for acquisition purposes only.

Table 2 describes the criteria that mergers and acquisitions in the Thompson One database need to meet. The criteria are in line with similar studies on distressed companies, namely Ang and Mauck (2011) and Almeida et al. (2011). The initial sample of mergers and acquisitions announced between 2000 and 2020 totals 492,905 transactions. If the fact that the target and the acquirer are publicly traded is taken into account, 109,232 companies remain. Considering that stock data is needed for an event study, both companies must be public. In addition, the acquirer must acquire 51% or more of the shares of the target, since for this study only majority acquisitions are included, in which an acquirer controls a target. Furthermore, only completed deals were included in the sample, as deals may break down after an announcement. This ultimately affects the stock returns and can give a misleading result. Finally, the deal must be worth more than $1 million, as the target needs to be large enough to have an actual effect on the acquirer's stock returns. By incorporating all the criteria, the final sample consists of 3,452 deals.

Table 2: Criteria sample selection

This table shows the search criteria to arrive at the public deals samples. The database used for this purpose can be found at Thompson One.

Request	Operator	Description
Database	Include	All Mergers & Acquisitions
Acquiror Public Status (Code)	Include	Public
Target Public Status (Code)	Include	Public
Acquiror Nation (Code)	Include	United States of America
Target Nation (Code)	Include	United States of America
Date Announced	Between	01/01/2000 to 12/31/2020
Percent of Shares Acquired in Transaction	Between	51 to HI
Deal Status (Code)	Include	Completed
Deal Value ($ Mil)	Between	1 to HI

In addition, considering that Ang and Mauck (2011) do not include companies from the financial industry as they are very different in deposit insurance, government subsidies and leverage capacity, this study applies the same method. The companies that have a SIC code starting with a 6 are eliminated, these are the companies that fall under Finance, Insurance and Real Estate. This allows for more similarity in the sample which ultimately leads to more robust results.

Observations are eventually dropped as the focus is on distressed targets and this requires further variables through Compustat. Distressed targets were measured in two different methods, namely by the Interest Coverage Ratio and the Z-score of Altman (1968). This research will elaborate on the methods in a subsequent chapter. The use of two different methods ultimately creates two samples, as different variables are used. With the use of the ICR, 659 deals remain in the end. With the ICR score, the sample has 158 companies that are in financial distress, and thus have a score below 1. That is 23.98% percent of the total sample. The Z-score contains many different financial ratios, so when using this method 591 deals remain, due to more missing values. Calculated with the Z-score, 24.37% of the sample is in financial distress, so this is approximately the same proportion as the ICR method. Appendix B shows a quantity of deals by year and by type. It is notable that under the ICR method, distressed transactions predominate in the early years of the sample, whereas under the Z-score method, this is more spread across the entire sample. What is similar, however, is that most distressed deals occur in the year 2001. The non-distressed deals are evenly distributed across the years in both methods. To make the study accurate, a distinction was made between public and private firms. The same criteria was used for the private firms as for the public firms. From the 13,597 private deals, 932 deals remained that had the required financial information for the ICR-method. A total of 678 private transactions remained for the Z-score method, of which 172 targets are in financial difficulty.

In addition to distressed firms, the focus will be on firms that file for bankruptcy. Thompson One has few observations of public companies under Chapter 11, so the bankruptcy sample is supplemented with observations from the UCLA-LoPucki Bankruptcy Research Database. This is a

database where all public firms can be found with a minimum value of $100 million that filed under Chapter 11. Combining the observations of Thompson One and the Bankruptcy Database, there were 61 deals remaining. Only some deals were missing financial data or identifier keys, so the final sample of bankrupt targets consisted of 41 deals. As there are only 41 bankrupt public deals to analyze, an additional sample is created that includes private targets. This adds 82 bankrupt private targets, making a total of 123 bankrupt deals.

In Appendix C, the deals are subdivided into industries, by using the SIC-code. What emerges is that two industries predominate in the sample, namely the Manufacturing industry and the service industry. Both in the distressed and non-distressed companies, these industries are dominating. This is consistent with previous studies (Clark & Ofek, 1994; Ang & Mauck , 2011).

Table 3 shows the descriptive statistics of the variables used in this study. The sample is divided into public distressed and non-distressed public targets, in which table 4 applied the ICR method. Table D1 (Appendix D) shows the descriptive statistics of Z-score method.

Table 3: Summary statistics; ICR-method

This table shows Sample A, which used the ICR method to measure distress. The distressed public targets group is shown at the top and the non-distressed public group at the bottom. The descriptive statistics of sample B, where the Z-score was used to measure distress are shown in Table D1 (Appendix D).

	Mean	*Median*	*Std. Dev.*	*25th Pct.*	*75th Pct.*
Distressed					
ICR	-93.3233	-17.7567	201.2632	-94.6573	-2.9858
Z-score	-	-	-	-	-
Profitability	0.1017	0.1142	0.1392	0.0535	0.1923
Relative_size	0.2193	0.0554	0.3419	0.0104	0.3165
Syndicated_loan	0.6857	0.2031	2.4352	0.0000	0.7432
Firm_size_Ta	0.6074	1.0025	17.7761	0.4233	4.0183
Firm_size_Acq	177.8624	32.6524	395.6443	5.2748	151.2941
Q_Ta	1.8632	1.0309	2.0091	0.5869	2.1306
Q_Acq	2.3253	1.6641	1.9729	1.0874	2.8859
Cash payment	0.5567	0.7753	0.4622	0.0000	1.0000
Bidders	1.0443	1.0000	0.2353	1.0000	1.0000
Industry_related	0.6835		0.4665		
Defence	0.0250		0.1572		
Toehold	0.0316		0.1756		
Hostile	0.0253		0.1575		
Crisis_period	0.2088		0.4077		
Observations	158				
Non-distressed					
ICR	16.1130	4.9728	186.8144	2.1077	13.7830
Z-score	-	-	-	-	-
Profitability	0.1555	0.1423	0.0781	0.1069	0.2006

Relative_size	0.3561	0.1823	0.4641	0.0493	0.4694
Syndicated_loan	0.4872	0.1068	2.1133	0.0000	0.7294
Firm_size_Ta	29.7489	7.5176	61.4800	2.1619	27.3738
Firm_size_Acq	203.4715	391.0237	54.0998	18.1083	227.5606
Q_Ta	1.2904	0.9955	1.0622	0.5986	1.6684
Q_Acq	1.5463	1.2560	1.2827	0.7137	1.9376
Cash payment	0.6049	0.7491	0.4160	0.1293	1.0000
Bidders	1.0878	1.0000	0.3229	1.0000	1.0000
Industry_related	0.5409		0.4988		
Defence	0.0319		0.1760		
Toehold	0.0159		0.1254		
Hostile	0.0658		0.2482		
Crisis_period	0.1616		0.3685		
Observations	501				

5 Results

Within this chapter the results of the study will be presented. At first, the effect of a distressed acquisition on the stock returns of the acquiring firm will be examined. Then, the possible factors of distressed deals and the effect of syndicated loans are investigated. Subsequently, the differences between distressed - and bankrupt deals are presented. Finally, the long-term effects of distressed and bankrupt targets are further examined.

5.1 *Distressed acquisition*

To investigate the effect of a distressed acquisition on the performance of the acquirer firm, this section focuses on the CAR. The hypothesis central to this is as follows:

Hypothesis 1: *'Acquiring a distressed target has a positive/negative impact on the abnormal return of the acquirer.' (Two-sided t-test)*

To investigate whether there is a difference in the CAR, two methods are used. Table 4 presents the CAR in which the sample is split into two groups, namely non-distressed and distressed public targets. There are two samples used to investigate the effect of distressed targets. Sample A was created because the distress is defined by the interest coverage ratio (ICR). A target is distressed if it has an ICR value below one. Sample B uses the Z-score to define distress, where a target is distressed if it has a z-score lower than 1.8. Because more variables were needed for the z-score, two samples were created, providing more observations. Sample A, where the interest coverage method is used, gives a significant difference of 2.17% between the groups using the CAR window (-1,+1), in which public acquirers of public distressed targets have a lower CAR than acquirers of non-distressed public targets. In addition, Table 4 uses the Fama-French 3-factor model to calculate expected returns. The widest window (-10, +10) shows a significant difference of 2.86% at significance level of 5% and the narrowest window around the announcement date (-1, +1) shows a difference of 2.17% with significance level of 1%. Sample B is presented in Table 4 as well, in which the groups are split according to the Z-score. The Z-score method displays the same results as sample A, which makes the methods work accurately. The broader windows do not show a significance difference, but the windows (-1, +1) and (0, +2) show a significant difference between the groups with significance level 5%. As previous studies focus on narrow windows, due to the lower likelihood of external influences, it is assumed that distressed deals cause a significantly lower CAR. The results from the samples A and B indicate that public distressed firms cause significantly lower CAR from a public acquirer, allowing the null hypothesis to be rejected. Only an OLS regression is still performed, since variables that may affect the value of CAR have not yet been controlled for.

Since this study mainly builds on the more recent studies by Ang and Mauck (2011) and Meier

and Servaes (2020), the same window (-1, +1) is used as them in the following regressions of this section. Figure E1 and E2 (Appendix E) show the boxplot of distressed public targets and non-distressed public targets for both distress methods. E1 and E2 show a similar distribution. The CAR (-1, +1) is winsorized at 1%, leaving a couple outliers present among the non-distressed public targets. The outliers do not have unrealistic CAR values, so they remain in the regressions of this chapter.

Table 4: Cumulative abnormal return

Notes. Sample A is divided by the Interest Coverage Ratio (ICR). A target falls under distress if it has an ICR value below 1 for 2 years before the announcement date. There are 158 targets public distressed and 501 targets public non-distressed in sample A. Sample B is divided by the Z-score. . A score lower than 1.8 indicates that the company is in distress. If the Z-score is higher than 3 it indicates a healthy company, which has a low probability of distress. There are 155 targets public distressed and 436 targets public non-distressed in sample B. The acquirer and target are both located in the United States. A t-test is performed for the differences between the groups. The P-value is based on the difference between the mean of the groups. The values *, ** and *** denote the significance levels of 0.10, 0.05 and 0.01. Finally, the ratios are winsorized at 1%.

