Distressed Firms' expected Mergers and Acquisitions Deal Characteristics: Unveiling Industry Differences

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ABSTRACT

Acquisitions made by distressed firms make out a substantial part of all acquisitions. This thesis explores the expected values of deal characteristics in the mergers and acquisitions market, and how they are influenced by the financial state of the acquiring firm. Exploratory research combines literature with data analysis to obtain and discuss industry differences in deal characteristics between 2010 and 2023. This thesis finds that there are significant differences in the expected value of deal characteristics. These findings demonstrate that if firms are choosing to acquire or merge during a period of financial distress, the expected values of deal characteristics are influenced by the acquirors industry.

Keywords: Mergers & Acquisitions, Financial distress, Industry differences, Deal characteristics

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CHAPTER 1 Introduction

In 2023, the number of bankruptcies worldwide rose by 7% year-over-year. For 2024, a further acceleration of 9% is foreseen (Consultancy.uk, 2024). This entails that increasing amounts of firms are, or are expected to be in a state of financial distress in the near future. Instinct might tell you that when you are struggling to pay your creditors you are not in a position to initiate an acquisition. But the opposite is true: acquisitions in distress are a type of turnaround strategy (Iyer and Miller, 2008). Managers contemplating their options to save their firm from bankruptcy have recently been more active in the acquisition markets. This means the acquisition activities of distressed firms have become a topic of increasing interest in the mergers and acquisitions (M&A) literature in recent years. The unit of analysis used are "large" firms surpassing $100 million in total assets. The primary topic researched in this study is industry classification and its relationship to financially distressed firms' M&A deal characteristics.

In the article "Why are Distressed Firms Acquisitive?", Zhang (2022) provides state-of-the-art knowledge concerning the relationship of acquisitions by distressed firms and their impact on bankruptcy risk. His research examines the acquisition activities undertaken by distressed companies and delves into the reasons driving these acquisitions. He finds a noteworthy trend: in the US, between 2010 and 2018, a portion of 23% of all spendings on M&As were done by distressed firms. Zhang (2022) concludes on a positive relationship between acquisitions and diversification of financial risk. He suggests that firms dealing with financial distress might pivot to an investment strategy that is more focused on external expansion. That acquisition diversifies bankruptcy risk was already suggested by Levy and Sarnat (1970) who reached the conclusion that diversifying acquisitions smoothens cash flows. In addition, Hotchkiss and Mooradian (1998) present empirical proof that acquisitions can streamline the reallocation of assets from companies. Acquirers of firms typically operate in similar industries and frequently have pre-existing connections with the target, indicating their strong awareness of both the worth and optimal utilization of the target's assets.

Although the literature is saturated with knowledge about acquisitions *of* distressed assets (Meier & Servaes, 2019), the research into the theories behind acquisitions *by* distressed firms is rather scarce. Zhang's findings present useful insights into the impact of acquisitions by distressed firms, yet there is uncertainty regarding the robustness of this effect across different industries. Each industry has its distinctive traits and operational dynamics, potentially resulting in different outcomes in the benefits that result from acquisitions. Not factoring in these disparities among industries could be misleading and result in different suggested strategies for specified firms. The goal of the thesis is to show that the results of Zhang's research are robust within the context of different classified industries. This analysis

can explain whether certain industries are better suited for acquisitions while under financial distress. Studying these differences will not only help understand how these acquisitions work but also give practical insights for managers in charge of the firm's investment strategy.

To fill the research gap, the following research question will be explored:
"How does the acquirer's industry sector affect the expected characteristics of merger and acquisition deals during periods of financial distress?"

The investigation of the research question is done in the format of an explorative research. This method is chosen, as this thesis regards a topic that is described but not studied in depth in current literature. Literary review combined with data analysis makes this research explorative. In investigating the research question, the primary used methodological approaches are a series of t-test and a regression, with the firms state of financial distress as independent variable. Only using deal values for acquisitions announced by firms with a book value over $100 million between 2010 and 2023. The data source used to gather this information is SDC Platinum in the LSEG environment. By employing these tests the study aims to control for industry-specific factors and unobserved heterogeneity across different industries. Firms are classified according to the Standard Industrial Classification (SIC) code system. SIC codes are numerical codes used to classify businesses into industries according to their primary economic activity. These codes facilitate consistent classification and enable the comparison of data across different industries. The determination of financial distress is based on the Altman Z-score, a widely recognized metric developed by Altman in 1968. Firms scoring below a threshold on the Altman Z-score will be classified as financially distressed firms. Non-distressed firms (scoring above the threshold) will serve as the control group for comparison purposes.

In this research, the expectancy is to find that the characteristics of acquisitions by distressed firms vary significantly across different industries. Some industries may present stronger arguments in favour for acquisitions during financial distress, while others may not. This variance could be attributed to the unique characteristics and operational dynamics of each industry, influencing firms' strategic decisions during times of financial difficulties. Other researchers can use this research to understand the importance of considering industry-specific factors when analysing the behaviour of distressed firms in acquisition markets. By accounting for these differences, researchers can better understand the underlying mechanisms driving acquisition decisions and their uses for firms facing financial distress. Additionally, insights gained from this study can potentially offer practical guidance to managers navigating their firms trough troubling financial periods. Guiding them in optimizing their investment portfolio more efficiently to their industry context. This research advances the scientific discussion by providing an understanding of the relationship between industry dynamics and acquisition behaviour during financial distress. By employing mean difference tests and considering a wide range of industries

this study contributes to a more comprehensive understanding of how industry-specific factors influence firms' strategic decisions. Chapter two starts by introducing the topics of this thesis using literature, followed by a data collection process in Chapter 3. Combining the data with the methodology in Chapter 4, the foundation is set to obtain and discuss the results in chapter 5. The thesis is finalised in Chapter 6 with the conclusion.

CHAPTER 2 Theoretical Framework

The following chapter aims to explore the key terms and topics of this thesis in the format of a literature review. After diving into every core subject individually, the relationships and connections between these subjects are explored using more literature.

2.1 Researched Topics

M&A and risk diversification are common practices in both developed and emerging economies. Combining corporate diversifying activities with the challenges of the management of a firm that exists in a financially distressed environment results in a list of critical subjects for all stakeholders. This section describes the mentioned three main topics individually.

Mergers and Acquisitions

The distinction between the terms acquisitions and mergers is complex. For the consistency of analysis in this paper, both terms are seen as the same event. This does not make it unnecessary to further explain of both terms. Piper and Schneider (2015) define a merger as a combination of assets. During an acquisition, one company gets absorbed by another. As stated by Reuer, Tong and Wu (2012), the absorbed company loses its identity by selling the control of its assets and liabilities to the acquiring firm. In both events, the outcome is identical: two firms are consolidated into a single entity. M&A is part of a larger idea within the financial world: a form of business expansion or growth strategy. Gaughan (2013) calls M&A an integral component of the growth strategy and it allows companies to achieve more rapid growth relative to what they would experience through internal processes. Furthermore, Gaughan (2013) proves that M&A has been the key to success for many companies. This gives persuasion for this study to research M&A performance at company level and thereby gaining the potential to find the differences between companies. Especially by selecting and comparing different sectors.

Mergers and acquisitions exist ever since the existence of companies. A notable merger happened in 1784, when the East India Company merged with a competitor to restore its monopoly over the Indian Trade (Shaw, 1887). This event causes a rise in popularity of the M&A market, resulting in multiple researchers discussing the theories of the benefits of such strategies. According to DePamphilis (2011) the main cause is the creation of synergy. Synergy occurs when two businesses combined will create greater value than if they are operated separately (DePamphilis, 2011).

