The Influence of Distressed M&A on buyer performance

A study assessing the financial and short-term market performance of engaging in distressed M&A transactions.

This study investigates the effect of a distressed M&A transaction on the profitability and market performance of the acquiring party. Distressed M&A transactions include the discounted purchase of assets or the acquisition of ownership of a financially distressed target firm. Distressed M&As serve as an important tool to restructure financially struggling companies and to prevent the loss of value which can occur in bankruptcy. Despite this, studies investigating this topic are sparse and show inconsistent results. In this study, a difference-in-differences analysis is conducted. Two models are used, which use two different measures to evaluate the performance of acquiring firms following an acquisition. One measure estimates operating performance, while the other measure estimates the response of the market to the acquisition. The analysis shows that distressed and non-distressed M&A do not affect performance differently. This can be explained by the fact that the motives for distressed M&As and non-distressed M&As overlap and that distressed M&A has specific benefits and drawbacks which balance each other out on aggregate. This study looks at distressed M&A transactions with US buyers and targets from 2000-2019. Future research can improve upon this study by looking at distressed M&A in different countries, in a specific industry or a in different time-period.

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Content

1. Introduction

M&A has long been a popular means for external growth and industry consolidation (Sherman, 2010). The total transaction value of M&A deals has remained high in the period from 1998 to 2022 (Refinitiv Eikon, 2023). The United States leads the world in volume and value of transactions, with a wide range of sectors represented in M&A deals. In the year 2022 the total number of M&A deals in the country counted 60,927, with a total transaction value of 3.734 billion US dollars (Refinitiv Eikon. 2023). M&A activity impacts the economy of the United States in different ways. Successful M&A deals stimulate economic growth by creating more efficient and competitive companies. Furthermore, when companies merge and expand their business, new jobs are created. On the other hand, M&A may destroy jobs through the elimination of redundant positions or the closure of underperforming business units. M&A also

impacts the economy through industry consolidation. While this process can create more stable industries, it can also reduce competition and lead to higher prices for consumers.

Young (1981), Porter (1987), Cartwright and Cooper (Cartwright & Cooper, 1995), Datta (Datta, 2002) and Koetter (Koetter, 2005) all find that M&A transactions are relatively unlikely to meet their initial goals. This study investigates the financial health of the target company, as one potential source of M&A failure. First, the relevant literature about M&A and distressed M&A in particular is discussed. Second, a difference-in-differences analysis is conducted to investigate the effect of acquiring a company in financial distress. The financial distress is measured using the Z-score, which incorporates different financial ratios. Data on M&A transactions is collected from Datastream. The effect of an M&A transaction is measured in terms of the change in the return on the acquirers' assets and the returns on the acquirer's shares in the period after the acquisition. Acquisitions of distressed targets are compared to those of non-distressed targets to differentiate their respective effect on the performance of the acquiring company. Afterwards, the results are discussed and finally the findings are summarized in the conclusion.

Distressed M&A played a large role during the 2008 financial crisis. Many companies faced liquidity problems and their assets became available at discounted prices. A good example of a large, distressed M&A deal is the acquisition of Bear Stearns by JPMorgan. This deal clearly showcases how a buyer is able to negotiate a favorable price, due to the financial difficulties of the target. The culture at Bear Stearns was aggressive and overconfident. Excessive risk-taking was encouraged and the oversight of management was weak (Kensil & Margaraf, 2012). The Corporate library (2008) rated Bear Stearns' corporate governance in the years leading up to its failure with a D. Bear Stearns had developed a high leverage ratio, while simultaneously holding a high amount of illiquid assets on its balance sheet. This eventually caused a serious liquidity crisis. On May 29 2008, Bear Stearns' shareholders approved the sale to JPMorgan. Bear Stearns was valued at 10 dollars per share. This is a significant reduction from its 32 dollars close on the Friday before (Kensil & Margaraf. 2012). At the start of the financial crisis, JPMorgan had a relatively healthy balance sheet and strong risk management (JPMorgan annual report. 2008). Furthermore, the bank's leadership, including its CEO Jamie Dimon, took a proactive role by stabilizing the bank and making strategic decisions during the financial crisis. These factors put JPMorgan in a position to buy Bear Stearns. Bear Stearns reported a little more than 11 billion dollars in common equity and JPMorgan paid 1.5

billion dollars for the bank. Most of the value from this common equity however would sink into close-down costs, litigation expenses, severance costs and de-risking Bear Stearns' balance sheet (JPMorgan annual report, 2009). Despite initial costs being higher than anticipated, the addition of Bear Stearns' prime brokerage and commodities businesses would go on to have a diversifying effect and create growth for JPMorgan (JPMorgan annual report, 2012).

2. Previous research on acquirer performance

Although M&A is one of the wider covered topics in finance, fundamental questions remain unresolved due to inconsistent results from studies into the performance of M&A deals. This can be divided into *operating performance* and *market performance*. *Operating performance* measures the success of integrating a target firm into an acquiring firm, while *market performance* measures changes in *shareholder wealth*.