Sample A: Interest coverage ratio; public targets

Column1	*Distressed*	Column2	*Non-distressed*	Column3	*Difference*	Column4
	Mean	*Median*	*Mean*	*Median*	*Mean*	*P-value*
CAR(10,10)	-0.0467	-0.0231	-0.0181	-0.0125	0.0286**	0.0188
CAR(-5,5)	-0.0311	-0.0113	-0.0118	-0.0075	0.0193**	0.0430
CAR(-3,3)	-0.0342	-0.0139	-0.0128	-0.0099	0.0214**	0.0131
CAR(-1,1)	-0.0330	-0.0123	-0.0113	-0.0065	0.0217***	0.0035
CAR(0,2)	-0.0320	-0.0080	-0.0115	-0.0050	0.0204***	0.0062

Sample B: Z-score; public targets

Column1	*Distressed*	Column2	*Non-distressed*	Column3	*Difference*	Column4
	Mean	*Median*	*Mean*	*Median*	*Mean*	*P-value*
CAR(10,10)	-0.0411	-0.0251	-0.0232	-0.0160	0.0179	0.1630
CAR(-5,5)	-0.0310	-0.0172	-0.0145	-0.0105	0.0164	0.1026
CAR(-3,3)	-0.0308	-0.0201	-0.0174	-0.0119	0.0135	0.1438
CAR(-1,1)	-0.0341	-0.0208	-0.0158	-0.0076	0.0183**	0.0168
CAR(0,2)	-0.0347	-0.0180	-0.0162	-0.0054	0.0185**	0.0149

To broaden the study, there is also an analysis in Appendix F about the effect of private distressed targets and private non-distressed targets. In Table F1 (Appendix F) , the sample is divided into distressed and non-distressed by the use of the ICR. Table F1 shows that the average acquirer's CAR of private distressed targets in narrow windows is lower than that of private non-distressed targets, but the effect is not significant. In Table F2 (Appendix F), the sample is divided by using the Z-score. The results are similar as Table F1, but in CAR(-1, +1) and CAR (0, +2) private distressed targets provide a significantly lower mean compared to private non-distressed targets with a difference of 1.30% and 1.44% at significance level 10%.

Table 5 shows the regressions of a distressed public acquisition. In this model, the CAR (-1,+1) is the dependent variable, focusing on the effect close to the announcement date. The model is split into two samples, sample A, where the ICR method is used and sample B, where the Z-score method is used. Regression 1 of sample A indicates that if a target is distressed, there is a significant negative effect relative to the acquirer's CAR. However, the first regression is simple and the control variables are excluded, so the R-squared is very low. To be more certain about whether there is a negative effect, control variables are used in regressions (2) and (3), which was used by Ang and Mauck (2011) and Meier and Servaes (2020) as well in their research. In regression (2), firm characteristics were added to the regression and in regression (3), deal characteristics were added. In both cases, *Distress_ICR* remains significantly negative, and when the control variables are combined in regression (4). When the control variables are combined, CAR falls 2.02% when the target is distressed. This result is significant at level 1%. Regressions (5) and (6) test whether a financial crisis or time are influencing factors. However, even with these regressions, it remains clear that distressed targets cause a negative effect on the acquirer's CAR.

Regressions were also conducted with the two private distressed samples of Appendix F, but there is no significance found. One reason for this could be that distress among private targets is a less important incentive for the acquirer's shareholders. In addition, according to Moeller et al. (2003), there is more information asymmetry among private firms, since public firms have to be more transparent about their financial data. The results of the private targets may be skewed as only 678 observations were observed (Z-method) due to missing values, while there were 13,657 private deals in the sample period.

Table 5: Regression hypothesis 1; distressed public deals

Notes. An OLS regression is performed on the sample of total 659 public deals over a period of 2000-2020, with 158 public deals distressed. The dependent variable is the acquirers' CAR over window -1 to +1, with day 0 as the announcement date. A target falls under distress if it has an ICR value below 1 for 2 years before the announcement date. In regression (2), firm characteristics are added as control variables and in (3) deals characteristics are added. The year fixed effect is not shown in the table but are included in regression (6). The T-value is shown between parentheses. The values *, ** and *** denote the significance levels of 0.10, 0.05 and 0.01. The regressions were all run with robust standard errors. The definitions of the variables can be found in Table 2 in the methodology section. The regressions of Sample A are presented below and the regressions of Sample B are presented in Table G1 (Appendix G).

Sample A: Interest coverage ratio

Variables	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
Distress_ICR	-0.0217***	-0.0293***	-0.0202***	-0.0249***	-0.0249***	-0.0293***
	(-2.95)	(-3.41)	(-2.82)	(-2.86)	(-2.83)	(-3.28)
Total_Assets_TA		-0.0048		-0.0067***	-0.0067***	-0.0086***
		(-1.27)		(-3.08)	(-3.08)	(-3.60)
Total_Assets_Acq		0.0017		0.0032	0.0032	0.0029
		(0.52)		(1.33)	(1.33)	(1.18)

Relative_size		0.0052 (0.96)		0.0053 (0.98)	0.0053 (0.98)	0.0047 (0.88)
Q_TA		-0.0001 (-0.55)		-0.0001* (-1.71)	-0.0001* (-1.70)	-0.0017 (-0.38)
Q_Acq		-0.0024 (-1.48)		-0.0022 (-1.41)	-0.0022 (-1.41)	-0.0001 (-1.23)
Cash payment			0.0204 (1.04)	0.0221 (1.13)	0.0221 (1.13)	0.0295 (1.48)
Bidders			-0.0162 (-1.55)	-0.0130 (-1.35)	-0.0130 (-1.35)	-0.0100 (-1.05)
Defence			-0.0139 (-0.64)	-0.0151 (-0.72)	-0.0151 (-0.72)	0.0012 (0.06)
Toehold			-0.0051 (-0.24)	-0.0113 (-0.54)	-0.0114 (-0.54)	-0.0042 (-0.18)
Hostile			0.0201 (0.90)	0.0125 (1.15)	0.0122 (1.18)	0.0102 (1.01)
Crisis period					0.0003 (0.03)	
Constant	-0.0113*** (-3.11)	0.0009 (0.05)	-0.0211* (-1.80)	-0.0012 (-0.06)	-0.0012 (-0.06)	-0.0158 (-0.73)
R-squared	0.0129	0.0704	0.0808	0.1061	0.1062	0.1633
R-adjusted	0.0114	0.0618	0.0640	0.0925	0.0935	0.1309
F-score	8.69	18.89	6.52	11.93	11.95	5.73
Year fixed effect	No	No	No	No	No	Yes
Observations	659	659	659	659	659	659

Sample B can be found in Table G1 (Appendix G), which uses the Z-score as distress measurement. The same findings are found as in sample A. The variable *Distress_Z* has a negative estimate of -0.0183 with a significance level of 1% in the first regression. In regression (4), where the firm and deal characteristics are added, there is still a significant negative relationship of the variable *Distress_Z* with the CAR (-1, +1) with a significance level of 5%. In regression (4), the acquirer's CAR is 1.45% lower when the target is distressed. This is consistent with the research of Ang and Mauck (2011) who found a significant negative effect of 3.20% with the Z-score method. The cause of a lower CAR according to them is that distressed firms are seen as companies with a discount due to their bad condition, however these discounts do not reflect real discounts that benefit an acquirer. As a result, an acquirer still pays too much for a distressed target, destroying its value. Ang and Mauck (2011) can confirm this assumption by using the 52-week highest stock price. Companies use the 52-week high as a measure of the actual value of a target. This psychological bias, according to Ang and Maud (2011), is especially prevalent with distressed targets. Bidders think they are getting a bargain compared to the 52-week high price, but the actual value of the distressed target is lower in the end. Meier and Servaes's (2020) study showed a significant positive effect, and they were unable to find a significant effect with the target Z-score. A reason for this could be that for the main study they used a different distressed measurement, in which they also included companies that were already bankrupt. Another reason is that their sample included both public and private targets, while this study focuses on only public firms, which may cause a difference in results.

To reject the null hypothesis of hypothesis 1, it must be found with certainty that a distressed

firm has a negative impact on the acquirer firm. The null hypothesis is rejected since both distressed measures give a significant negative effect. This implies that a distressed target has a significant negative relation with the CAR of the acquirer firm.

5.2 Business related

Now that a distressed acquisition has a negative impact on the acquirer's CAR, it is interesting to distinguish between different types of distressed acquisitions. Previous studies revealed that business-related acquisitions have a positive impact on both the target and the acquirer. Therefore, it could be that this type has a more positive effect than a business-unrelated distressed acquisition. The second hypothesis for this study is as follows:

Hypothesis 2: '*The abnormal return of the acquiring firm is higher in a business-related distressed acquisition than in a business-unrelated distressed acquisition.' (One-sided t-test)*

The business-relationship is tested through two dummies. The first dummy is *Industry_related*, in which the first 3 numbers of the SIC must match. The second dummy is called *Toehold*, in which a company already has shares in the target prior to the announcement date. The study shows that no significant findings were found for both dummies. There is no significant effect for either the whole sample or the divided sample into distressed and non-distressed targets and for both distress methods. As a result, it cannot be claimed with certainty that companies which are related to each other generate better performance after an acquisition. The null hypothesis cannot be rejected, implying that there is the possibility that CAR may also be lower if a business-related distressed acquisition occurs. One cause for these results is that business-related bidders assume that they can achieve more synergies and therefore bid higher than external bidders. Even if the acquirer business is related to the target, an acquisition remains a profoundly complicated phenomenon. This increases the risk that possible synergies will not be achieved due to complications, so that they end up overpaying for a target.

In addition, multicollinearity was also checked to examine whether the effect was accurate. Table J1 (Appendix J) shows a correlation matrix and it appears that no variables are highly correlated.