Risk Diversification

A potential benefit of merging or acquiring is the diversification of company risk. DePamphilis (2011) defines diversification as: "buying firms outside a company's current primary lines of business. A common way to explain diversification of risk is the portfolio theory (Markowitz, 1991). Markowitz explains how by combining different assets, an investor can achieve better results than by simply

investing in a single asset. Diversification is a type of investment strategy, and is often justified by its ability to create financial synergy. The main synergy is a reduction in the cost of capital. Markowitz (1999) describes how portfolio theory reduces the cost of capital by promoting diversification (eliminating unsystematic risk) and optimizing allocation (highest expected return). Grubel (1968) was the first who mentions the importance of international diversification and the possibility of reducing portfolio risk below the level of systematic risk. This effect is still noticeable today regardless of increasing international market integration. International market integration facilitates firms with cross-border diversification opportunities. Acquirers get to expand the market for their current goods and services, while also enabling them to diversify their product lines (di Giovanni, 2005). Next to international expansion, a firm can choose to diversify by having modifications to their fundamental product line (DePamphilis, 2011). Resulting in an opportunity for a firm operating in a low growth market to transfer to a market with higher growth opportunities.

Having briefly mentioned cross-border diversification it is time to categorize the two other types of M&A, starting with Horizontal M&A. Farrell and Shapiro, (2001) define horizontal as an M&A activity between two organisations that operate in the same industry, and sell comparable products. Multiple benefits, such as reduced competition, an increased market share and operational synergies can arise from the union of two organisations (Capron, 1999). The second type of M&A activity is vertical M&A. In contrast to horizontal M&A, the activity does not take place in the same exact industry, but it does take place in the same supply chain. Zhou, Yan, & Liu (2019) define it as a means to remove market inefficiencies along the supply chain.

State of financially distressed

The unique aspect of this research is that it looks at financially distressed firms. Gordon (1971) explains that firms in financial distress are experiencing significant challenges in meeting their financial obligations, such as debt repayment or operational expenses. Financial distress is indicated by declining revenues, negative cash flows, or high levels of debt relative to assets. Whitaker (1999) shows that firms entering financial distress is often a result of poor management. Other examples of determinants of financial distress are an extreme book-tax difference (Noga & Schnader, 2013) and high R&D investments (Zhang, 2015), predominantly caused by uncertain payoffs. In this research I assess whether a firm is financially distressed by taking the firms Altman Z-score introduced by Altman (1986). His seminal research introduces a score that is composed by a combination of five accounting ratios to predict the likelihood of bankruptcy for firms (See section 4.3). The Altman Z-score is valued by mainstream finance research because it uses only financial statements to assess financial distress. The method does have limitations, such as failure to capture intangible assets and expected volatility (Habib et al., 2018)

This research uses the Standard Industry Classification (SIC) method, established by the U.S. government in 1937. It classifies industries by a four-digit code enabling a systematic identification of a company's primary line of business (NAICS, nd). This method enhances the consistency and comparability of the data, allowing precise analysis of industry-specific trends, drivers, and impacts of activities (Bhojraj et al., 2003). Moreover, it facilitates a comprehensive understanding of how firms within different industries strategically achieve growth, diversification, or competitive advantage, and even has capabilities to predict acquisition targets using public data (Palepu, 1986). Ultimately, the use of the SIC system provides a robust and standardized framework that ensures the integrity and reliability of my research findings.

2.2 Relationships Between Topics

This section examines how the combination of mergers and acquisitions by financially distressed firms can serve as a form of risk diversification. Research into the motivations behind acquisitions by distressed firms is limited, despite there being extensive literature on acquisitions of distressed assets. For example, Meier & Servaes (2019) highlight the disadvantages of reduced bargaining power by distressed sellers. In addition, studies indicate that acquisitions could serve to diversify bankruptcy risk for financially distressed firms (Weston, 1970). An example of diversifying company portfolio through the M&A market is eliminating unsystematic risk, especially when becoming a conglomerate. Weston (1970) classifies three types of conglomerate mergers: Product extension mergers, Market extension mergers and Unrelated extension mergers. Unrelated extension mergers provide the most diversification of company risk. That acquisition diversifies bankruptcy risk was already suggested by Levy and Sarnat (1970) who reached the conclusion that diversifying acquisitions smoothens cash flows, especially when exploiting the risk reducing facilitation of an international diversified portfolio. Additionally, Lewellen (1971) explains that acquisition leads to a decrease in asset volatility, which could be advantageous for distressed firms seeking to dodge risks associated with volatile markets or industries.

Diversifying acquisitions can increase the optimal leverage ratio (Leland, 2007), potentially providing firms with access to additional funding sources during financial distress. Moreover, Fluck and Lynch (1999) and Hubbard and Palia (1999) suggest that diversifying acquisitions can reduce the cost of capital for distressed firms, this is in line with the portfolio theory (Markowitz, 1991). A reduction in the cost of capital could be critical for firms facing financial challenges, and thus motivate firms to take on acquisitive action. Bruyland et al. (2019) demonstrate that bidders with high default risk tend to opt into diversifying acquisitions. This further supports the notion that distressed firms pursue acquisitions to diversify their risk exposure and enhance their financial status. Hotchkiss and Mooradian (1998) present empirical proof that acquisitions can streamline the reallocation of assets from companies. Acquirers of firms typically operate in similar industries and frequently have pre-existing connections with the target,

indicating their strong awareness of both the worth and optimal utilization of the target's assets (Mooradian, 1998).

Most of the literature discussed above is focussed on individual firms, however, this research uses acquisitions at the industry level. Schoenberg and Reeves (1999) look at main factors that may affect acquisition activity within an industry. Industries have different levels of attractiveness when it comes to acquiring, mostly because industries vary in their generic profitability (Porter, 1980). Christensen and Montgomery (1981) show that firms operating in profitable industries make more within-industry acquisitions, while firms originating from less profitable industries make more inter-industry acquisitions. This is done to enhance the firm's maximum profit potential. Another factor that may affect acquisition activity in a industry is the growth rate of the industry. Trautwein (1990) argues with his theory of 'empire building' that high growth industries are more attractive to acquirers, as they will provide growth opportunities to the acquiring firm.

CHAPTER 3 Data Collection

This chapter describes how the data is collected. It explains the motivation behind the restrictions and required characteristics of deals to be selected into the sample. Furthermore it explains how the variables in the sample are described and concludes with visualising the sample size.

3.1 Data Source

In order to analyse and predict expected M&A deal characteristics by distressed firms a dataset containing these deals. All merger and acquisition deal data used is gathered from SDC Platinum, a London Stock Exchange Group interface that contains an extensive database containing all recent M&A deals. The deals used in this research are within the time period 2010 to 2023, supporting the relevance of my research. SDC Platinum provides deals from worldwide (both US and non-US) acquirors targeting worldwide firms. In addition to general deal information, it offers detailed transaction information including crucial financial information about the acquiring firm. Using the interface's filtering capabilities, the relevant data is extracted. Furthermore accurate and reliable data, such as announcement date, deal type, deal value and the name of acquiring firm are also obtained.

3.2 Sample Selection

To efficiently collect the required data, a series of filters and restrictions are implemented. The sample period starts from 2010, as it is recent enough to be considered relevant. Additionally, starting from 2010 avoids the global financial crisis of 2007-2008, which had a profound impact on M&A activities. Starting from 2010 onwards gives the benefit of excluding the period of recovery after the financial crisis, a period during which data may be skewed. The sample period extends until 2023, making this research up-to-date and relevant.