Healy et al, (1992) laid the theoretical groundwork for research into *operating performance*. They examined the ratio of *EBITDA* to revenues, standardized by the market value of assets for the 50 largest U.S. mergers between 1979 and 1984. *EBITDA* stands for *Earnings Before Interest, Taxes, Depreciation and Amortization*. *EBITDA* is used to assess a companies' ability to produce *cash flow* from its core business activities. They found a significant improvement in *asset productivity* for merged firms relative to their industries. Furthermore, they found that this improvement is particularly strong for mergers between companies in *overlapping industries*.

Heron & Lie (2002) examined *operating performance* by looking at operating income scaled by sales. They found that acquiring firms significantly outperform control firms with similar pre-acquisition *operating performance*. They also found that the *method of payment* does not appear to predict the firms' future *operating performance*.

Martynova et al, (2007) investigated the *long-term operating performance* of 155 European corporate takeovers completed between 1997 and 2001. The study found that *profitability* decreases significantly following a takeover. This decrease became insignificant however after peer firms were chosen to control for *(i) industry*, *(ii) size* and *(iii) pre-event performance*. These results suggest that the changes in *macro-economic conditions* matter more than the takeover itself.

When investigating *market performance*, Langetieg (1978), Asquith (1983) and Mangenheim and Mueller (1988) all find underperformance in the market over one to three years after a merger. While Bradley and Jarrel (1988) do not find underperformance in the market in the long run. Wansley et al. (1983) evaluate the effect of the *type of acquisition* and the *method of payment* on *market performance*. They find better short term *market performance* for acquisitions that are paid for in *cash* than those that are paid for in *stocks*. This result was confirmed by Healy et al, (1992). Moeller et al, (2003) found market underperformance in the long run. They identified the *size* of the acquiring firm as the most important explanation for the variation in performance.

Even though the research on *distressed M&A* is somewhat more sparse, some papers do have interesting implications. Clark & Ofek (1994) investigate the success of restructuring attempts, following the acquisition of distressed companies. They identify the following determinants of post-acquisition performance: (i) *bidder overpayment*, (ii) *method of payment*, (iii) *relative firm size*, (iv) *financial distress*, (v) *post-merger leverage*, (vi) *concessions*, (v) *target industry's post-merger performance,* (vi) *industry similarity* and (vii) *management expertise*. They measure *cash flow as the ratio of EBITDA to revenues* of merged firms. Contrary to Healy et al, (1992) they find a significant negative *operating performance*. While *overpayment for the target* helps explain unprofitable restructuring attempts, the *relative size of the acquirer* affected performance positively. Despite this result. they note that even an unsuccessful restructuring attempt might still retain more of the company's value than the alternative of liquidating the target firm's assets. They also find that the acquirer significantly underperforms in the stock market for all three years after the acquisition. They also find that the market shows the ability to predict the success or failure of a restructuring. Kruse & Timothy (Kruse & Timothy, 2002) examine the *long-term operating performance* of mergers of Japanese manufacturing firms for the period from 1969 to 1992. They find a significant positive effect on performance only in cases of diversifying mergers. They also find that distressed mergers are not likely to result in inferior *long-term performance*, contrary to the results of Clark and Ofek (1994).

3. Research question and Hypothesis

The results from previous research vary widely across different studies. Different factors seem to influence performance. Clark & Ofek (1994) furthermore stress that the

dynamics and factors that influence post-acquisition performance in distressed M&A are different from those in regular M&A transactions. Distressed M&A is a common way to restructure firms in distress and prevent them from going bankrupt and losing their going concern value (Peel et al., 1989). This has led to the following research question:

What is the effect of distressed M&A transactions on the acquirer's operational and market performance relative to its peers?

This study hypotheses that distressed M&A has a negative effect on performance, because the tendency of management to overemphasize the benefits of M&A transactions cause firms to misjudge the additional costs and risks associated with distressed M&A, causing acquiring firms to overpay for the target.

4. Theoretical Framework

This chapter gives an overview of the literature that forms the basis for understanding distressed M&A. Firstly, this chapter explains the definition of distress. Secondly, it provides insight into distressed M&A transactions. Thirdly, it gives an overview of performance.

4.1 Distressed firms

Lemmon et al. (2009) make a distinction between *economic distress* and *financial distress*. *Economic distress* occurs when a firm's fundamental business model becomes incompatible its the economic environment. *Financial distress* occurs when a firm does not have enough *liquid assets* to meet its obligations to *creditors*. (Hotchkiss et al., 2008). *Liquid assets* are assets that can easily be converted into cash. A *creditor* is a party that has a right to payment because it has provided goods, services or a loan in the past. When a firm is in *financial distress*, its value as a single entity may still be greater than the sum value of its individual assets. When this is the case, restructuring the *distressed firm* is preferable to the wholesale liquidation of its assets (Bebchuk, 1998).