5.3 Acquirer's financial strength

Previous literature revealed that the financial power of an acquirer firm can be a determining factor in the success of an acquisition. Johnson and Abbott (1991) showed in their study that an acquirer firm must be financially strong enough to acquire a distressed public target. This is because an acquisition creates many costs, such as integration costs and investment costs of the target. It costs the acquirer even more if the target is distressed, since they must take over the debts. And the money can only be forthcoming from the acquirer firm since the target has a limited availability of slack. Therefore, the third hypothesis focuses on the financial power of the acquirer, which is formulated as follows:

Hypothesis 3: *'The acquiring firm's performance is positively related to the acquiring firm's financial strength in a distressed deal.' (One-sided t-test)*

First, the financial sustainability of a company is represented by its solvency ratio. This shows how many assets there are against debts. If a healthy business stops, the debts can be paid off by the assets. Table 6 shows that the solvency ratio of an acquirer taking over a distressed public target is on average higher than if it takes over a non-distressed public target. The distress measurement was utilized according to the ICR method Before the acquisition (*Solvency_before)*, the solvency ratio of a distressed public deal is 103.38% higher than a non-distressed public deal with significance level 1%. This is consistent with Johnson and Abott (1991) since firms that acquire distressed targets are financially stronger. Acquiring a distressed public target carries a greater risk since it has a lot of debt, requiring the acquirer to be financially strong. The median indicates that a smaller number of companies have a high solvency ratio which increases the average. However, the difference remains significant at level 1% when the solvency ratio is winsorized at 5%. After the acquisition (*Solvency_after*), the averages of both groups decreased, but the difference between the groups remained significantly the same. For both groups, after the acquisition, the acquirer firms remain healthy according to the solvency ratio, which is above 100% as shown by to Brîndescu-Olariu (2016). In addition, the Z method was also used for the distress measurement and no different results were obtained from this. No significant effect was found when controlling for firm- and transaction characteristics. Consequently, it is not possible to determine the influence of the solvency ratio on CAR.

Table 6: Mean difference Solvency; Distressed public targets

Notes. This table shows the solvency ratio of the acquirer firm before and after the acquisition. *Solvency_before* is the solvency ratio of a fiscal year prior to the acquisition. *Solvency_after* shows the ratio of the fiscal year after the acquisition. The sample is divided by the Interest Coverage Ratio (ICR). A target falls under distress if it has an ICR value below 1 for 2 years before the announcement date. There are 152 targets public distressed and 491 targets public non-distressed. The values *, ** and *** denote the significance levels of 0.10, 0.05 and 0.01.

Column1	Distress(1)	Column2	Non-distress(2)	Column3	Differences (2)-(1)	Column4
	Mean	*Median*	*Mean*	*Median*	*Mean*	*P-value*
Solvency_before	2.2689	1.3826	1.2352	0.8011	-1.0338***	0.0000
Solvency_after	1.7454	1.2132	1.0317	0.6768	-0.7137***	0.0000
Observations	152		491			

Table 7 contains the regressions to continue testing hypothesis 3. Sample A is used in this model, where the ICR is thus applied to measure distress. Regression (1) is a simple test that considers whether the profitability of an acquirer influences the CAR. It shows that *Profitability* has a significant positive effect on *CAR (-1, +1)* with significance level 1%. This means that the financially stronger the acquirer

is, the better the performance after a deal announcement. This may indicate that shareholders are confident that a profitable company has a greater chance of success if it acquires a target. To ensure that the effect is reliable, control variables are added in regression (2). When the firm and deal characteristics are added, the variable *Profitability* is somewhat less significant, but still retains a positive relationship at significance level 10%. To test whether there is a positive relationship within distressed deals, a dummy is created, namely *(Distress*Profitability)*. *Distress* is given the value 1 if it has an ICR score lower than 1. Regression (3) shows that the dummy has no significant effect on CAR (-1, +1), so it is not stated that a financially strong acquirer achieves better results in a distressed acquisition. To ensure that this is not the case, the sample is split in regression (4). In (4), only the distressed deals are included in the regression. The result is that there is again not a significant effect found from *Profitability*.

Since there is a risk that an acquirer firm will be taken into bankruptcy by a distressed target, its relative size is also a determinant of financial power. The smaller the target is in size relative to the acquirer, the less likely an acquirer is to be financially at risk after an acquisition. In addition, a smaller target is relatively more feasible to adopt, as there are fewer integration complications (Al-Sharkas & Hassan, 2010). For this reason, regressions (5) and (6) test for *Relative size*. Regression (5) shows a simple test using an interaction dummy, namely *(Distress*Relative_size).* This examines whether there is a significant effect within the distressed deals. It resulted in a significant negative effect on CAR. *Relative_size* is a ratio where the total assets of the target are divided by the total assets of the acquirer. The larger the value of the ratio, the smaller the difference with the acquirer size becomes. Thus, a significant negative effect of -8.31% at significance level 5% shows that the smaller the value *Relative_size* becomes, the larger the CAR increases. This is consistent with our expectation, since a relatively small, distressed target is a lower risk for the acquirer firm. Regression (6) controls the interaction dummy (*Distress*Relative_size)* for firm and deal characteristics. The result is that there is still a negative effect compared to CAR with a significance level of 10%.

In short, it cannot be established with certainty that the solvency and profitability of the acquirer have a positive effect on CAR, but rather that the relative size determines the level of CAR. Since the solvency and profitability show no significant effect, it is not possible to reject the null hypothesis. However, what can be determined is that is that financial power in absolute terms is indeed a determining factor. A relatively smaller target relative to the acquirer provides a significantly more positive CAR, which is consistent with the findings of Johnson and Abbott (1991) and Sharkas and Hassan (2010).

Table 7: Regression hypothesis 3; Financially strength

Notes. An OLS regression is performed on the sample of total 659 deals over a period of 2000-2020, with 158 public deals distressed. The dependent variable is the acquirers' CAR over window -1 to +1, with day 0 as the announcement date. A target falls under distress if it has an ICR value below 1 for 2 years before the announcement date. Regression (1), (2) and (3) focus on the profitability of the acquirer. Regression (4) considers only the distressed group of 158 deals, using the ICR method. Finally, (5) and (6) focus on the relative size between the

target and the acquirer firm. The T-value is shown between parentheses. The values *, ** and *** denote the significance levels of 0.10, 0.05 and 0.01. The regressions were all run with robust standard errors. The definitions of the variables can be found in Table 2 in the methodology section. The year fixed effect is not shown in the table but are included in regression (6). Finally, the ratios are winsorized at 1%.

Variables	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
Profitability	0.0909*** (2.71)	0.0558* (1.92)		-0.0317 (-0.52)		
(Distress*Profitability)			-0.0003 (-0.01)			
Relative_size		-0.0217*** (-2.71)		-0.0418 (-0.75)		
(Distress*Relative_size)					-0.0831** (-2.55)	-0.0611* (-1.68)
Total_Assets_TA		-0,0001 (-0.01)		-0.0063 (-1.11)		-0.0032* (-1.68)
Total_Assets_Acq		-0,0020 (-0.78)		0.0082 (1.63)		0.0003 (0.11)
Q_Ta		0.0001 (0.02)		-0.0001* (-1.89)		-0.0001* (-1.74)
Q_Acq		-0.0020 (-2.46)		-0.0014 (-1.15)		-0.0022 (-1.27)
Cash payment		0.0203 (1.16)		0.0172 (0.34)		0.0195 (0.99)
Bidders		-0.0146 (-1.32)		0.0151 (1.15)		-0.0206* (-1.85)
Defence		-0.0235 (-1.26)		-0.0738 (-0.90)		-0.0224 (-1.01)
Toehold		-0.0177 (-0.78)		-0.0535 (1.37)		-0.0188 (-0.81)
Hostile		0.0218 (1.41)		0.0245 (0.64)		0.0227* (1.74)
Constant	-0.0294*** (-4.62)	-0.0029 (-0.15)	-0.0165*** (-4.83)	-0.0693** (-2.16)	-0.0122*** (-3.81)	0.0081 (0.41)
R-squared	0.0153	0.1043	0.0019	0.1953	0.0379	0.1078
R-adjusted	0.0138	0.0832	0.0001	0.1141	0.0365	0.0866
F-score	7.34	9.59	0.01	6.63	6.49	10.30
Observations	659	659	659	158	659	659

5.4 Syndicated loan

In addition to the financial strength of an acquirer, the method of financing is featured as well. The way of financing gives signals to the shareholders, which can influence the CAR. Since large banks are often involved in a syndicated loan, the acquirer and the target are fully vetted through a due diligence process which reduces information asymmetry. This reduces the risk that the deal could be a financial flop because decisive information was hidden. The hypothesis for this study is as follows:

Hypothesis 4: *'The performance of the acquiring firm will be higher when the distressed deal is financed by a syndicated loan.' (One-sided t-test)*

To test this hypothesis, six regressions are used in Table 8. Regression (1) has the ratio *Syndicated_loan* as the independent variable and the CAR as the dependent variable. A significant positive relationship is found with significance level 1%, which is consistent with expectations that a syndicated loan provides a higher CAR around the effective date. The coefficient is small, at 0.13%, but significantly positive. One explanation, according to Li et al. (2015), is that the screening and monitoring process in a syndicated loan is of high quality, therefore having a positive effect on the post-merger performance. Regression (2) controlled for firm and deal characteristics, after which the *Syndicated_loan* is still significant at significance level 5%. In regression (3), the distress dummy is added, but this gives no difference to the effect. To see if syndicated loans have a positive effect on a distressed deal, a dummy, namely *(Distress*Syndicated)*, is created for regression (4), which only includes the syndicated loans from a distressed acquisition. The result is that if a deal is financed by a syndicated deal there is a significant positive effect on the CAR of the acquirer firm with significance level 1%. This effect remains the same when control variables are included in the regressions of (5) and (6). Although the coefficient is not very large for the last regressions, at 0.11%, it is still interesting from a shareholder perspective. After all, shareholders already benefit from a minimal increase in the stock price. The null hypothesis is rejected, as there is a significant positive effect of using syndicated loans to finance a distressed deal on an acquirer's CAR.