The first restriction is that the deal value should exceed 1% of the total assets of the acquiring firm, to ensure the deal is economically relevant for the acquiring firm. Secondly, I only include large firms. The condition for being a large firm is that the market value of the acquiror (4 weeks prior to deal announcement) is greater than 100 million dollars. The acquiror must be publicly listed, this ensures the accounting ratios required for determining if the firm is in a state of financial distress are public. The acquirer and must obtain at least 50% additional ownership of the target after the deal. Companies in the financial industries (SIC header 6) are excluded. Financial sector firms often operate and behave differently than non-financial firms regarding M&A, and thus could negatively impact the results. In addition, regulated industries (SIC headers 48 and 49) and public administration (SIC header 9) are also excluded. Regulated industries (radiotelephone communications, electric gas and sanitary services) and public administration (executive, legislative and general government) are government-owned.

Government-owned firms are often susceptible to government funding, influencing their chances of being in financial distress and are thus making them inappropriate for this research.

3.3 Variable Description

In order to analyse the data effectively, all deals are categorised their respective industries based on their primary SIC code. The primary SIC code denotes the main line of business of both the acquiring and target firm. This approach ensures that M&A activities undertaken by subsidiaries are categorised in the parent companies main industry. Consistent categorization enables robust cross-industry comparisons, this is used to identify whether specific industries are more prone to M&A deals than others. Industry categorisation is conducted at both the acquiror and target levels in order to make the distinction between within-industry or cross-industry M&A activity.

3.4 Sample Size

Implementing all mentioned filters and restrictions, the dataset ends up at 9037 different occasions of merger or acquisition deals occurring between 2010 and 2023. Table 1a illustrates how the acquirors of these deals are distributed among the major industry groups based on their primary SIC code.

Table 1a: Sample industry distribution of Acquirors

Primary SIC Code	Industry Group	Number of deals	Percent
<1000	Agriculture	100	1.11
>= 1000, <1500	Mining	839	9.28
>= 1500, <1800	Construction	242	2.68
>= 2000, <4000	Manufacturing	4682	51.81
>= 4000, <4800	Transportation	427	4.73
>= 5000, <5200	Wholesale trade	365	4.04
>= 5200, <6000	Retail trade	423	4.68
>= 7000, <9000	Services	1959	21.68
	Total:	**9037**	

As can be seen in table 1 over half (51.81%) of all deals occurred in the Manufacturing industry group. Table 1b displays the distribution of these deals over the primary SIC codes within the manufacturing groups.

Table 1b: Sample Industry manufacturing distribution

Primary SIC Code	Manufacturing group	Freq.	Percent
>= 2000, <2200	Food products	399	8.52
>= 2200, <2400 & >=3100, <3200	Fabrics, Textile and Leather	139	140
>= 2400, <2600	Wood products + furniture	64	1.37
>= 2600, <2800	Paper and printing	198	4.23
>= 2800, <2900	Chemicals	1,148	24.52
>= 2900, <3100	Petroleum and rubber	147	3.14
>= 3200, <3300	Stone clay glass and concrete	139	2.97
>= 3300, <3400	Primary metals	219	4.68
>= 3400, <3500	Metal products	148	3.16
>= 3500, <3600	Machinery and Computer equipment	573	12.24
>= 3600, <3700	Electronic equipment	786	16.79
>= 3700, <3800	Transportation equipment	228	4.87
>= 3800, <3900	Measuring, analysing and controlling	433	9.25
>= 3900, <4000	Miscellaneous manufacturing	61	1.30
	Total	4,682	

Table 1c shows how the deals are distributed among nations. The nation indicates the primary nation where the acquiror is established.

Table 1c: Sample nation distribution

Nation	Freq.	Percent
China	2529	27,98
United States	2221	24,58
Japan	788	8,72
Canada	564	6,24
Great Brittain	494	5,47
Australia	307	3,40
South Korea	272	3,01
Sweden	152	1,68
Germany	112	1,24
India	111	1,23
Hongkong	106	1,17
Brazil	102	1,13
Other	1279	14,15
Total:	9037	100,00

CHAPTER 4 Method

4.1 Tests and Assumptions

The primary question of this research is how the financial state of a company influences the characteristics of M&A deals. This section describes the methods and techniques are implemented to achieve results that can give answer to this question. An effective way to investigate differences between industries is by performing a series of *t*-tests. These tests assess the equality of means by comparing two groups (Yim, 2010). It is applicable in scenarios where you want to compare means from two independent samples (Kim, 2015). In the case of this research the independent samples t-test is utilized because the sample consists of two independent groups: distressed and non-distressed firms. To meet to the *t*-test assumptions of normalization and homoscedasticity, all variables are tested for normality by graphical inspection. Additionally, each component variable is Winsorized at the 1-99% level. This sets a threshold where any data points below the 1st percentile are replaced with the value at the 1st percentile, and any data points above the 99th percentile are replaced with the value at the 99th percentile. Hargrave (2023) explains how this process helps in reducing the influence of extreme values without completely removing them from the dataset. It is a more robust method compared to simply removing the outliers, as it retains information about the extreme values while minimizing their impact on statistical analysis (Hargrave, 2023). These adjustments ensure that the data meet the necessary assumptions for conducting valid t-tests.

In addition to t-tests, I employed regression analysis to look into the relationship between a company's financial state and the characteristics of M&A deals. Regression analysis is a statistical technique used to determine the strength and significance of the relationship between one dependent variable and independent variables (Ryan, 2008). By interpreting how the variables changes across the different industries, the regression analysis provides predictors of M&A deal characteristics. To meet the assumptions of an OLS-regression, the following precautions are taken:

A series of White tests (see appendix A) conclude that there is heteroscedasticity in all but one model. The models with inconsistent and biased standard errors are corrected by employing robust standard errors. Normality in the errors is satisfied by using a large sample.

4.1 Independent Variable

The independent variable used in the statistical t-test is:

Distressed dummy: Based on the *Altman's Z-score.* Firms scoring below 1.8 on the Altman Z-score will be classified as financially distressed firms and takes the value of 1. Non-distressed firms scoring above 2.7 will take the value of 0. See chapter 4.3 for how the Altman Z-score is calculated.

4.2 Dependent Variables: Deal Characteristics

To obtain useful information on the deal characteristics the following dependent variables were selected to perform the *t*-test:

Log(deal value): the natural logarithm of the M&A deal value in USD millions. Because deal values can vary widely, from 1 million, my specified bottom line to ensure economical relevance, up to 86 billion, the logarithmic value helps to normalize the data. Reducing skewness, reducing variance and thus catering for t-test assumptions.

Deal value / Acquiror total assets: Proportion of the deal value relative to the total assets of the acquiror company. The main use is to assess the financial impact of the deal on the acquiror. A higher ratio indicates that a larger portion of the acquirors assets is required to finance the deal.

Cash payment (%): Percentage of the deal value paid in cash. Transactions can involve combinations of payment, like stock, debt or cash. Cash payment percentage indicates immediate impact on the acquirors wallet. High portion of cash payment may indicate strong liquidity, or that the acquirors stock is undervalued, and thus the acquiror is not willing to pay with it.

Group diversifying dummy: Takes the value of 1 if the acquirer and the target do not share the same two-digit primary SIC code; = 0 otherwise. The first two digits of the SIC code indicate the major industry group. Different codes classify the deal as diversifying outside of the acquirors own major industry group.