Altman (1968) developed a formula to quantify *financial distress*. The formula incorporates five different financial ratios. each having its own weight. The resulting score is called the Altman Z-score and its formula is as follows:

$$Z = 1.2*\frac{Working\ capital}{Total\ Assets} + 1.4*\frac{Retained\ earnings}{Total\ Assets} + 3.3*\frac{EBIT}{Total\ Assets} + 0.6*\frac{Market\ value\ equity}{Book\ value\ tot.Liabilities} + 1*\frac{Sales}{Total\ Assets}$$

The ratios represent the firm's *activity*, *liquidity*, *solvency*, *leverage* and *profitability*. When a firm has a score of 1.8 or lower, it is considered financially distressed.

4.2 Mergers and Acquisitions

In a merger, two companies combine their assets and operations into a single entity (Parnes, 2009). Parnes (2009) distinguishes between *strategic* and *non-strategic acquisitions*. In *Strategic acquisitions* the *business operations* of the target and the acquirer complement each other. The different businesses can reinforce each other through *economies of scale* and *economies of scope*. *Economies of scale* refers to the spreading of fixed costs over a larger production volume. An example of *economies of scale* occurs when two car companies merge and move their production to a single factory. Heating costs and the rent for the factory can be spread out over a larger production volume. *Economies of scope* refer to lowering average cost by offering a variety of products or services together rather than separately (Besanko, Dranove, Shanley, & Schaefer, 2010). When two firms in different industries operate separate distribution networks for the same customer base, a merger between these two firms can allow the new business combination to sell off some of its warehouses and reduce its transportation fleet (Seth, 1990). *Non-strategic acquisitions* cannot be explained by mutually reinforcing business operations. Roll (1986) argues that *managerial overoptimism* due to *non-strategic incentives* can explain these acquisitions. Baker, Jensen and Murphy (1988) find for example that compensation of executive managers rises when a firm increases in size. Aktas, Bodt & Roll (2005) show that, when managers pursue mergers which are primarily motivated by expansion, this results in a loss of value.

Further motivations for M&A are market power (Chatterjee, 1986), price-setting power (Hitt, Ireland & Best, 1993), reducing supplier risk (Stucky & White, 1993) and reducing financial risk (Staller & Weinhold, 1979). A specific advantage of distressed M&A is that assets or shares can often be bought at significantly reduced prices (Bruton, Oviatt & White, 1994).

5. Empirical data and model

In this section, first the sample selection and elimination process will be described and second the regression methodology will be discussed.

5.1 Sample selection

This study considers US M&A deals between 2000 and 2019 with both US buyers and sellers. Data is collected from Refinitiv Eikon and Refinitiv Datastream. The data obtained are from 1997 to 2022. This time span includes a few years in which no transactions occur. This allows for the collection of all necessary data to calculate the ROA (return on Assets) and CAR (Cumulative Abnormal Return) for all transactions. Domestic US acquisitions are considered because this allows the results of this study to be compared to other papers that use domestic US acquisitions like Clark & Ofek (1998). To obtain a large enough sample size, data are collected from all completed transactions from 2000 until 2019 from the Refinitiv Eikon database. This creates a list of 8904 transactions. Table 1 summarizes the data collection process.

A minimum acquisition of 50% ownership is required to ensure that the acquisition has a noticable effect on performance and to make the effects comparable. This leaves 7890 companies. The method of payment is retrieved from the Refinitiv Eikon database, leaving 6782 transactions. Financial data of the target companies is obtained from Refinitiv Datastream to calculate their Z-scores at the time of the acquisition. When a target firm has a Z-score of 1.8 or lower it is classified as a "distressed target". This leaves 4232 companies. Transactions with a deal value which is smaller than 1 million USD are removed to ensure that the transaction has a sufficient effect on the performance of the acquirer and to make the effect more comparable. This leaves 3930 companies. The stock prices of the acquiring companies are collected from the Refinitiv Eikon Datastream event study tool for twenty days before the acquisition and twenty days after the acquisition from 1999 until 2020. These prices are used to calculate the return for each day. The differences between these returns and the return of the S&P 500 portfolio are used to calculate the CAR. The market performance of the acquiring firms before and after the acquisition is compared to isolate the effect of the acquisition. Transactions that lack the information required to calculate the CAR are removed. leaving 3438 transactions.