Table 8: Regression hypothesis 4; Syndicated loans

Notes. An OLS regression is performed on the sample of total 659 public deals over a period of 2000-2020, with 158 public deals distressed. The dependent variable is the acquirers' CAR over window -1 to +1, with day 0 as the effective date. A target falls under distress if it has an ICR value below 1 for 2 years before the announcement date. Regression (1), (2), and (3) look at the effect on the entire sample. Regression (4), (5), and (6) focus on the effect within the distressed deals. In addition, a dummy is created that includes distressed deals that used a syndicated loan for financing (Distress*Syndicated). The T-value is shown between parentheses. The values *, ** and *** denote the significance levels of 0.10, 0.05 and 0.01. The regressions were all run with robust standard errors. The definitions of the variables can be found in Table 2 in the methodology section. Finally, the ratios are winsorized at 1%

Variables	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
Syndicated_loan	0.0013*** (2.86)	0.0011** (2.39)	0.0015** (2.06)			
Distress_ICR			-0.0258*** (-3.08)			-0.0266*** (-3.17)
(Distress*Syndicated)				0.0010*** (6.50)	0.0010*** (2.63)	0.0011*** (2.91)
Relative_size		-0.0225 (-1.22)	-0.0213 (-1.10)		-0.0223 (-1.21)	-0.0213 (-1.10)
Total_Assets_TA		0.0001 (0.00)	-0.0028 (-0.73)		-0.0002 (-0.05)	-0.0030 (-0.77)
Total_Assets_Acq		-0.0014 (-0.45)	-0.0006 (-0.17)		-0.0022 (-0.42)	-0.0005 (-0.16)
Q_Ta		-0.0001 (-0.48)	-0.0001 (-0.37)		-0.0001 (-0.55)	-0.0001 (-0.40)

Q_Acq		-0.0022 (-1.55)	-0.0020 (-1.46)		-0.0022 (-1.56)	-0.0020 (-1.46)
Cash payment		0.0152 (0.73)	0.0152 (0.74)		0.0165 (0.79)	0.0165 (0.80)
Bidders		-0.0146 (-1.35)	-0.0147 (-1.35)		-0.0145 (-1.34)	-0.0146 (-1.34)
Defence		-0.0233 (-0.99)	-0.0248 (1.09)		-0.0236 (-1.00)	-0.0250 (-1.10)
Toehold		-0.0336* (-1.65)	-0.0325* (-1.68)		-0.0342* (-1.68)	-0.0328* (-1.70)
Hostile		0.0173 (1.17)	0.0169 (1.16)		0.0174 (1.17)	0.0169 (1.16)
Constant	-0.0172*** (-5.38)	0.0018 (0.08)	0.0186 (0.83)	-0.0167*** (-5.23)	0.0023 (0.10)	0.0197 (0.88)
R-squared	0.0051	0.0969	0.1117	0.0011	0.0946	0.1102
R-adjusted	0.0036	0.0801	0.0937	0.0021	0.0778	0.0922
F-score	8.17	11.32	11.62	7.31	11.98	11.85
Observations	659	659	659	659	659	659

5.5 Distress versus Chapter-11

This study not only focuses on distressed firms, but also focusses on Chapter 11 bankrupt firms. Assuming that a bankrupt firm has a weaker position during price negotiations, an acquirer is expected to achieve a higher return when acquiring Chapter-11 firm (Meier & Servaes, 2020). To examine whether an acquirer firm's stock price responds to a bankrupt target relative to a distressed target, the following hypothesis is used:

Hypothesis 5: *'The performance of the acquiring firm will be higher when it takes over a Chapter 11-bankrupt target firm compared to a distressed target firm.' (One-sided t-test)*

First, to examine this hypothesis, a t-test is conducted between different samples, which provides a distinct view on the performance of bankrupt deals. A dummy is created, namely *Bankrupt*, where it gets the value '1' if the target is declared bankrupt before the deal is announced and '0' if it is not the case. Table H1 (Appendix H) shows a sample of public acquirer firms taking over a private or a public target firm. As there are only 41 public target bankrupts, the survey is supplemented with private targets. The period for this sample and the CAR parameters is consistent with the rest of the study. Table H1 has 123 bankrupt targets and 13,474 non-bankrupt targets. The result shows that bankrupt deals provide a positive average CAR (-1, +1) of 2.19%, while non-bankrupt firms have an average of 0.73%. The differences between the two groups is significant at a window of -1 to +1 with 1.46% at significance level 5%. This result remains the same when other windows are used. Table H2.1 (Appendix H) displays only the private target deals. No significant difference is found between the bankrupt private group and the non-bankrupt private group. What can be noticed is that the bankrupt private group has a higher mean and median compared to the non-bankrupt private group. In Table H3.1 (Appendix H), the main sample is used from previous sections (Sample A), where the targets are public as well, which is

supplemented with bankrupt public targets. The bankrupt public targets meet the same criteria as the ordinary targets. In this sample it becomes clear that bankrupt deals generate a positive result of 2.97% for the acquirer compared to a non-bankrupt deal with a negative result of -1.65%. The two groups differ significantly from each other with significance level 1%, so it can be said with certainty that a bankrupt public deal produces better stock results for the acquirer than the total sample. Figure H2.2 and H3.2 (Appendix H) show the distribution of CAR(-1, +1) through a boxplot. Figure H2.2 shows that the non-bankrupted private targets have a few outliers on the positive side of the distribution, only the CAR is not greater than 15%, so they were chosen to be included. The same is true for Figure H3.2, where outliers can be found among bankrupt private targets and non-bankrupt private targets. By including the outliers, the results are more realistic. To focus on bankruptcy and financial distress, Table H4 (Appendix H) zooms in on public targets that meet one of these criteria. The ICR method is used to define a distressed firm. The result shows that a bankrupt public target causes a positive CAR (-1, +1) of 2.97% on average, while a distressed target has a negative mean of -3.3%. With a difference in mean of 6.27%, the two groups differ significantly from each other with significance level 1%.

In Appendix I, a distinction is made between target size and industry. Table I1 (Appendix I) shows the public bankrupt firms. Deals in manufacturing and the service industry provide positive CAR. A large difference is between the small and large firms in the mining industry, since there are only 4 observations in this industry it is difficult to give an explanation. Table I2 (Appendix I) displays the public distressed firms. It is clear that in all industries, where a distressed deal is observed, it creates a negative impact on the acquirer's CAR. Thus, the difference in industry has no effect for the public distressed firms, as the effect is approximately the same.

To give more robustness to the test, an OLS regression is performed on the different samples in Table 9. Since the bankrupt deals contained various missing values only the deal characteristics were included in the regression as control variables. In all regressions of this model, the variable *Bankrupt* has a significant positive coefficient at significance level 1%. This is in line with Meier and Servaes (2020) who showed that fire sales result in about 2% higher stock price of the acquirer firm. However, a reason for doing so is that the bargaining power of a bankrupt target is less strong, resulting in a lower premium, which is beneficial to the acquirer. Regression (1) has as sample private and public targets, while (2) and (3) focus on the main sample with only public firms. Bankrupt deals are positively related to CAR (-1, +1) for both public deals and private deals. In regression (3), the variable *Distress_ICR* is also added, to examine whether the effect remains the same. Herein, a distressed deal has significant negative relationship with the CAR of an acquirer, while a bankrupt deal has a significant positive effect. Regression (4) contains only distressed and bankrupt deals, in which it can also be seen that a bankrupt deal has a positive effect on *CAR* with a coefficient of 6.6%. This rejects the null hypothesis, since a bankrupt deal, which is in Chapter 11, generates a higher stock price at the acquirer firm than a distressed deal.

Table 9: Regression hypothesis 5; Bankrupt targets versus distressed targets (public and private)

Notes. An OLS regression is performed on the samples over a period of 2000-2020. The dependent variable is the acquirers' CAR over window -1 to +1, with day 0 as the announcement date. Regression (1) represents the sample in which U.S. private and public targets are presented. A distinction is made between bankrupt firms, which are in Chapter 11. Regressions (2) and (3) included only public firms. The public firms that are bankrupt are found through the Thompson One database and complemented by the UCLA-LoPucki Bankruptcy Research Database. Regression (4) includes only the public bankrupt deals and the distressed deals. A target falls under distress if it has an ICR value below 1 for 2 years before the announcement date. The T-value is shown between parentheses. The values *, ** and *** denote the significance levels of 0.10, 0.05 and 0.01. The regressions were all run with robust standard errors. The definitions of the variables can be found in Table 2 in the methodology section. Finally, the ratios are winsorized at 1%.

Variables	*(1)*	*(2)*	*(3)*	*(4)*
Bankrupt	0.0156*** (2.84)	0.0543*** (3.79)	0.0491*** (3.41)	0.0660*** (4.33)
Distress_ICR			-0.0203*** (-2.83)	
Cash_payment	0.0058*** (3.97)	0.0370*** (5.20)	0.0362*** (5.10)	0.0205 (1.59)
Bidders	-0.0196*** (-3.11)	-0.0221* (-1.65)	-0.0228* (-1.68)	0.0102 (1.18)
Defence	-0.0315*** (-3.15)	-0.0220 (-0.95)	-0.0222 (-0.98)	-0.0682 (-0.95)
Toehold	-0.0080 (-1.64)	-0.0149 (-0.73)	-0.0119 (-0.59)	0.0093 0.25)
Hostile	0.0104 (1.34)	0.0174 (1.14)	0.0155 (1.01)	-0.0272 (-0.92)
Constant	0.0247*** (3.86)	-0.0148 (-1.04)	-0.0086 (-0.59)	-0.0529*** (-3.61)
R-squared	0.0027	0.0634	0.0737	0.1203
R-adjusted	0.0023	0.0552	0.0648	0.0928
F-score	7.65	6.29	7.60	4.22
Observations	13656	700	700	199

5.6 Long-term effects

To examine the long-term effects of an acquisition, the BHAR is studied. The BHAR is a measurement tool that is needed to answer the following hypothesis:

Hypothesis 6A: '*Acquiring a distressed public target has a positive/negative effect on the long-term performance of the acquirer firm.' (Two-side t-test)*

Hypothesis 6B: '*Acquiring a bankrupt public target has a positive/negative effect on the long-term performance of the acquirer firm.' (Two-side t-test)*

Panel A of Table 10 shows the distinguishing between distressed and non-distressed public targets. The BHAR has an event window of 12 months after the announcement period. The distressed deals have an average BHAR of -3.72% and a median of -7.75%. This means that a few companies have a more positive BHAR, making it a few percent higher on average. Overall, the distressed target has a negative impact on the acquirers' stock price. The non-distressed group have an average of 1.92% and a median of -0.66%. This shows that this group has a more positive impact on the acquirer firm, although at least 50% of the firms have a negative BHAR. There is a difference between the groups of 5.64% which is significant at a level of 10%. Panel B focuses on the BHAR of the acquirer after taking over a bankrupt. The bankrupt targets cause an average BHAR of -0.36%, while the average of the non-bankrupt group sits at 0.72%. This is a very small difference, making the groups not significantly different from each other.