Industry diversifying dummy: Takes the value of 1 if the acquirer and the target do not share the same three-digit primary SIC code; = 0 otherwise. The first three digits of the SIC code indicate the industry group. Different codes classify the deal as diversifying outside of the acquirors own industry group. An example of a major industry group is Mining (SIC 1000) , an example of a industry group is Coal mining (SIC 1200).

Cross border diversifying dummy: Takes the value of 1 if the acquirer and the target do not share the same nation code; = 0 otherwise. The nation code indicates the main nation where the acquiror is established. Different codes classify the deal as diversifying cross border of the acquirors nation.

4.3 Dependent Variables: Acquiror Characteristics

To obtain useful information on the characteristics of the acquiror the following dependent variables were selected to perform the *t*-test:

Shares acquired (%): Percentage of the target companies shares that are acquired in the transaction. This provides the level of ownership that the acquiror gains over the target company. This variable ranges from 50%, the minimal requirement, up to 100%, a complete buyout.

Log(total assets): the natural logarithm of the acquiror's total assets in USD millions. Because total assets values can vary widely, from 100 million, the minimal requirement to be in the sample, up to 707

billion, the logarithmic value helps to normalize the data. Reducing skewness, reducing variance and thus catering for t-test assumptions.

Current ratio: The acquirors current assets proportioned to their current liabilities. This portrays the firms short-term liquidity and its ability to meet short-term obligations. A high ratio may indicate a conservative liquidity management, a low ratio may signalise a companies disability to cover short term obligations (Fernando, 2024)

4.3 Dependent Variable: Altman's Z-score

To test for financial status of the acquiror, specifically to test if they are in a state of financial distress, the Altman Z-score is implemented.

Altman's Z-score:. Based on 5 accounting ratios (Altman, 2013), this method yields an independent variable *Altmanscore*. This score decides if an acquiror is distressed (see chapter 4.1). The Altman Z-score is composed of multiple variables and is calculated in the following way:

$$AltmanZ_1 = \frac{3.3 * \text{pre tax income}}{\text{total assets}}$$

$$AltmanZ_2 = \frac{1.4 * (\text{net income} - \text{dividends})}{\text{total assets}}$$

$$AltmanZ_3 = \frac{1.2 * (\text{current assets} - \text{current liabilities})}{\text{total assets}}$$

$$AltmanZ_4 = \frac{0.999 * \text{sales}}{\text{total assets}}$$

$$AltmanZ_5 = \frac{0.6 * \text{bookvalue per share} * \text{fully diluted shares outstanding}}{\text{total liabilities}}$$

$$AltmanZ = AltmanZ_1 + AltmanZ_2 + AltmanZ_3 + AltmanZ_4 + AltmanZ_5$$

All financial results are based on the most current financial report of the acquiring firm up to 12 months prior to date announcement, all in millions (USD). Each component variable is Winsorized at the 1-99% level, so is the final Z-score. Resulting in the distribution shown in graph 1. The distribution is right-skewed, with a long tail extending to the right. The tail indicates there are a number of companies with a relative high score. This is exemplified by the bump at the right-hand extreme, a collection of the 1% highest scores, clustered at one specific value caused by the winsorizing.
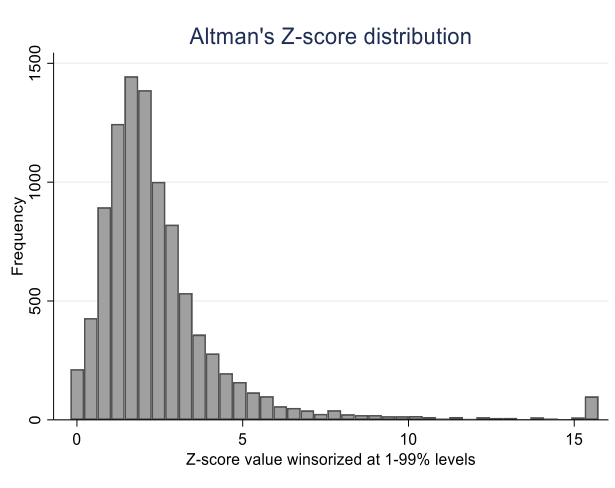
Figure 1: Altman's Z-score distribution

As mentioned in chapter 4.1, Firms scoring below 1.8 on the Altman Z-score will be classified as financially distressed and firms scoring 2.7 or above on the Altman Z-score will be classified as non-financially distressed. Graph 2 and table 3 show the distribution of all firms and their level of distress. A firm scoring left from the red line is classified as distressed, firms scoring right from the green line are non-distressed. All firms between the lines are not categorised.
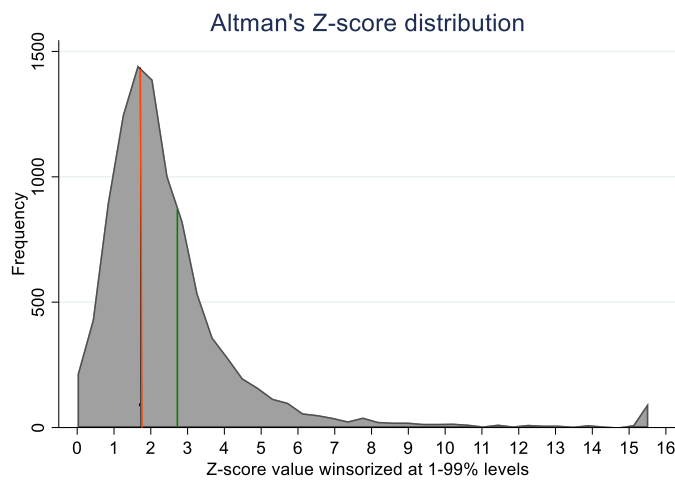
Table 2: Z-score distribution

Altman Score	Frequency	Percent
<1,8	3138	32%
≥1.8 & <2.7	2487	26%
≥2.7	4057	42%
Total	9682	

Figure 2: Altman's Z-score distribution with distressed conditions

CHAPTER 5 Results

5.1 Non Industry-specific Characteristics

This section looks at all industries combined when it comes to the average characteristics of acquisitions. Firstly, it looks at the average values of deal and acquiror characteristics of the average distressed acquiror (1). Secondly, it looks at the average values of deal and acquiror characteristics of the average non-distressed acquiror (2). The results are tested for differences between means by a two-sample t-test. The average distressed acquirer is compared to the average non-distressed, (1) – (2).

Table 3: M&A deals by distressed and non-distressed acquirors

|	(1)		(2)				
	Distressed acquirer		Non-distressed acquiror				
	All Industry		All Industry		(1) - (2)		
	N	Mean	N	Mean	diff.		t-stat.
Panel A: Deal Characteristics							
Log(deal value)	4742	5,114	5014	4,636	0,478	***	(11,83)
Deal value/acquiror total assets	4742	0,308	5014	0,562	-0,254	***	(-6,52)
Cash payment (%)	2869	75,21	2991	70,119	5,091	***	(5,79)
Group diversifying dummy	4742	0,473	5014	0,441	0,032	**	(3,21)
Industry diversifying dummy	4742	0,580	5014	0,548	0,031	**	(3,11)
Cross border diversifying dummy	4742	0,257	5014	0,204	0,053	***	(6,18)
Panel B: Acquirer Characteristics							
Shares acquired (%)	4742	91,217	5014	92,811	-1,594	***	(-5,16)
Altman's Z-score	4742	1,044	3103	6,898	-5,854	***	(-15,71)
Log(total assets)	4742	7,866	5014	7,214	0,653	***	(17,19)
Current ratio	4742	1,629	3411	5,390	-3,761	***	(-9,44)

*, **, and *** represent statistical significance at the 10%, 5%, and 1% levels.