Debt as a percentage of equity. market capitalization and *dummy variables for the acquirer's industry* are obtained from Refinitiv Datastream. These variables are used to match companies in the treatment group to companies in the control group. They are chosen because they simultaneously affect both ROA and CAR as well as the likelihood that a firm engages in a distressed M&A deal. A companies' *debt as a percentage of equity* is included because fixed interest rates reduce the ROA. Furthermore, a high debt-to-equity ratio may cause the market to perceive the company as risky, which can affect the price of its shares. A company with high financial leverage may also have less flexibility to finance an acquisition though debt. This reduces the probability that it engages in an acquisition. Missing values for total debt as a percentage of equity are removed. leaving 3375 transactions. The economic conditions and the life cycle of its industry may affect the acquiring firm's ROA. When an industry experiences a period of economic downturn, the utilization of its assets may deteriorate. Furthermore, since the market holds different sentiments about different industries at a given time, the observed stock prices and subsequently the CAR is affected. Finally, M&A activity follows economic cycles and industry trends. When a certain industry experiences a period of consolidation, the likelihood of companies in this industry to engage in a transaction increases during that period. Companies with a large *market capitalization* benefit from more access to resources, easier access to capital and more dominant positions in their respective markets. These aspects affect the returns on their assets and the performance of their stocks. A high market capitalization may indicate that a company has enough resources to finance the transaction and the subsequent integration of the target. Furthermore, a high market capitalization can affect a companies' ability to engage in a stock-for-stock transaction because their shares can be used as a strong currency. Transactions that miss values to calculate market capitalization are removed, which leaves 3372 companies. Repurchase deals and Self Tender or Recapitalization deals are removed, since these deals do not involve the acquisition of a separate entity. This leaves 2215 transactions.

Data for ROA are obtained from 1997 until 2022. EBITDA and the book value of assets are obtained from Refinitiv Eikon Datastream for three years before and three years after the acquisition with a yearly frequency. To calculate ROA, EBITDA is divided by the book value of total assets. The differences in values before and after the acquisition allow us to make inferences about the effect of the acquisition on performance. Transactions without ROA values are removed. This leaves 1042 transactions. Finally, in the propensity score matching

process, not all transactions could be matched to each other. This leaves 605 transactions. These transactions include 323 unique acquiring firms and 504 unique targte firms.

Table 1: This table outlines the different steps in the data selection and elimination process. At each step a number of transactions are excluded from the dataset because certain characteristics of the transaction did not fit the criteria of this study or additional datapoints were missing.

VARIABLES	TRANSACTION
Export completed transactions from Refinitiv Eikon	8904
Minimum Acquisition of 50% ownership	7890
Remove transactions for which the method of payment is missing	6782
Remove transactions without financial data for the Z-score	4232
Deal value equal to or larger than 1 million	3930
Remove missing values for Cumulative Abnormal Return	3438
Remove missing values for total debt as a percentage of equity	3375
Remove missing values for Market Capitalization	3372
Remove Repurchase deals and Self Tender or Recapitalization deal	2215
Remove transactions without ROA values	1042
Final sample	605
Unique acquiring firms	323
Unique targt firms	504

Table 2: This table shows the descriptive statistics for the individual acquiring firms and the deals.

Panel A: Acquirer characteristics	obs	Mean	Median	SD	Minimum	Maximum
ROA	343	4.42	3.02	8.30	-50.30	35.04
CAR	343	-0.00	-0.00	0.10	-0.48	0.52
Leverage	343	-342.90	58.28	7968.05	-142987.20	2582.48
Market Value	343	37299.37	4990.32	132620.23	125.69	1882328

Panel B: deal characteristics	obs	mean	Median	SD	Minmum	Maximum
All cash	605	5.166	1	0,50	0	1
All stock	605	1.159	0	0,32	0	1
Related industries	605	0.7003	1	0,46	0	1

5.2 Variables

In this section the different variables of the Difference-In-Differences (DiD) regression are discussed. First, the dependent variables are discussed, which serve to measure the acquirer's performance. Second, the control variables are discussed, which serve to control for factors which are not the focus of this study but do affect performance.

5.2.1 Dependent variables

It is important to use both market-based measures as well as accounting based-measures when investigating performance (Harrison et al., 1991). When for example information is not distributed equally across market participants, the market is not expected to react accurately to an acquisition (Barney, 1988). The operating performance of the acquiring firm is measured using the ROA. A high ROA indicates that a company effectively uses the assets at its disposal to generate returns. If a company experiences trouble in its day-to-day operations, this will result in a deterioration of its asset utilization. For this reason, ROA serves as a good indicator for a company's operating performance. An important benefit of using ROA is that it is less biased than other accounting measures like ROE (Return on equity) and ROS (Return on sales) (Meeks & Meeks. 1981) (Anderson & Reeb, 2003). ROA is not affected by the degree of leverage in a target firm, while ROE is. This is especially important, given that distressed firms often exhibit high amounts of leverage. ROA also has some limitations. ROA can be affected by the industry of the acquirer, since companies in capital intensive industries require a higher amount of assets to generate a certain return. Furthermore, ROA doesn't consider risk and it is affected by differences in accounting methods. The market performance of the acquirer is measured using the CAR. The Prices used to calculate the CAR are measured twenty days before and twenty days after the acquisition. The cumulative abnormal return across τ days is calculated using the following formula:

$$CAR_{it} = \sum_{t=1}^{\tau} AR_{it}$$

Where ARit is the abnormal return for company$_i$ on day$_t$, which is obtained as follows:

$$AR_{it} = R_{it} - E(R_{it}|X_t)$$

R$_{it}$ denotes the daily simple return for company$_i$ on day$_t$. $E(R_{it}|X_t)$ denotes the expected return for company$_i$ in day$_t$. There are two ways to model the expected return: The *constant mean*

return model where Xt is constant and the *market model* where Xt is the return of the market portfolio. As the name implies, the constant mean return model assumes that the mean return of a security is constant over time. While this model is useful for short term forecasts, it ignores market dynamics. The market model does consider market dynamics, since it compares the performance of the security to the performance of a certain benchmark which represents the market portfolio (MacKinlay, 1997). Because of this, the market model is more suitable to isolate the effect of the acquisition announcement on market performance. For a security$_i$ on day$_t$ the market model is:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it}$$
$$E(\varepsilon_{it} = 0)$$
$$var(\varepsilon_{it}) = \sigma \varepsilon i^2$$

Where α_i and β_i are the intercept and slope of the linear relationship between the return of stock$_i$ and the return of the market in general, R_{it} is the expected return of stock$_i$ on day$_t$, R_{mt} is the return of the market portfolio on day$_t$ and ε_{it} is the unsystematic part of the return of stock$_i$. The S&P 500 is chosen to represent the market portfolio. This index captures overall market trends because it includes companies from a diverse range of sectors. Furthermore, its stocks are actively traded. This makes it a reliable measure of market movements. CAR relies on the assumption that market prices reflect all available information. It may not always be the case that a company's stock price reflects its true economic condition. Furthermore, the market model assumes a linear relationship between the securities and the market portfolio. During periods of high market volatility, it might be hard to attribute all changes to the acquisition event. Consequently, the variation in market volatility over time can make it more difficult to draw conclusions about the effects of acquisitions in our dataset that happen at different times. The reason CAR is used is because it provides a standardized measure which is relatively similar for different companies in different industries at different times. The limitations of CAR are addressed by the simultaneous use of ROA.

5.2.2 Control variables

The dependent variables are affected by several different factors which need to be controlled for. These factors consist of *deal characteristics* and *firm characteristics*. Deal characteristics are specific attributes of the transaction. Jensen (1986) states that mergers in unrelated industries are less likely to succeed because managers are less familiar with the

targets' industry and often grow the firm beyond its optimal size. Furthermore, the success of the transaction can be affected by the method of payment. Huang and Walkling (1987) find that payment with cash as opposed to stocks leads to better performance due to tax effects. *Firm characteristics* are specific to the acquirer. The leverage of the acquirer is expected to have a negative effect performance. A higher leverage means higher fixed interest costs. This will result in worse performance. all other things equal. Furthermore, an acquirer with a high amount of leverage can be expected to be less capable of financing the integration process and bearing the financial risks associated with the acquisition. Jensen (1986) finds that leverage is represented by the acquirer's debt as a percentage of equity. A firm's performance is also affected by its industry. When the industry of an acquiring firm is experiencing an upswing, performance is affected as well. Finally, the size of an acquiring firm can affect performance. Bruton et al, (1994) state that distressed targets require more resources and managerial attention than non-distressed targets. Larger firms are better positioned since larger firms are more capable of providing for these requirements. Furthermore, Fuller et al, (2002) argue that it is easier to manage an acquisition when the acquiring firm is larger in size. Size is represented by market capitalization.

5.3 Estimation procedure:

A Difference-In-Differences (DiD) analysis is used to estimate the effect of distressed M&A on performance. In this section, the different steps of this analysis are explained.

5.3.1 DiD analysis:

DiD analysis is a statistical technique which is used to measure the causal effect of a specific event. This method involves comparing changes in performance over time between firms that acquired a distressed target and firms that acquired a non-distressed target, both before and after the acquisition. These firms constitute the treatment group and the control group respectively. By comparing changes in performance over time, DiD controls for common time trends of the treatment and control groups. This helps to isolate the effect of the acquisition. Two separate models are used; Model 1 estimates the effect of the acquisition on the ROA and model 2 on the CAR. In model 1, the base period is three years before the year in which the M&A transaction is announced. The comparative period is defined as the three years after the year of the announcement. A period of three years has been chosen to take the length of the integration process into account. We consider ROA_{it} for the treatment group and

control group in the base years and the comparative years. We then regress ROA_{it} on various dummy variables in the following way:

$$ROA_{it} = \alpha_1 + \beta_1 \text{ Treatment}_{it} + \beta_2 \text{ Post-period dummy}_t + \beta_3 \text{ Treatment dummy}_i * \text{post-period dummy}_t + \beta_4$$
$$RELIND + \beta_5 \text{ Cash} + \beta_6 \text{ Stock} + \beta_7 \text{ Debt as percentage of Equity} + \beta_8 \text{ Fin} + \beta_9 \text{ HC} + \beta_{10} \text{ HT} + \beta_{11} \text{ CS} + \beta_{12} \text{ RE} +$$
$$\beta_{13} \text{ EP} + \beta_{14} \text{ CPS} + \beta_{15} \text{ IND} + \beta_{16} \text{ REES} + \beta_{17} \text{ ME} + \beta_{18} \text{ MAT} + \beta_{19} \text{ MV}$$