Table 10: Mean difference BHAR

Notes. The buy-and-hold abnormal return (BHAR) has a window of 1 year. In addition, a value-weighted benchmark is used for the portfolio returns, and this long-run event study is accessed by the WRDS database. The sample of Panel A is divided by the Interest Coverage Ratio (ICR). A target falls under distress if it has an ICR value below 1 for 2 years before the announcement date. There are 149 public targets distressed and 514 public targets non-distressed. The acquirer and target are both public and from the United States. Panel B distinguishes between bankrupt public deals and non-bankrupt public deals. The public firms that are bankrupt are found through the Thompson One database and complemented by the UCLA-LoPucki Bankruptcy Research Database. A T-test is performed for the differences between the groups. The P-value is based on the difference between the mean of the groups. The values *, ** and *** denote the significance levels of 0.10, 0.05 and 0.01. Finally, the ratios are winsorized at 1%.

Panel A:Distressed public and non-distressed public targets

Column1	Distress	Column2	Non-distress	Column3	Diff.	Column4
	Mean	*Median*	*Mean*	*Median*	*Mean*	*P-value*
BHAR	-0.0372	-0.0775	0.0192	-0.0066	0.0564*	0.0795
Observations	149		514			

Panel B: Bankrupt public and non-bankrupt public targets

Column1	Bankrupt	Column2	Non-bankrupt	Column3	Diff.	Column4
	Mean	*Median*	*Mean*	*Median*	*Mean*	*P-value*
BHAR	-0.0036	-0.0194	0.0072	-0.0179	0.0108	0.8519
Observations	38		625			

Table 11 shows the regressions performed for hypotheses 6A and 6B. Regressions (1) and (2) are focused on the distressed public deals, and regressions (3) and (4) on bankrupt deals. Regression (1) shows a simple regression in which *Distress_ICR* has a negative effect on the BHAR with a coefficient of -0.0582. It is a significant effect with significance level 10%. To give more strength to the regression,

firm and deal characteristics are added in regression (2). This results in an insignificant effect of the *Distressed_ICR*, so it cannot be determined whether a distressed deal causes a negative or positive effect on the acquirers' BHAR. Regression (3) shows a simple regression with only *Bankruptcy* as the independent variable and in (4) the deal characteristics are added as control variables. Both regressions show that the variable *Bankrupt* has no significant effect on the BHAR. In summary, there is minimal evidence for hypothesis 6A that a distressed deal causes a negative impact on the acquirer's BHAR. When the regression is expanded to include control variables, there is no longer a significant effect. As a result, hypothesis 6A cannot be rejected. This also applies to hypothesis 6B since no significant effect is found in the regressions. This result is consistent with the findings of Bouwman et al. (2009) and Ang and Mauck (2011). One explanation is that the long-run effect of an acquisition is difficult to measure, as many external factors can affect the share price, and this effect is enhanced as the window widens.

Table 11: Regression hypothesis 6; BHAR

Notes. An OLS regression is performed on the samples over a period of 2000-2020. The dependent variable is the BHAR. Regressions (1) en (2) represents public distressed and non-distressed public deals. A target falls under distress if it has an ICR value below 1 for 2 years before the announcement date. In regression (3) and (4) bankrupt public deals are added to the sample. The public firms that are bankrupt are found through the Thompson One database and complemented by the UCLA-LoPucki Bankruptcy Research Database. The T-value is shown between parentheses. The values *, ** and *** denote the significance levels of 0.10, 0.05 and 0.01. The regressions were all run with robust standard errors. The definitions of the variables can be found in Table 2 in the methodology section. Finally, the ratios are winsorized at 1%.

Variables	*(1)*	*(2)*	*(3)*	*(4)*
Distress_ICR	-0.0582* (-1.65)	-0.0565 (-1.47)		
Bankrupt			-0.0108 (-0.17)	0.0018 (0.03)
Total_Assets_TA		-0.0219** (-2.02)		
Total_Assets_Acq		0.0270** (2.28)		
Relative size		0.1061*** (2.60)		
Q_Ta		-0.0152 (-1.31)		
Q_Acq		0.0074 (0.80)		
Cash payment		0.0589* (1.67)		0.0593* (1.83)
Bidders		0.0057 (0.10)		0.0332 (0.60)
Defence		-0.1493** (-2.25)		-0.1435** (-2.20)
Toehold		0.1206 (0.71)		0.1613 (1.09)
Hostile		0.1478* (1.71)		0.1216 (1.48)

Crisis_period		-0.0042 (-0.10)		-0.0709 (-0.15)
Constant	0.0210 (1.41)	-0.1468 (-1.60)	0.0072 (0.52)	-0.0702 (-1.13)
R-squared	0.0052	0.0493	0.0011	0.0253
R-adjusted	0.0036	0.0322	0.0012	0.0152
F-score	3.72	4.77	2.03	3.62
Observations	625	625	663	663

6 Conclusion

6.1 Summary results

The purpose of this thesis was to provide a distinct understanding of what the effect of distressed and bankrupt acquisitions on acquirer performance is. This was examined by the following research question: '*To what extent are acquiring financially distressed and bankrupt companies valuable to the shareholders of the acquiring company?*' The first hypothesis examined whether a distressed target has a positive or negative effect on the acquirer's CAR. Two methods were used to examine distress. The interest coverage ratio (ICR) method and the Z-score method were used. This created two different samples in which a distinction was made between distressed public targets and non-distressed public targets, and a distinction was made between distressed private targets and non-distressed private targets. The results revealed that in both public samples the distressed targets caused a significantly negative CAR(-1, +1) for the acquirer of -3.30% (ICR) and -3.41% (Z-score), as can been seen in Table 12. When sample A, using the ICR method, and sample B, using the Z-score method, were controlled for firm- and deal characteristics, distressed deals remained significantly negative relating to the acquirer's CAR. These results were consistent with the findings of Clark and Ofek (1994) and Ang and Mauck (2011) who also showed a significant negative effect of distressed targets with the acquirer's CAR. A motive for doing so could be that distressed firms are paid an excessively high premium since the true value of a distressed target is difficult to estimate. In contrast, Meier and Servaes (2020) found a significant positive effect, only this may be because a more stringent method is used for financially distressed firms. The difference was not found to be as strong among the private targets. Only with the Z-score method private distressed targets caused the CAR to decrease -1.24% on average, which was significantly lower than the private non-distressed targets.

Next, the study examined whether there was a difference in types of distressed targets. The second hypothesis assumed that business-related distressed acquisitions cause a higher acquirer's CAR than business-unrelated distressed acquisitions. Bruton et al. (1994) showed that distressed targets cause a positive performance for the acquirer if it is a business-related acquisition. Fowler and Schmidt (1989) and Servaes (1991) reached the same findings, explaining that potential synergies are greater when the target firm and the acquirer firm belong to the same industry. However, no significant effect was found in the sample of this study. One of the reasons for these results to occur could have been that an acquiring company assumes it can realize more synergies and therefore overbids compared to an outside bidder. As a result, it overestimates the potential value of the target, which ultimately causes the acquirer firm to overpay for a target.

The third hypothesis examines whether the acquirer's financial health positively affects its CAR after an acquisition announcement of a distressed public firm. Indeed, Johnson and Abbott (1991) found that it is important for an acquirer to be financially strong because a lot of slack is needed for a target in trouble to become financially healthy again. The Financial strength of a company is measured in this

study by the insolvency ratio, the profitability ratio and by the relative size between the target and the acquirer. The size of the firm in relation to the distressed target provides financial power as well, which reduces the risk that a distressed target will take the acquirer with it in its fall (Clark & Ofek, 1994). It was revealed that the acquirer's insolvency ratio for an acquisition of the distressed public targets has a significantly 103.38% higher average than non-distressed public targets. Which may indicate that only financially strong companies will take the risk of acquiring a distressed public target. Further, there was no significant effect found for the acquirer profitability in this study, but there was a significant negative effect found for the relative size with the acquirer's CAR. The greater the value of the relative size ratio, the more narrow the differences with the size of the acquirer becomes. As a result, a significant negative relationship with CAR is consistent with the expectations, a relatively small distressed target represents a lower risk to the acquiring company. The effects of the popular M&A financing method, named syndicated loans, was examined as well. The fourth hypothesis examined whether the use of a syndicated loan as financing is positively related to the acquirer's CAR. The results revealed that the use of this financing method has a positive effect on the acquirer's CAR. According to Li et al. (2015) this happens because the screening and monitoring process in a syndicated loan is of high quality, so it sends a positive signal regarding trust to the shareholders of the acquirer firms.

In addition when examining distressed public targets, this thesis researched the distinction between distressed and bankrupt targets, which were located in Chapter 11. Hypothesis 5 assumed that the acquirer's CAR is higher in bankrupted acquisitions compared to distressed acquisitions. The results revealed that bankrupt public targets caused a significant positive acquirer's CAR (-1, +1) with a mean of 2.97%. This is a significant difference from the distressed public targets of 6.27%. It can be concluded that bankrupt public targets are more beneficial for the acquirer short-term performance compared to distressed public targets and even lead to a positive CAR. This result is consistent with the findings of Amit et al. (1989) and Meier and Servaes (2020) who show that a lower premium is paid for a bankrupted target and therefore there is a weak bargaining position for the bankrupt target. Furthermore, the Chapter 11 reorganization process causes the true value of the bankrupt target to emerge, reducing the uncertainty of the bid. Last, the debt repayment conditions were also less strict, since the reorganization plan has created new debt conditions, resulting in favorable interest rates after the acquisition.