Panel A of Table 4 compares the characteristics of the average deals made by distressed and non-distressed acquirers. Although the acquisitions by distressed acquirers (*d*) are larger than those by non-distressed (*nd*) acquirers (*d:*5.11*, nd:*4.64) the relative sizes are smaller. On average, the value of a deal is 30.8% of the distressed acquirer's total assets; this is 25.4 percentage points less than that made by a non-distressed acquirer. Distressed firms also pay significantly more in cash to the target firms (*d:*75.2%*, nd:*70.1%). It is consistent with M&A Community Portal (2024), who argue that cash payments provide certainty to the target's shareholders as they receive immediate payment for their shares. This can speed up the transaction process and reduce uncertainty caused by the distressed status of the acquiror. In addition sellers may prefer to not receive stock instead of cash if they do not believe in the growth of the combined entity, again caused by the distressed status of the acquiror (M&A Community Portal, 2024). Secondly the characteristics that potentially contribute to the diversification benefits are discussed. I define an acquisition as group diversifying if the acquirer and the target do not

share the same two-digit SIC codes. I define an acquisition as industry diversifying if the acquirer and the target do not share the same three-digit SIC codes. 57.9% of deals announced by distressed acquirers are industry diversifying deals. The percentage of both industry and group diversifying acquisitions is significantly (at 5%) higher for distressed firms than non-distressed firms, consistent with Nejadmalayeri & Rosenblum (2022) who finds that distressed firms acquire for diversification, rather than the risk-shifting or growth opportunity reasons exploited by non-distressed firms. To even further explore the degree of diversification for the acquisitions, it is evaluated if the target firm is established in the same nation as the acquiror. Again is seen that distressed firms are more likely to acquire in a diversifying manner, this time outside of their own borders (*d:25.7%*, *nd:20.4%*). This is consistent with Cárdenas (2023), who argues the main driver as rewards for cross-border M&A is portfolio diversification. It is also consistent with Zhang (2022) who indicates that distressed acquirers engage in deals with more diversification benefits. Especially that distressed firms are more likely to make acquisitions that diversify cash flow risks and investment opportunities than non-distressed firms.

Panel B of Table 4 compares the characteristics of the average distressed and non-distressed acquirer. By design distressed acquirers score lower Altman's Z-scores (*d:1.04, nd:6.90*). Not only the Z-score, but also the components are lower scoring, such as the current ratio (*d:1.63, nd:5.39*). Distressed firms being close to the ratio of 1.00, what would indicate that the firm does not have the capital on hand to meet its short-term obligations if they were all due at once (Fernando. 2024). Distressed acquirers have on average a bigger firm size (total assets: *d:7.87*, *nd:7.21*), this is also partly caused by design. In the process of conducting the Altman Z-score the firms total assets is the denominator of the equation, meaning that having more total assets results in a bigger denominator thus a lower score.

5.2 Industry-specific Characteristics

This section looks at every industry individually when it comes to the average characteristics of acquisitions. Firstly, it looks at the average values of deal and acquiror characteristics of the average distressed acquiror in the specific industry (1). Secondly, it looks at the average values of deal and acquiror characteristics of the average non-distressed acquiror in the specific industry (2). Thirdly, it looks at the average values of deal and acquiror characteristics of an average non-distressed acquiror in all industries combined (3). The results are tested for differences between means by a two-sample t-test. Firstly, the average distressed acquirer in a specific industry is compared to the average non-distressed acquirer in the same specific industry, (1) – (2). Secondly, the average distressed acquirer in a specific industry is compared to the average non-distressed acquirer in all industries combined, (1) – (3).

5.2.1 Industry-specific Characteristics – Agriculture

As the agricultural industry only accounts for just over 1% of all investigated deals it is not the most important industry in this research. Still the t-test is appropriate for smaller sample sizes because it accounts for the increased variability (Kim, 2015). That being said, if a manager of a distressed agricultural firm is contemplating a M&A deal its expected characteristics are shown in table 5.

Table 5: M&A deals by the Agriculture Industry

	(1) Distressed acquirer Agricultural Industry		(2) Non-distressed acquiror Agricultural Industry		(3) Non-distressed acquiror All industries		(1) - (2)				(1) - (3)			
	N	Mean	N	Mean	N	Mean	diff.		t-stat.		diff.			t-stat.
Panel A: Deal Characteristics														
Log(deal value)	57	3,5815	20	3,814	5014	4,6361	-0,232		(-0.49)		-1,055	***		(-4.19)
Deal value/acquiror total assets	57	0,3095	20	0,504	5014	0,5617	-0,195		(-1.17)		-0,252			(-0.76)
Cash payment (%)	29	51,775	12	76,441	2991	70,119	-24,666	*	(-2.04)		-18,344	**		(-2.84)
Group diversifying dummy	57	0,6491	20	0,800	5014	0,4406	-0,151		(-1.25)		0,209	**		(3.15)
Industry diversifying dummy	57	0,7018	20	0,800	5014	0,5483	-0,098		(-0.84)		0,153	*		(2.32)
Cross border diversifying dummy	57	0,0702	20	0,350	5014	0,2044	-0,280	**	(-3.24)		-0,134	*		(-2.51)
Panel B: Acquirer Characteristics														
Shares acquired (%)	57	91,683	20	92,614	5014	92,811	-0,931		(-0.24)		-1,128			(-0.58)
Altman's Z-score	57	1,2570	18	6,103	3103	6,8978	-4,846	***	(-3.71)		-5,641			(-1.66)
Log(total assets)	57	6,0897	20	5,855	5014	7,2137	0,235		(0.79)		-1,124	***		(-4.44)
Current ratio	57	1,5983	20	4,321	3411	5,3903	-2,723	***	(-3.69)		-3,792			(-1.05)

*, **, and *** represent statistical significance at the 10%, 5%, and 1% levels.

The first significant finding is that distressed acquirers in the agricultural industry have lower deal values compared to distressed acquirers across all industries. This is explained by the significant difference in average total assets, as the Log(total assets) is lower. Less total assets often result in smaller deals in terms of value. A more industry-specific interpretation could be that the nature of assets of agricultural deals involve more physical type assets like land or animals, and less intangible assets like intellectual property. This is supported by the fact that agricultural deals are less commonly cross-border, as acquisition of land is less common to do cross border, and sometimes even restricted by law (Swinnen & Vranken, 2009)

5.2.2 Industry-specific Characteristics – Mining

The mining industry accounts for over 9% of all deals. The expected characteristics of deals in the mining industry are shown in table 5.