In model 2, the base period is defined as twenty days before the announcement of the acquisition. The comparative period is defined as twenty days after the announcement. It is assumed that most of the market's response will occur in the period. Furthermore, a shorter period is sensitive to short-term noise, while a longer period introduces effects that are unrelated to the acquisition. We consider CAR_{it} for the treatment group and the control group in the base period and the comparative period. We then regress CAR_{it} on various dummy variables in the following way:

$$CAR_{it} = \alpha_1 + \beta_1 \text{ Treatment}_{it} + \beta_2 \text{ Post-period dummy}_t + \beta_3 \text{ Treatment dummy}_i * \text{post-period dummy}_t + \beta_4$$
$$RELIND + \beta_5 \text{ Cash} + \beta_6 \text{ Stock} + \beta_7 \text{ Debt as percentage of Equity} + \beta_8 \text{ Fin} + \beta_9 \text{ HC} + \beta_{10} \text{ HT} + \beta_{11} \text{ CS} + \beta_{12} \text{ RE} +$$
$$\beta_{13} \text{ EP} + \beta_{14} \text{ CPS} + \beta_{15} \text{ IND} + \beta_{16} \text{ REES} + \beta_{17} \text{ ME} + \beta_{18} \text{ MAT} + \beta_{19} \text{ MV}$$

The analyses investigates whether significant changes occur between the treatment and control group in each of the comparative periods. Subscripts i and t denote the acquiring company and the year or day respectively. Treatment dummy$_i$ takes the value of 1 when company$_i$ is in the treatment group, and the value of 0 when company$_i$ is in the control group. Post-period dummy$_t$ takes the value of 1 when time period$_t$ is in a comparative period and 0 if time period$_t$ is in a base period. This study constructs a panel dataset of ROA_{it} and CAR_{it} based on the time elapsed after the base periods. Control variables are included as explanatory variables to control for potential confounding effects. The key explanatory variable in both models is treatment dummy$_i$ * post-period dummy$_t$. Coefficient β_3 represents the effect of the acquisition on the company's performance, if it is significant, it can be stated that distressed acquisitions have a different effect on performance then non-distressed acquisitions.

DiD relies on three assumptions. The *common trend assumption* assumes that the outcome variables of both the treatment and the control group move in parallel before the acquisition. When this is the case, there is reason to believe that the acquisition created an observed change in the outcome variables. Otherwise, the observed effect can also be a

coincidence. Because transactions are made in overlapping time periods, the common trends assumption is assumed to hold to a certain degree. The *Stable Unit Treatment Value Assumption* (SUTVA) assumes that the fact that one company acquires a distressed target does not affect the outcome variables of other acquirers. Furthermore, it assumes that all acquisitions of distressed targets have a comparable effect on the performance of the acquirer. This assumption is addressed by requiring a minimum acquisition of ownership of 50% per transaction, a minimum deal value of one million USD and by controlling for industry. The *conditional Independence Assumption* (CIA) assumes that the likelihood of acquiring a distressed target does not depend on another distressed M&A transaction. Because waves of industry consolidation cause this assumption to be violated, the industry of the acquirer is controlled for.

5.3.2 Propensity Score Matching

For the DiD analysis it is important that the treatment group and the control group have similar characteristics prior to the transaction. Only then can we interpret any differences in performance between the groups as being caused by the acquisition. The control group and the treatment group are matched based on likelihood to acquire a distressed target. A logistic regression is run in which a binary dependent variable takes the value of one when a distressed acquisition occurred and zero otherwise. The independent variables are debt as a percentage of equity, industry and market capitalisation. A score is created by combining the covariates of the independent variables of this regression. This score is the fitted probability that the firm will acquire a distressed target. based on the independent variables. (Rosenbaum and Rubin. 1983; Wooldridge, 2016). All firms are assigned this Score. Firms that have acquired a distressed target are subsequently matched to firms that have acquired a non-distressed target based on their score.

6. Results

This section describes the estimation results of model 1 and model 2. Results are assumed to be significant at a significance level of 5%. The study hypotheses that Acquiring a distressed firm has a negative impact on performance.

6.1 Effects on ROA

Table 2 shows the t-test for the significance of the difference in mean ROA between the treatment group and the control group. This test is used to investigate whether the difference

in ROA between acquiring healthy firms and distressed firms is significant. The T-test shows that there is a significant difference in ROA between the control group and the treatment group. This indicates that acquiring a distressed target does improve ROA more than acquiring a regular target.

Table 2: This table displays the results of the T-test for the difference in means between the treatment group and the control group with ROA as outcome variable. The statistically significant difference in mean ROA ($p < 0.05$) seems to indicate that the treatment group exhibits a higher ROA than the control group.