The last hypothesis examined the long-term effects of distressed and bankrupt public targets using the BHAR method. However, like the studies of Bouwman et al. (2009) and Ang and Mauck (2011), no significant effects was found, so it could not be determined how the distressed or bankrupt public target affects the long-term performance of the acquirer.

The final answer to the research question is that, on the one hand, public distressed targets have a negative effect on the short-term stock price of the acquirer's shareholders. On the other hand, public bankrupted targets have a positive effect on the short-term stock price. It is uncertain what effect private distressed and bankrupt targets have on the acquirer's stock price. Moreover, the long-term effects are also uncertain.

Table 12: Summary results; CAR

CAR (-1,+1)			CAR (-1,+1)	Diff.	P-value
Public distressed (ICR)	-0.0330	Public non-distressed (ICR)	-0.0113	0.0217***	0.0035
Public distressed(Z)	-0.0341	Public non-distressed(Z)	-0.0158	0.0183**	0.0168
Private distressed (ICR)	-0.0138	Private non-distressed (ICR)	-0.0092	0.0046	0.4580
Private distressed (Z)	-0.0124	Private non-distressed (Z)	0.0006	0.0130*	0.0967
Public bankrupt	0.0297	Public non-bankrupt	-0.0165	-0.0463***	0.0005
Private bankrupt	0.0270	Private non-bankrupt	0.0085	-0.0236	0.1384

6.2 Limitations & future research

The research conducted while investigating this thesis does contain some limitations. At first, a measurement error might occur because there may be discrepancy between the actual variable of interest and the proxy used to express it in this research. It could be that the ICR and Z-score methods give skewed measurements of distress. By applying two methods as a proxy for distress, the changes of measurement errors are fairly reduced but there may still be a discrepancy. In addition, the dependent variable CAR can contain a measurement error since external factors can have an effect on the stock price. This was carefully taken into account by focusing on a small window of (-1, +1) and using the 3-factor model (Fama & French, 1995) to give an accurate prediction of the abnormal values. A Second limitation of this research may be that simultaneity bias can arise in the regression study. In which it is uncertain what the cause and effect is. However, this is avoided since the variables are measured prior to the acquisition and the dependent variable *CAR* is therefore always measured later in the time frame, making the cause and effect more clear. Subsequently, *CAR* is used as a term for short-term performance throughout the entire thesis. Since a CAR can be influenced by external factors, it is necessary for future research to measure short-term performance in multiple ways. This can for example be done by using an accounting approach. Thirdly, multicollinearity is a bias in which two or more variables are too strongly correlated in a regression. This can influence the coefficients of the variables, making the results inaccurate. Table J1 (Appendix J) shows that the variables are not strongly correlated, which makes the regressions reliable. Furthermore, the results of this study are only grounded for companies located in the US. This is because bankruptcy laws and policies vary between countries. Finally, regressions with the dependent variable *CAR* included outliers. Outliers can cause the mean to be strongly influenced, resulting in skewed results. However, it was decided to winsorize to a minimum of 1%, since the outliers were not unrealistic. This prevents a distorted representation of the data, compared to eliminating all outliers. This was a broad study of distressed and bankruptcy deals in the US. In the future, it is worth zooming in on distressed and bankruptcy waves, such as the corona crisis. Moreover, it is interesting for shareholders to know the differences in effect between European and US bankruptcies.

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Appendices

Appendix A

Table A1: Variable descriptions

Variable	Description
Dependent variable	
CAR	The cumulative abnormal return is the sum of the difference between the actual return minus the expected return.
BHAR	The BHAR is calculated by subtracting the expected buy-and-hold return from the realized buy-and-hold return.
Independent variable	
Financial distress	
Distress_ICR	The dummy is given the value 1 if the target scores lower than 1 on the interest coverage ratio and the value 0 if it is equal to 1 or higher. The EBITDA, interest expense and long term debt were retrieved from the Compustat Capital IQ (WRDS) database.
Distress_Z	The dummy is given the value 1 if the target scores lower than 1.8 on the Z-score and the value 0 if it is equal to 1.8 or higher. The financial ratios were retrieved from the Compustat Capital IQ (WRDS) database.
Bankrupt	The dummy is given the value 1 if the target filed for bankruptcy (chapter 11) and the value 0 if the target has not been declared bankrupt. The financial information is retrieved from the Thompson One database.
Business Related	
Industry_related	The dummy is given the value 1 if the target matches the acquirer with the first 3 digits of the SIC code and is given the value 0 if less than 3 digits are the same. The industry information is retrieved from the Thompson One database.
Toehold	The dummy is given the value 1 if the acquirer has shares in the target prior to the announcement date and is given the value 0 if the acquirer had no shares in the target. The financial information is retrieved from the Thompson One database.
Financial strength	
Solvency_before	The solvency ratio is calculated by dividing the total equity by the total liabilities in the fiscal year prior to the acquisition. The total equity and total liabilities of the acquirer firms were retrieved from the Compustat Capital IQ (WRDS) database.
Solvency_after	The solvency ratio is calculated by dividing the total equity by the total liabilities in the fiscal year after the acquisition. The total equity and total liabilities of the acquirer firm were retrieved from the Compustat Capital IQ (WRDS) database.
Profitability	The ratio to measure the profitability of acquirer firms consists of EBITDA divided by Total Assets prior to the announcement date. The financial ratio is retrieved from the Compustat Capital IQ (WRDS) database.
Relative_size	It is calculated by dividing the Total Assets of the target by the Total Assets of the Acquirer prior to the announcement date. The financial information is retrieved from the Thompson One database.
Financing	
Syndicated_loan	The amount of syndicated loans is divided by the deal value to give an indication of the amount of external debt used for the acquisition. The financial information is retrieved from the Thompson One database.
Control variable	
Firm characteristics	
Firm_size_Ta	This is the logarithm of target's Total Assets divided by that year's CPI index, so inflation is included. The financial information is retrieved from the Thompson One database.
Firm_size_Acq	This is the logarithm of acquirer's Total Assets divided by that year's CPI index, so inflation is included. The financial information is retrieved from the Thompson One database.

Q_Ta	The Tobin's Q is a ratio comparing the target's market value to total assets. The financial information is retrieved from the Thompson One database.
Q_Acq	The Tobin's Q is a ratio comparing the acquirer's market value to total assets. The financial information is retrieved from the Thompson One database.
Crisis_period	The dummy gets the value 1 if the deal takes place during the financial crisis (2008-2011) and the value 0 if the deal falls outside it. The information is retrieved from the Thompson One database.
Deal characteristics	
Cash payment	The dummy gets the value 1 if the target is paid with 51% cash or more and gets the value 0 if it is equal to 50% or lower. The financial information is retrieved from the Thompson One database.
Bidders	Indicates how many companies have bid on the target (number of bidders). The financial information is retrieved from the Thompson One database.
Defence	The dummy is given the value 1 if the target had defence methods to prevent a takeover and is given the value 0 if it did not. The financial information is retrieved from the Thompson One database.
Toehold	The dummy is given the value 1 if the acquirer has shares in the target prior to the announcement date and is given the value 0 if the acquirer had no shares in the target. The financial information is retrieved from the Thompson One database.
Hostile	The dummy is given the value 1 if the target was acquired by hostile-method and is given the value 0 if it was not. The financial information is retrieved from the Thompson One database.

Appendix B: Number of deals by Year

Table B1: ICR-sample

Year	Non-distressed	%	Distressed	%
2000	50	9.98%	15	9.49%
2001	39	7.78%	19	12.03%
2002	23	4.59%	8	5.06%
2003	21	4.19%	10	6.33%
2004	27	5.39%	7	4.43%
2005	34	6.79%	11	6.96%
2006	27	5.39%	8	5.06%
2007	41	8.18%	6	3.80%
2008	14	2.79%	14	8.86%
2009	25	4.99%	6	3.80%
2010	23	4.59%	8	5.06%
2011	15	2.99%	3	1.90%
2012	29	5.79%	2	1.27%
2013	17	3.39%	5	3.16%
2014	21	4.19%	10	6.33%
2015	33	6.59%	6	3.80%
2016	3	0.60%	1	0.63%
2017	19	3.79%	6	3.80%
2018	24	4.79%	4	2.53%
2019	12	2.40%	7	4.43%
2020	4	0.80%	2	1.27%
Total	**501**		**158**	

Table B2: Z-score sample

Year	Non-distressed	%	Distressed	%
2000	50	11.47%	7	4.52%
2001	38	8.72%	15	9.68%
2002	24	5.50%	4	2.58%
2003	18	4.13%	10	6.45%
2004	23	5.28%	5	3.23%
2005	30	6.88%	8	5.16%
2006	27	6.19%	5	3.23%
2007	38	8.72%	6	3.87%
2008	17	3.90%	9	5.81%
2009	15	3.44%	13	8.39%
2010	21	4.82%	9	5.81%
2011	10	2.29%	7	4.52%
2012	19	4.36%	8	5.16%
2013	16	3.67%	3	1.94%
2014	20	4.59%	9	5.81%
2015	25	5.73%	9	5.81%
2016	2	0.46%	2	1.29%
2017	16	3.67%	7	4.52%
2018	17	3.90%	8	5.16%
2019	8	1.83%	7	4.52%
2020	2	0.46%	4	2.58%
Total	**436**		**155**	

Table B3: Bankrupt sample

Year	Bankrupt	%
2000	3	7,32%
2001	8	19,51%
2002	5	12,20%
2003	2	4,88%
2004	3	7,32%
2005	1	2,44%
2006	0	0,00%
2007	3	7,32%
2008	0	0,00%
2009	1	2,44%
2010	2	4,88%
2011	1	2,44%
2012	0	0,00%
2013	1	2,44%
2014	2	4,88%
2015	1	2,44%
2016	4	9,76%
2017	1	2,44%
2018	2	4,88%
2019	1	2,44%
2020	0	0,00%
Total	**41**	