Table 5: M&A deals by the Mining Industry

	(1) Distressed acquirer Mining Industry		(2) Non-distressed acquiror Mining Industry		(3) Non-distressed acquiror All industries		(1) - (2)				(1) - (3)			
	N	Mean	N	Mean	N	Mean	diff.		t-stat.		diff.			t-stat.
Panel A: Deal Characteristics														
Log(deal value)	376	5,4626	286	4,6997	5014	4,6361	0,763	***	(5.26)		0,826	***		(8.19)
Deal value/acquiror total assets	376	0,2357	286	0,4839	5014	0,5617	-0,248	***	(-5.60)		-0,326	*		(-2.53)
Cash payment (%)	183	66,0818	145	60,3497	2991	70,1190	5,732		(1.39)		-4,037			(-1.53)
Group diversifying dummy	376	0,2048	286	0,1818	5014	0,4406	0,023		(0.74)		-0,236	***		(-8.99)
Industry diversifying dummy	376	0,3165	286	0,2867	5014	0,5483	0,030		(0.82)		-0,232	***		(-8.75)
Cross border diversifying dummy	376	0,2606	286	0,2972	5014	0,2044	-0,037		(-1.04)		0,056	**		(2.59)
Panel B: Acquirer Characteristics														
Shares acquired (%)	376	92,6853	286	93,6791	5014	92,8108	-0,994		(-0.90)		-0,125			(-0.16)
Altman's Z-score	376	0,9825	249	12,1154	3103	6,8978	-11,13	***	(-4.25)		-5,915	***		(-4.47)
Log(total assets)	376	8,0023	286	6,4577	5014	7,2137	1,545	***	(12.55)		0,789	***		(7.77)
Current ratio	376	1,6970	283	6,7483	3411	5,3903	-5,051	***	(-6.57)		-3,693	**		(-2.62)

*, **, and *** represent statistical significance at the 10%, 5%, and 1% levels.

According to Saidu (2007), the mining industry has certain a combination of characteristics. These include high capital intensity and non-renewable resources. High capital intensity means that firms in the mining industry accumulate more total assets compared to other industries, as can be seen in table 5. Firms in the mining industry are significantly less likely to acquire a diversifying target. Because of the non-renewable nature of the industry (Saidu, 2007) and regulatory national control over natural resources acquisitions are often within-borders. Barham and Coomes (2005) know that mining investments involve large sunk costs. Large sunk costs result in an average lower current ratio signalling mining firms are less able to pay short term debt. Plenty sunk costs and other specifically mining industry investments are required to achieve a minimum efficient scale (Barham & Coomes, 2005). To further exploit economies of scale mining firms mostly acquire other mining firms and diversify less by acquiring firms from other industries.

5.2.3 Industry-specific Characteristics – Construction

The mining industry is a smaller industry in the M&A market and accounts for 2.68% of all deals. The construction industry has little deviation from the mean when it comes to deal and acquiror characteristics. The expected characteristics of deals in the construction industry are shown in table 6.

Table 6: M&A deals by the Construction Industry

	(1) Distressed acquirer Construction Industry		(2) Non-distressed acquirer Construction Industry		(3) Non-distressed acquiror All industries		(1) - (2)			(1) - (3)		
	N	Mean	N	Mean	N	Mean	diff.		t-stat.	diff.		t-stat.
Panel A: Deal Characteristics												
Log(deal value)	86	4,3934	62	4,0587	5014	4,6361	0,335		-1,07	-0,243		(-1.18)
Deal value/acquiror total assets	86	0,1728	62	0,2905	5014	0,5617	-0,118		(-0.96)	-0,389		(-1.45)
Cash payment (%)	46	76,5147	39	73,3776	2991	70,1190	3,137		(0.43)	6,396		(1.25)
Group diversifying dummy	86	0,8023	62	0,6290	5014	0,4406	0,173	*	(2.37)	0,362	***	(6.72)
Industry diversifying dummy	86	0,8721	62	0,6935	5014	0,5483	0,179	**	(2.71)	0,324	***	(6.01)
Cross border diversifying dummy	86	0,2093	62	0,0645	5014	0,2044	0,145	*	(2.48)	0,005		(0.11)
Panel B: Acquirer Characteristics												
Shares acquired (%)	86	88,2328	62	90,4818	5014	92,8108	-2,249		(-0.77)	-4,578	**	(-2.85)
Altman's Z-score	86	1,1549	60	3,9082	3103	6,8978	-2,753	***	(-10.64)	-5,743	*	(-2.08)
Log(total assets)	86	7,7472	62	6,6786	5014	7,2137	1,069	***	(4.92)	0,533	**	(2.58)
Current ratio	86	1,3947	62	2,8927	3411	5,3903	-1,498	***	(-4.90)	-3,996		(-1.36)

*, **, and *** represent statistical significance at the 10%, 5%, and 1% levels.

Construction industry firms are more likely to diversify when it comes to M&A deals. Both cross-group and cross-industry diversifying dummies have a significant positive mean difference. A particular reason for this is that the gains of the global construction business and the fall of traditional trade barriers attracts contractors to diversify into the international market place (Ye et al., 2017). By doing so, construction firms can move flexibly with market demands, and lower the risk of over-indexing upon specific regional markets or business sectors.

5.2.4 Industry-specific Characteristics – Manufacturing

The mining industry accounts for over half of all deals. The expected characteristics of deals in the manufacturing industry are shown in table 7.

Table 7: M&A deals by the Manufacturing Industry

	(1)		(2)		(3)		(1) - (2)			(1) - (3)		
	Distressed acquirer Manufacturing Industry		Non-distressed acquiror Manufacturing Industry		Non-distressed acquiror All industries							
	N	Mean	N	Mean	N	Mean	diff.		t-stat.	diff.		t-stat.
Panel A: Deal Characteristics												
Log(deal value)	1737	5,0173	1534	4,3362	5014	4,6361	0,681	***	(9.64)	0,381	***	(7.02)
Deal value/acquiror total assets	1737	0,2605	1534	0,7719	5014	0,5617	-0,511	***	(-5.38)	-0,301	***	(-4.98)
Cash payment (%)	1098	78,0264	976	73,8844	2991	70,1190	4,142	**	(2.86)	7,907	***	(6.60)
Group diversifying dummy	1737	0,5141	1534	0,5007	5014	0,4406	0,013		(0.77)	0,074	***	(5.31)
Industry diversifying dummy	1737	0,6304	1534	0,6278	5014	0,5483	0,003		(0.16)	0,082	***	(5.97)
Cross border diversifying dummy	1737	0,2844	1534	0,2419	5014	0,2044	0,043	**	(2.76)	0,080	***	(6.90)
Panel B: Acquirer Characteristics												
Shares acquired (%)	1737	90,5760	1534	90,7803	5014	92,8108	-0,204		(-0.36)	-2,235	***	(-5.30)
Altman's Z-score	1737	1,1852	1484	5,8155	3103	6,8978	-4,630	***	(-15.08)	-5,713	***	(-9.29)
Log(total assets)	1737	7,8504	1534	6,3458	5014	7,2137	1,505	***	(25.55)	0,637	***	(11.91)
Current ratio	1737	1,7108	1529	4,6897	3411	5,3903	-2,979	***	(-20.22)	-3,680	***	(-5.61)

*, **, and *** represent statistical significance at the 10%, 5%, and 1% levels.

Deals in the manufacturing industry are on average larger than in other industries, but are on average smaller when it comes to the ratio of deal value to total assets. This is explained by the average more total assets of the acquiring firms in the manufacturing industry. Distressed acquirers in the manufacturing industry use on average more cash instead of stock to pay for the transaction. The deals are more likely to diversify to other industries, and to other nations. The percentage of shares acquired in the transaction is less compared to other industies. This signals a more mergers instead of complete acquisitions.

5.2.5 Industry-specific Characteristics – Transportation

The Transportation industry accounts for close to 5% of all deals. The expected characteristics of deals in the transportation industry are shown in table 8.