Group	Obs	Mean ROA	P-value diff>0
0	303	6.365	
1	302	7.285	
Difference	1	0.920**	0.01424

Table 4 displays the results of the DiD-analysis on ROA. The Treatment*Post-period value represents the effect of acquiring a distressed target on ROA three years after the acquisition. Its coefficient takes a negative value of -3.357e-01. This value is not significant. This result is contrary to the expectation that acquiring a distressed firm has a negative effect on operating performance. This could be explained by the fact that the acquisition of a distressed target is mostly driven by the same motivations as that of a non-distressed target, namely diversification and business expansion. Furthermore, an important advantage is that distressed targets can often be bought at a significant discount. A disadvantage is that additional costs and additional risks are related to restructuring a distressed target. These factors can cancel eachother out, which will then result in no observed difference in the ROA values for the treatment group and the control group. The Treatment-variable indicates whether the acquiring company has acquired a distressed target or a non-distressed target. The Post-period variable indicates whether the ROA is measured before or after the acquisition. Both these variables are not significant. In the DiD model, control variables are included as well. RELIND indicates whether the acquirer and the target are in the same industry. This variable has a negative but insignificant coefficient of -7.698e-01. This result is contrary to the findings of Jensen (1986) that unrelated mergers are less likely to succeed. One explanation for this can be that on average the benefits from diversification balance the waste of company resources when entering an industry without experience and growing the firm beyond its optimal size. Three Dummy variables are included for the method of payment: one for cash payment, one for stock payment and one for mixed payment. The coefficient for the variable for cash payment has a significant positive effect. This finding is in line with Huang and Walkling (1987) who find cash payments

lead to better performance due to tax effects. This is also in line with the negative effect on performance of stock payments. This effect is not significant. Debt as a percentage of equity has an insignificant positive effect of 2.362e-04. The results do not reflect the expectation that the leverage of an acquiring firm has a negative effect on ROA due to interest payments. One explanation for this as stated by Jensen (1986) might be that debt helps prevent firms with large cash-flows but few high return investments from wasting resources on low-return projects. Market Capitalisation has a significant positive effect of 1.202e-05. This is in line with the results from Bruton et al. (1994) that larger firms can more easily restructure distressed targets and Fuller et al. (2002) that larger acquiring firms can more easily manage an acquisition. Furthermore, more than half of the industry dummy-variables have a significant effect. This result confirms the idea that the performance of the acquirers is also affected by broader economic trends that are dependent on the acquirers industry. The Adjusted R-squared is 0.1941. This means that the model explains a modest amount of variation in ROA.

6.2 Effects on CAR

Table 3 shows the t-test for the significance of the difference in CAR for the treatment group and the control group. The t-test shows that there is a small difference between the CAR for the treatment group and the control group. This difference is not significant.

Table 3: This table displays the results of the T-test for the difference in means between the treatment group and the control group with CAR as outcome variable. The statistically insignificant difference in mean CAR ($p > 0.05$) does not indicate that there is a difference in CAR between the treatment group and the control group.

Group	Obs	Mean CAR	P-value diff>0
0	607	-0.007	
1	606	-0.005	
Difference	1	0.002	0.6678

Table 4 displays the results of the Difference-In-Differences analysis on CAR. The Treatment*Post-period value represents the effect of acquiring a distressed target on CAR. Its coefficient takes a negative value of -4.785e-04. This value is not significant. This result indicates that, contrary to the expectation that there is a negative effect, the market does not respond differently to the acquisition of a distressed target than to that of a non-distressed target. One explanation for this finding is that the market incorporates the target's publicly available information and anticipates that on average a fair price will be paid for the target. This reasoning is in line with the finding that operating performance does not differ

significantly between the two types of M&A either. When the market expects that the discount for the distressed target balances the additional costs of turning the target around, it is rational for the market to respond similarly to distressed acquisitions as to non-distressed acquisitions. The Treatment-variable indicates whether the acquiring company has acquired a distressed target or a non-distressed target. The Post-variable indicates whether CAR is measured before or after the acquisition. The Treatment variable takes a positive value of 1.013e-03. The Post-period variable takes a negative value of -9.449e-03. These values are not significant. Control variables were included as well. Whether the target and the acquirer are in the same industry has a positive but insignificant effect. The market does not appear to expect the relatedness of the industry to have an effect on the success of the acquisition. This can be due to the market's expectation that benefits from diversification balance the drawbacks associated with non-strategic acquisitions. The dummy variables for the method of payment have an insignificant negative effect. This is contrary to the expectation that the market views cash payments more favorably than stock payments due to a tax effect. One explanation for this can be that stock payments can also lead to tax benefits. An example of this is the ability to defer capital gains by using stock swaps. Furthermore, a stock payment might be perceived by the market as an indication that the acquiring company is confident that the synergy between the two companies will lead to long-term value for its shareholders. Debt as a percentage of equity has a significant negative effect of -1.099e-03. This finding confirms the idea that the market expects the leverage ratio of the acquirer to have a negative effect on performance due to high interest costs and the inability of the acquirer to bear the financial costs and risks of the acquisition. None of the industry dummy variables has a significant effect. This result is contrary to the expectation that the market expects the acquirer's performance to be affected by broader economic trends related to its industry. Economic trends are often complex and one explanation could therefore be that market participants do not efficiently incorporate information about industry trends. Market Capitalization has an insignificant negative effect of -3.710e-08. This is contrary to the expectation that the market expects large acquiring companies to perform better. One explanation for this could be that markets simultaneously hold the view that large companies may face greater challenges in integrating targets due to their complexity, their size and their additional layers of bureaucracy. The adjusted R-squared is 0.004829. This means that the model only explains a small amount of the variation in the value of CAR. This means that most of the variation in the CAR is explained by factors which are not incorporated into the model.