Appendix C: Industry distribution

Table C1: Sample A (ICR)

Industry	Distress	%	Non-distress	%	Mixed	%
Agriculture	1	0.63%	1	0.20%	2	0.30%
Mining	7	4.43%	35	6.99%	42	6.37%
Construction	3	1.90%	11	2.20%	14	2.12%
Manufacturing	102	64.56%	239	47.70%	341	51.75%
Transportation & public Utilities	5	3.16%	57	11.38%	62	9.41%
Wholesale Trade	2	1.27%	23	4.59%	25	3.79%
Retail Trade	2	1.27%	17	3.39%	19	2.88%
Finance	0	0.00%	0	0.00%	0	0.00%
Services	36	22.78%	118	23.55%	154	23.37%
Public Administration	0	0.00%	0	0.00%	0	0.00%
Total	**158**	**100%**	**501**	**100%**	**659**	**100%**

Table C2: Sample B (Z-score)

Industry	N	%
Agriculture	1	0.17%
Mining	38	6.43%
Construction	5	0.85%
Manufacturing	315	53.30%
Transportation & public Utilities	50	8.46%
Wholesale Trade	23	3.89%
Retail Trade	19	3.21%
Finance	0	0.00%
Services	140	23.69%
Public Administration	0	0.00%
Total	**591**	**100%**

Appendix D: Summary statistics

Table D1: Summary statistics; ICR-method

	Mean	*Median*	*Std. Dev.*	*25th Pct.*	*75th Pct.*
Distressed					
ICR	-	-	-	-	-
Z-score	-0,7947	0,4299	2,8760	-1,5060	1,0929
Profitability	0,1178	0,1262	0,1144	0,0799	0,1762
Relative_size	0,3832	0,1479	0,5235	0,0242	0,5564
Firm_size_Ta	30,2933	3,4467	73,0087	0,5894	20,6625
Firm_size_Acq	227,1401	40,6674	511,0283	7,7803	209,3285
Q_Ta	1,0469	0,6923	1,2296	0,3935	1,0908
Q_Acq	1,6310	1,2624	1,4999	0,7019	1,9640
Payment_Cash	0,5045	0,4322	0,4455	0,0000	1,0000
Bidders	1,0322	1,0000	0,1772	1,0000	1,0000
Industry_related	0,6193		0,4871		
Toehold	0,0258		0,1590		
Crisis_period	0,2903		0,4554		
Hostile	0,0516		0,2219		
Defence	0,0451		0,2083		
Observations	155				
Non-distressed					
ICR	-	-	-	-	-
Z-score	5,1651	3,6310	4,8161	2,5656	5,7191
Profitability	0,1543	0,1479	0,0893	0,1074	0,2046
Relative_size	0,2832	0,1305	0,3994	0,0319	0,3724
Firm_size_Ta	21,4648	5,1684	49,4094	1,6037	17,8542
Firm_size_Acq	201,8970	53,9057	383,1125	17,4255	212,9496
Q_Ta	1,6208	1,2253	1,3901	0,7407	1,9419
Q_Acq	1,7950	1,4360	1,5136	0,8632	2,1376
Payment_Cash	0,6411	0,8598	0,4144	0,2043	1,0000
Bidders	1,0940	1,0000	0,3361	1,0000	1,0000
Industry_related	0,5458		0,4984		
Toehold	0,0229		0,1499		
Crisis_period	0,1628		0,3696		
Hostile	0,0642		0,2454		
Defence	0,0275		0,1638		
Observations	436				

Appendix E: Boxplot; CAR (-1, +1)

The left boxplot group of public non-distressed targets and the right boxplot shows the group of public distressed targets. The horizontal line in the box shows the median. The edges of the square box indicate the 75th and 25th percentiles. Because there were outliers, the CAR was winsorized at 1%. It can be seen that the spread is between 0.15 and -0.15, which is a realistic representation of the CAR.

Figure E1: Boxplot; Public distressed and non-distressed targets (ICR)

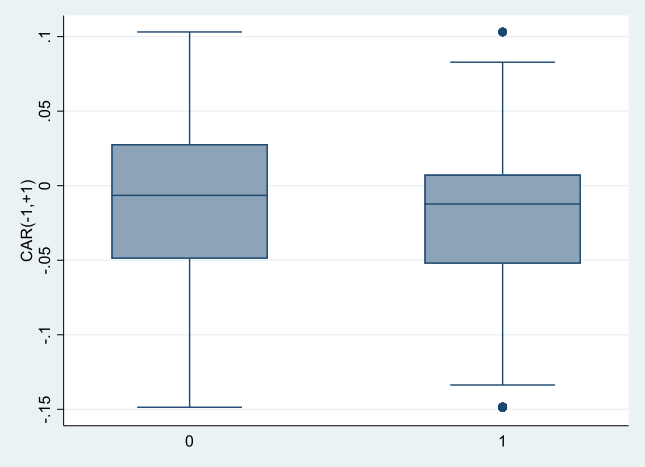
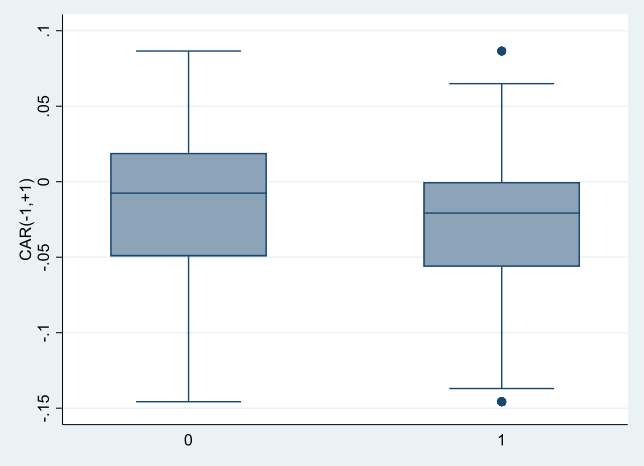


Figure E2: Boxplot; Public distressed and non-distressed targets (Z-score)



Appendix F: Cumulative abnormal return

Table F1: CAR; Private targets (interest coverage ratio)

Column1	*Distressed*	Column2	*Non-distressed*	Column3	*Difference*	Column4
	Mean	*Median*	*Mean*	*Median*	*Diff.*	*P-value*
CAR(10,10)	-0.0216	-0.0208	-0.0100	-0.0101	0.0116	0.2422
CAR(-5,5)	-0.0044	-0.0050	-0.0056	-0.0096	-0.0011	0.8930
CAR(-3,3)	-0.0097	-0.0073	-0.0078	-0.0103	0.0019	0.7979
CAR(-1,1)	-0.0138	-0.0055	-0.0092	-0.0081	0.0046	0.4580
CAR(0,2)	-0.0159	-0.0039	-0.0083	-0.0062	0.0076	0.2275
Observations	249		683			

Table F2: CAR; Private targets (Z-score)

Column1	Distressed	Column2	Non-distressed	Column3	Difference	Column4
	Mean	*Median*	*Mean*	*Median*	*Diff.*	*P-value*
CAR(10,10)	-0.0114	-0.0123	-0.0028	-0.0134	0.0086	0.4846
CAR(-5,5)	-0.0055	-0.0075	0.0106	-0.0020	0.0161	0.1294
CAR(-3,3)	-0.0092	-0.0108	0.0060	-0.0028	0.0152	0.1087
CAR(-1,1)	-0.0124	-0.0081	0.0006	-0.0026	0.0130*	0.0967
CAR(0,2)	-0.0113	-0.0049	0.0031	-0.0016	0.0144*	0.0680
Observations	172		506			

Appendix G: Regression hypothesis 1; Distressed public deals

Table G1: Sample B (Z-score)

Variables	*(1)*	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
Distress_Z	-0.0183*** (-2.57)	-0.0194*** (-2.70)	-0.0124* (-1.74)	-0.0145** (2.01)	-0.0146** (-1.96)	-0.0160** (-2.12)
Total_Assets_TA		-0.0090*** (-4.74)		-0.0063*** (-2.91)	-0.0063*** (-2.91)	-0.0075*** (-3.18)
Total_Assets_Acq		0.0067*** (2.73)		0.0036 (1.38)	0.0035 (1.37)	0.0031 (1.17)
Relative_size		0.0049 (1.02)		0.0041 (0.87)	0.0041 (0.87)	0.0038 (0.84)
Q_Ta		-0.0001*** (-5.08)		-0.0001 (-1.45)	-0.0001 (-1.42)	-0.0001 (-0.17)
Q_Acq		-0.0024 (-1.46)		-0.0021 (-1.37)	-0.0021 (-1.37)	-0.0017 (-1.21)
Cash payment			0.0337 (1.45)	0.0247 (1.08)	0.0247 (1.08)	0.0014 (0.06)
Bidders			-0.0171 (-1.35)	-0.0154 (-1.36)	-0.0154 (-1.35)	-0.0133 (-1.15)
Defence			0.0071 (0.56)	0.0042 (0.34)	0.0042 (0.34)	0.0210 (1.54)
Toehold			-0.0023 (-0.11)	-0.0118 (-0.55)	-0.0119 (-0.55)	-0.0061 (-0.27)
Hostile			0.0103 (0.86)	0.0168 (1.37)	0.0167 (1.37)	0.0123 (1.00)
Crisis period					0.0003 (0.04)	
Constant	-0.0158*** (-4.12)	-0.0133 (0.71)	-0.0303** (-2.27)	-0.0153 (-0.76)	-0.0153 (-0.77)	-0.0319 (-1.49)
R-squared	0.0100	0.0634	0.0919	0.1182	0.1183	0.1791
Year Fixed effect	No	No	No	No	No	Yes
Observations	591	591	591	591	591	591

Appendix H: Mean difference CAR

Notes. A T-test is performed for the differences between the groups. The P-value is based on the difference between the mean of the groups. The dependent CAR is the cumulative abnormal return of the acquiring company. The values *, ** and *** denote the significance levels of 0.10, 0.05 and 0.01. Finally, the ratios are winsorized at 1%. Appendix E1 represents the sample in which U.S. private and public firms are present. A distinction is made between bankrupt firms, which are in Chapter 11. Panel B includes only the private targets and Panel C includes only public targets. The targets that are bankrupt are found through the Thompson One database and complemented by the UCLA-LoPucki Bankruptcy Research Database. Panel D includes only the public bankrupt deals and the distressed deals. A target falls under distress if it has an ICR value below 1 for 2 years before the announcement date. Finally, the ratios are winsorized at 1%. E1.2 and E2.2 present the distribution of the CAR (-1, +1) with a boxplot. The left boxplot shows the non-distressed targets and the right boxplot shows distressed targets. The horizontal line in the box shows the median. The edges of the square box indicate the 75th and 25th percentiles. Because there were outliers, the CAR was winsorized at 1%. It can be seen that the spread is between 0.20 and -0.20, which is a realistic representation of the CAR.