Table 8: M&A deals by the Transportation Industry

	(1)		(2)		(3)		(1) - (2)			(1) - (3)		
	Distressed acquirer Transportation Industry		Non-distressed acquiror Transportation Industry		Non-distressed acquiror All industries							
	N	Mean	N	Mean	N	Mean	diff.		t-stat.	diff.		t-stat.
Panel A: Deal Characteristics												
Log(deal value)	254	5,0342	82	4,7182	5014	4,6361	0,316		(1.29)	0,398	**	(3.27)
Deal value/acquiror total assets	254	0,2051	82	0,6958	5014	0,5617	-0,491	**	(-3.02)	-0,357	*	(-2.28)
Cash payment (%)	139	80,7947	44	69,5566	2991	70,1190	11,238	*	(2.05)	10,676	***	(3.58)
Group diversifying dummy	254	0,5591	82	0,6463	5014	0,4406	-0,087		(-1.39)	0,118	***	(3.71)
Industry diversifying dummy	254	0,6496	82	0,6707	5014	0,5483	-0,021		(-0.35)	0,101	**	(3.17)
Cross border diversifying dummy	254	0,2638	82	0,2073	5014	0,2044	0,056		(1.03)	0,059	*	(2.28)
Panel B: Acquirer Characteristics												
Shares acquired (%)	254	89,8465	82	93,3475	5014	92,8108	-3,501		(-1.72)	-2,964	**	(-3.12)
Altman's Z-score	254	0,9735	74	5,9183	3103	6,8978	-4,945	***	(-13.01)	-5,924	***	(-3.68)
Log(total assets)	254	7,9269	82	6,6270	5014	7,2137	1,300	***	(6.77)	0,713	***	(5.86)
Current ratio	254	1,3093	79	2,4605	3411	5,3903	-1,151	***	(-5.73)	-4,081	*	(-2.38)

*, **, and *** represent statistical significance at the 10%, 5%, and 1% levels.

The percentage of cash used in deals in the transportation industry is on average higher than in other industries. This signals that transportation firms think their stock not undervalued, so they are less willing to finance the transaction with it. Transportation firms are more likely to to acquire a target in a different industry. This is explained by Alparslan (2020) who argues that in the transportation and logistics industries companies have the benefit that synergy effects are nearer since they are always in a

related chain with another industry. Because of the origin of the industry firms often have a lot of total assets, as the industry demands lots of investment in tangible assets, like fleets of trucks or railroads.

5.2.6 Industry-specific Characteristics – Wholesale Trade

The Wholesale Trade industry accounts for just over 4% of all deals. The expected characteristics of deals in the transportation industry are shown in table 9.

Table 9: M&A deals by the Wholesale Trade Industry

| | (1) | | (2) | | (3) | | (1) - (2) | | (1) - (3) | |
| | Distressed acquirer Wholesale Industry | | Non-distressed acquiror Wholesale Industry | | Non-distressed acquiror All industries | | | | | |
	N	Mean	N	Mean	N	Mean	diff.	t-stat.	diff.	t-stat.
Panel A: Deal Characteristics										
Log(deal value)	68	4,8097	186	4,3125	5014	4,6361	0,497	(1.83)	0,174	(0.75)
Deal value/acquiror total assets	68	0,2159	186	0,2148	5014	0,5617	0,001	(0.02)	-0,346	(-1.14)
Cash payment (%)	45	84,6666	112	80,2435	2991	70,1190	4,423	(0.85)	14,548 **	(2.81)
Group diversifying dummy	68	0,8676	186	0,6290	5014	0,4406	0,239 ***	(3.74)	0,427 ***	(7.07)
Industry diversifying dummy	68	0,8824	186	0,7097	5014	0,5483	0,173 **	(2.87)	0,334 ***	(5.52)
Cross border diversifying dummy	68	0,5000	186	0,2043	5014	0,2044	0,296 ***	(4.82)	0,296 ***	(5.98)
Panel B: Acquirer Characteristics										
Shares acquired (%)	68	91,1208	186	90,4754	5014	92,8108	0,645	(0.28)	-1,690	(-0.94)
Altman's Z-score	68	1,1528	181	4,7250	3103	6,8978	-3,572 *	(-2.57)	-5,745	(-1.85)
Log(total assets)	68	8,4447	186	7,1355	5014	7,2137	1,309 ***	(5.27)	1,231 ***	(5.27)
Current ratio	68	1,6334	186	2,0171	3411	5,3903	-0,384 *	(-2.21)	-3,757	(-1.13)

*, **, and *** represent statistical significance at the 10%, 5%, and 1% levels.

The percentage of cash used in deals in the wholesale trade industry is on average higher than in other industries. This signals that wholesale trade firms think their stock not undervalued, so they are less willing to finance the transaction with it. Deals with Wholesale Trade firms as acquiror are more likely to diversify outside their own industry and border. Barnes (2002) calls diversification as a Wholesale Trade acquiror a marketing strategy and a possibility that may be helpful in succeeding in the future. Because wholesalers are able to sell their products for a lower price as they are selling in bulk (Brightpearl, 2024) there are a number of investments needed resulting in sunk costs. This raises the total assets of the firm, giving a argument in favour of the result in table 9 showing the average total assets of the firm are larger compared to other industries.

5.2.7 Industry-specific Characteristics – Retail Trade

The Retail Trade industry accounts for 4.68% of all deals. The expected characteristics of deals in the transportation industry are shown in table 10.

Table 10: M&A deals by the Retail Trade Industry

| | (1) | | (2) | | (3) | | (1) - (2) | | (1) - (3) | |
| | Distressed acquirer Retail Industry | | Non-distressed acquiror Retail Industry | | Non-distressed acquiror All industries | | | | | |
	N	Mean	N	Mean	N	Mean	diff.	t-stat.	diff.	t-stat.
Panel A: Deal Characteristics										
Log(deal value)	128	4,8885	191	4,6987	5014	4,6361	0,190	(0.76)	0,252	(1.48)
Deal value/acquiror total assets	128	0,3292	191	0,4880	5014	0,5617	-0,159	(-0.93)	-0,233	(-1.05)
Cash payment (%)	78	83,0891	118	83,9426	2991	70,1190	-0,853	(-0.21)	12,970 **	(3.29)
Group diversifying dummy	128	0,6641	191	0,5812	5014	0,4406	0,083	(1.49)	0,223 ***	(5.03)
Industry diversifying dummy	128	0,6719	191	0,5864	5014	0,5483	0,085	(1.54)	0,124 **	(2.78)
Cross border diversifying dummy	128	0,1406	191	0,1780	5014	0,2044	-0,037	(-0.88)	-0,064	(-1.77)
Panel B: Acquirer Characteristics										
Shares acquired (%)	128	88,2745	191	91,3954	5014	92,8108	-3,121	(-1.64)	-4,536 ***	(-3.43)
Altman's Z-score	128	1,2511	167	4,3624	3103	6,8978	-3,111 ***	(-7.54)	-5,647 *	(-2.49)
Log(total assets)	128	8,1585	191	7,1410	5014	7,2137	1,018 ***	(5.74)	0,945 ***	(5.54)
Current ratio	128	1,0277	191	8,2643	3411	5,3903	-7,237	(-0.90)	-4,363	(-1.81)

Distressed aquirers in the retail industry use significantly larger portion of cash in the transaction compared to all non-distressed acquirors averaged. On average, the percent of shares acquired in the transaction is lower, this signals more mergers and less complete takeovers. This could be because the retail market is the most direct connection between manufacturers and customers. In the retail industry, a strong brand and identity are essential. Mergers offer a better chance of retaining the loyalty of the target company's customers because they keep the acquired company's brand and identity (Álvarez-González & Otero-Neira, 2022). This helps maintain customer loyalty, making them to continue purchasing from the newly merged firm. In contrast, acquisitions can potentially disrupt customer loyalty if the acquiring company changes or eliminates the brand of the acquired company. In addition, distressed acquirers in the retail industry are more likely to diversify into different industries and industry groups compared to non-distressed acquirers in all industries. This can also be because of the strategy to build a strong brand by diversifying to other markets. An example of this, included in this research, is the merger of Amazon.com and Whole Foods Market. White (2020) knows that by acquiring Whole Foods, Amazon extended its brand into the high-quality, organic grocery market, appealing to health-conscious consumers and enhancing its reputation for offering diverse and premium products.