Table 4: This table displays the estimates of the effect of distressed M&A on ROA and on CAR. The Treatment*Post-period value represents the effect of acquiring a distressed target on ROA. Its coefficient takes a negative value of -0.035. This value is not significant. This result indicates that acquiring a distressed firm does not have a different effect on ROA compared to acquiring a non-distressed target. The Treatment*Post-period value represents the effect of acquiring a distressed target on CAR. Its coefficient takes a negative value of -0.000. This value is insignificant, which indicates that the market does not respond differently to the acquisition of a distressed target than to that of a non-distressed target.

	Dependent variable: ROA	Dependent variable: CAR
(Intercept)	2.104 (0.104)	-0.006 (0.7365)
Treatment	0.730 (0.124)	0.001 (0.8829)
Post-period	-0.035 (0.941)	-0.009 (0.1707)
Treatment*Post-period	–0.336 (0.617)	-0.000 (0.961)
RELIND (Related Industry)	-0.769 (0.139)	0.006 (0.278)
Cash	0.933 (0.037)*	-0.002 (0.730)
Stock	-0.372 (0.509)	-0.010 (0.212)
Debt as a percentage of Equity	0.000 (0.509)	-0.001 (0.0034)*
Fin (Financials)	-0.02 (0.985)	-0.001 (0.941)
HC (Healthcare)	7.609 (0.000)***	0.016 (0.366)
HT (High Technology)	6.033 (0.000)***	0.002 (0.889)
CS (Consumer Staples)	5.143 (0.000)***	-0.012 (0.522)
RE (Retail)	4.541 (0.002)***	0.004 (0.847)
EP (Energy and Power)	2.219 (0.108)	-0.006 (0.756)
CPS (Consumer Products and Services)	5.204 (0.000)***	0.026 (0.185)
IND (Industrials)	3.816 (0.001)**	0.006 (0.736)
REES (Real Estate)	0.907 (0.558)	0.002 (0.497)
ME (Media and Entertainment)	2.613 (0.150)	0.014 (0.603)
MAT (Materials)	2.967 (0.026)	0.017 (0.373)
MV (Market capitalization)	0.000 (0.000)***	-0.000 (0.304)
Adjusted R-squared	0.201	0.005
Residual standard error	5.843 on 1191 DF	0.08485 on 1192 DF
F-statistic	16.2 on 20 and 1191 DF	1.309 on 19 and 1192 DF
p-value	<0.000	0.167

7. conclusion

This study shows that neither the operating performance nor the market performance indicates that a distressed M&A transaction has a different effect on performance than a non-distressed M&A transaction. This result can be explained by the fact that the motivations for the acquisition of distressed and non-distressed targets largely overlap. Both targets serve to diversify and expand the acquirer's business. Furthermore, specific advantages and disadvantages to distressed M&A might cancel each other out on aggregate. In this study, confounding factors can violate the *parallel trends* assumption because these factors influence the outcome differently between the treated and control groups over time. This study does control for some confounding factors like the industry of the acquirer, the method of payment and the market capitalization. It is likely however that there are other confounding factors at play which are not included in this study. Examples might be macroeconomic conditions, challenges with integrating the target company, the different regulatory environments of individual states and the degree of market competition. This study can be improved by including missing confounding factors. It is important to be aware of the limitations of this study. The data for this study are from Datastream. This dataset is likely to have limitations in terms of coverage, accuracy and completeness. Furthermore, this study focusses on M&A deals in the period between 2000 and 2019 with both US buyer and target companies. These criteria may introduce selection bias, which could limit the degree to which the findings can be generalized to other settings and periods. Finally, the assumption of parallel trends is unlikely to hold in the setting of this study. This can affect the validity of the results. Therefore, it might be hard to draw conclusions about the relationship between distressed M&A and performance which can be generalized to other countries. The United States is unqiue in that it has a very mature M&A industry and a very large and liquid market. Future research can improve upon this study by looking at this relationship in other countries outside of the US. Furthermore, future research can improve upon this study by looking at different dynamics at play in specific sectors of the economy.

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