Table H1: Bankrupt private & -public targets

Column1	(1)Bankrupt	Column2	(2)Non-Bankrupt	Column3	Difference (2)-(1)	Column4
	Mean	*Median*	*Mean*	*Median*	*Mean*	*P-value*
CAR(-3,3)	0.0210	0.0095	0.0068	0.0024	-0.0142*	0.0630
CAR(-1,1)	0.0219	0.0130	0.0073	0.0024	-0.0146**	0.0218
CAR(0,2)	0.0261	0.0161	0.0077	0.0028	-0.0184***	0.0047
Observations	123		13,474			

Table H2.1: Bankrupt private targets

Column1	(1)Bankrupt	Column2	(2)Non-Bankrupt	Column3	Difference (2)-(1)	Column4
	Mean	*Median*	*Mean*	*Median*	*Mean*	*P-value*
CAR(-3,3)	0.0309	0.0300	0.0072	0.0030	-0.0185	0.1513
CAR(-1,1)	0.0270	0.0263	0.0085	0.0037	-0.0236	0.1384
CAR(0,2)	0.0284	0.0255	0.0083	0.0035	-0.0201	0.1315
Observations	82		6,988			

Figure H2.2: Boxplot; bankrupt private targets

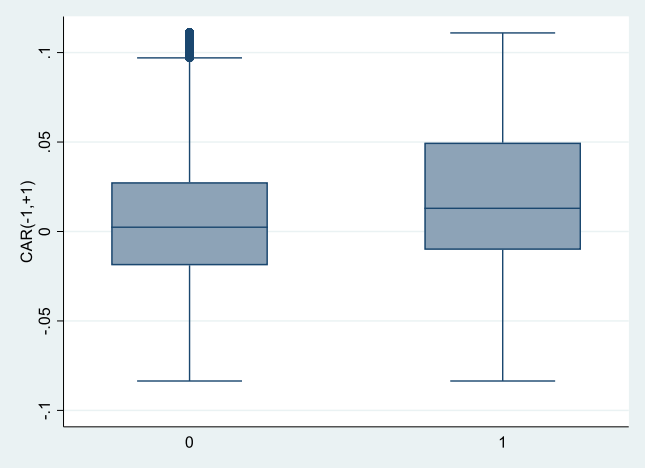


Table H3.1: Bankrupt public targets

Column1	(1)Bankrupt	Column2	(2)Non-Bankrupt	Column3	Difference (2)-(1)	Column4
	Mean	*Median*	*Mean*	*Median*	*Mean*	*P-value*
CAR(-3,3)	0.0246	0.0189	-0.0180	-0.0108	-0.0426***	0.0054
CAR(-1,1)	0.0297	0.0220	-0.0165	-0.0089	-0.0463***	0.0005
CAR(0,2)	0.0264	0.0212	-0.0164	-0.0062	-0.0428***	0.0012
Observations	41		659			

Figure H3.2: Boxplot; bankrupt public targets

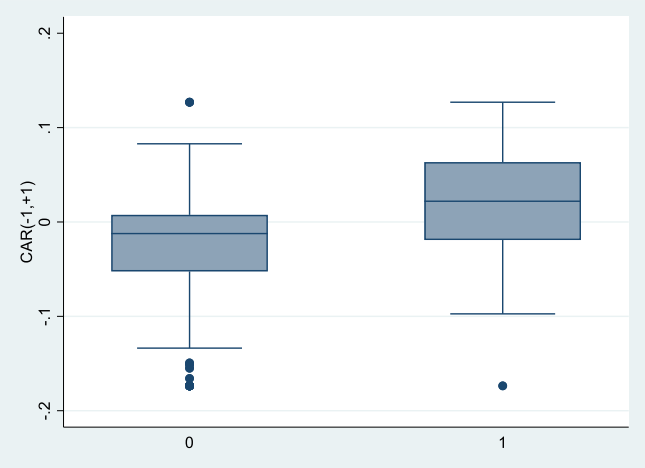


Table H4: Bankrupt public targets versus distressed public targets

Column1	Bankrupt (1)	Column2	Distressed (2)	Column3	Difference (2)-(1)	Column4
	Mean	*Median*	*Mean*	*Median*	*Mean*	*P-value*
CAR(-3,3)	0.0246	0.0189	-0.0342	-0.0139	-0.0588***	0.0007
CAR(-1,1)	0.0297	0.0220	-0.0330	-0.0123	-0.0627***	0.0000
CAR(0,2)	0.0264	0.0212	-0.0320	-0.0080	-0.0584***	0.0001
Observations	41		158			

Table H5: Bankrupt private targets versus distressed (ICR) private targets

Column1	Bankrupt (1) Column2		Distressed (ICR)(2) Column3		*Difference (2)-(1)* Column4	
	Mean	*Median*	*Mean*	*Median*	*Mean*	*P-value*
CAR(-3,3)	0.0309	0.0300	-0.0097	-0.0073	-0.0406***	0.0002
CAR(-1,1)	0.0270	0.0263	-0.0138	-0.0055	-0.0408***	0.0001
CAR(0,2)	0.0284	0.0255	-0.0159	-0.0039	-0.0443***	0.0000
Observations	82		249			

Table H6: Panel; Bankrupt private targets versus distressed (Z-score) private targets

Column1	Bankrupt (1) Column2		Distressed (Z-score)(2) Column3		*Difference (2)-(1)* Column4	
	Mean	*Median*	*Mean*	*Median*	*Mean*	*P-value*
CAR(-3,3)	0.0309	0.0300	0.0060	-0.0028	-0.0249*	0.0566
CAR(-1,1)	0.0270	0.0263	0.0006	-0.0026	-0.0264*	0.0531
CAR(0,2)	0.0284	0.0255	0.0031	-0.0016	-0.0253*	0.0547
Observations	82		172			

Appendix I: CAR per industry and size

This table shows the difference of the Cumulative Abnormal Return in which the companies are categorized by industry and by size. The event window is day -1 to +1, and the CAR of the acquirer firm is presented. The size is based on the market capitalization of the target prior to the announcement date. The median is the dividing line between small and large capitalization. Since only public firms have a market capitalization, namely the share price times the number of outstanding shares, only the public deals are shown.

Table I1: Bankrupt public targets

Industry	*Small*	*Large*	*Difference*	*N*
Agriculture	-	-	-	0
Mining	0.0877	-0.0925	-0.1802	4
Construction	-	-	-	0
Manufacturing	0.0586	0.0157	-0.0429	17
Transportation & public Utilities	-0.0202	-0.0397	-0.0195	5
Wholesale Trade	-	-	-	0
Retail Trade	-0.0010	0.0421	0.0431	4
Finance	-	-	-	0
Services	0.0523	0.0409	-0.0114	11
Public Administration	-	-	-	0
Total				41

Table I2: Distressed public targets

Industry	*Small*	*Large*	*Difference*	*N*
Agriculture	-	-	-	0
Mining	-0.0167	-0.0823	-0.0656	7
Construction	-0.0394	-0.0319	-0.2055	3
Manufacturing	-0.0319	-0.0123	0.0196	102
Transportation & public Utilities	-0.0199	-0.0200	-0.0001	8
Wholesale Trade	-	-	-	0
Retail Trade	-0.1134	0.0566	0.1700	2
Finance	-	-	-	0
Services	-0.0413	-0.0309	0.0103	36
Public Administration	-	-	-	0
Total				158

Appendix J

Table J1: Correlation matrix

	CAR 11	Distress _Z	Profitability	Syndicated	Total_Assets _TA	Total_Assets_ Acq	Relative_size
CAR11	100%						
Distress_ICR	-11%	100%					
Profitability	12%	-24%	100%				
Syndicated	7%	2%	5%	100%			
Total_Assets_ TA	-6%	-41%	14%	-8%	100%		
Total_Assets_ Acq	7%	-15%	21%	3%	52%	100%	
Relative_size	-19%	-12%	-1%	-4%	32%	-33%	100%
Q_Ta	-1%	7%	-6%	-1%	-12%	3%	-3%
Q_Acq	-14%	15%	-21%	-1%	-14%	-18%	11%
Cash_payment	23%	-5%	20%	5%	-6%	22%	-22%
Bidders	-6%	-5%	1%	-1%	10%	-1%	18%
Defence	-5%	-2%	-3%	-2%	-2%	-5%	-2%
Toehold	-4%	5%	-2%	-1%	-6%	8%	-7%
Hostile	2%	-6%	-8%	-1%	8%	0%	2%
Crisis_period	2%	5%	-2%	2%	2%	12%	-8%

	Q_Ta	Q_Acq	Cash_payment	Bidders	Defence	Toehold	Hostile	Crisis
Q_Ta	100%							
Q_Acq	0%	100%						
Cash_payment	-5%	-10%	100%					
Bidders	-1%	0%	1%	100%				
Defence	-1%	2%	-5%	4%	100%			
Toehold	0%	-1%	3%	0%	-3%	100%		
Hostile	-1%	-3%	7%	39%	26%	16%	100%	
Crisis_period	-2%	-7%	6%	-6%	1%	5%	3%	100%