5.2.8 Industry-specific Characteristics – Services

The Service industry accounts for 21.68% of all deals. The expected characteristics of deals in the transportation industry are shown in table 11.

Table 11: M&A deals by the Services Industry

	(1)		(2)		(3)		(1) - (2)			(1) - (3)		
	Distressed acquirer Services Industry		Non-distressed acquiror Services Industry		Non-distressed acquiror All industries							
	N	Mean	N	Mean	N	Mean	diff.		t-stat.	diff.		t-stat.
Panel A: Deal Characteristics												
Log(deal value)	795	4,8351	661	4,1740	5014	4,6361	0,661	***	(6.58)	0,199	**	(2.73)
Deal value/acquiror total assets	795	0,3082	661	0,4288	5014	0,5617	-0,121	**	(-2.94)	-0,254	**	(-2.85)
Cash payment (%)	605	72,3544	466	72,8601	2991	70,1190	-0,506		(-0.26)	2,235		(1.47)
Group diversifying dummy	795	0,3560	661	0,3949	5014	0,4406	-0,039		(-1.53)	-0,085	***	(-4.48)
Industry diversifying dummy	795	0,4541	661	0,5053	5014	0,5483	-0,051		(-1.95)	-0,094	***	(-4.96)
Cross border diversifying dummy	795	0,3057	661	0,2284	5014	0,2044	0,077	***	(3.31)	0,101	***	(6.44)
Panel B: Acquirer Characteristics												
Shares acquired (%)	795	93,7722	661	92,3105	5014	92,8108	1,462		(1.91)	0,961		(1.73)
Altman's Z-score	795	1,0701	634	5,4986	3103	6,8978	-4,429	***	(-13.52)	-5,828	***	(-6.41)
Log(total assets)	795	7,2062	661	6,2284	5014	7,2137	0,978	***	(12.80)	-0,008		(-0.11)
Current ratio	795	1,6505	648	4,3245	3411	5,3903	-2,674	***	(-11.70)	-3,740	***	(-3.86)

The services industry includes the business services sector and several other sectors that produce knowledge-intensive inputs for other industries (Kox, 2002). This industry specific knowledge and other intangible assets like customer relations and brand reputation make it hard for firms in the Services industry to diversify to other industries. This is why we see an average lower than the average of all non-distressed acquirers across all industries. But because these intangible assets are not limited by

culture or borders we do see a higher likelihood of a deal that is cross border compared to non distressed acquirers in other industries.

5.2 Industry-specific Regressive Relationships

This looks at the strengths and characters of the relationship between one output variable, in this case: (1) Log(deal value), (2) Deal value/acquiror total assets, (3) Cash payment (in percentage), (4) Group diversifying dummy, (5) Industry diversifying dummy (6) Cross border diversifying dummy, and their relationship to all industries. The reference industry is manufacturing, as it is the most heavily populated industry. This choice is motivated by Hardy (1993) who explains that a well defined reference group with a sufficient number of cases results in a precise estimate of the subgroup mean.

The expected value of the outcome variable is constructed for any combination of industry and state of distressed by adding the relevant coefficients:

$$Expected\ value = \beta0 + \beta1(Distressed) + \beta2(Industry) + \beta3(Industry\ Distressed)$$

Example 1.

E*xpected log(deal value) for a M&A deal with a distressed acquiror in the mining industry:*

$$Log(deal\ value) = 4.339 + (0.823 \times 1) + (0.353 \times 1) + (-0.063 \times 1) = 5.4529$$

Example 2.

Expected group diversifying for a M&A deal with a non distressed acquiror in services industry

$$Group\ diversifying = 0.506 + (-0.025 \times 0) + (-0.132 \times 1) + (-0.011 * 0) = 0.374$$

Example 3.

Expected Cross border M&A deal with a non distressed acquiror in manufacturing industry

$$Cross\ border = 0.236 + (0.024 \times 0) = 0.236$$

Table 12: Industry specific regression analysis

	Log(deal value)	Deal value/acquiror total assets	Cash payment (%)	Group diversifying dummy	Industry diversifying dummy	Cross border diversifying dummy
	(1)	(2)	(3)	(4)	(5)	(6)
Distressed	0,823***	-0,514***	2,884*	-0,025	-0,032*	0,024
Agriculture	-0,528	-0,260	2,190	0,294**	0,163	0,114
Mining	0,353**	-0,281*	-13,427***	-0,326***	-0,353***	0,068*
Construction	-0,281	-0,474	-0,874	0,123*	0,057	-0,172**
Transportation	0,379	-0,067	-4,695	0,141*	0,034	-0,029
Wholesale Trade	-0,027	-0,549***	5,992	0,123***	0,073	-0,032
Retail Trade	0,359*	-0,276	9,691**	0,075*	-0,051	-0,059
Services	-0,166	-0,336***	-1,275	-0,112***	-0,132***	-0,007
Agriculture*distressed	-1,054*	0,319	-27,551*	-0,126	-0,067	-0,304**
Mining*distressed	-0,063	0,269	2,373	0,041	0,058	-0,067
Construction*distressed	-0,488	0,396	0,253	0,198*	0,210*	0,121
Transportation*distressed	-0,506	0,024	8,354	-0,063	0,010	0,032
Wholesale Trade*distressed	-0,326	0,515	1,539	0,263***	0,204**	0,272***
Retail Trade*distressed	-0,665**	0,358	-3,738	0,105	0,114*	-0,060
Services*distressed	-0,165	0,395**	-3,531	-0,011	-0,017	0,052
Constant	4,339***	0,764***	74,251***	0,506***	0,637***	0,236***
Number of observations	7195	7195	4486	7195	7195	7195

Table 3: Regression results

*, **, and *** represent statistical significance at the 10%, 5%, and 1% levels.

Only the significant (at the 10% level at least) are discussed. The row labelled "distressed" in table 12 shows that distressed acquirors in the manufacturing industry have a higher expected deal value and a lower expected deal value to total assets ratio compared to non-distressed manufacturers. In addition the portion of the deal paid with cash is larger and they are less likely to diversify outside of their own industry.

Agricultural acquirors are more often diversifying outside of their own industry group compared to manufacturers. The distressed acquirers from the agricultural industry have lower deal values, pay a smaller portion of the transaction with cash and are less often diversifying across the border.

Mining industry acquirors have higher deal values but a lower deal value to total assets ratio. They pay a smaller portion of the transaction with cash. They are less often diversifying outside both industry and industry group, but are more often diversifying across the border.

Construction firms have more deals with diversification outside of their industry group, but less deals that are diversifying across the border. Distressed construction firms have more deals with diversification outside of their industry and industry group.

Transportation industry acquirors have more deals with industry group diversification.

Wholesale traders have a lower deal value to total assets ratio, but have more deals with industry group diversification. Distressed wholesale traders have even more diversification, including industry, industry group and cross-border.

Retail traders have larger deal values, pay a bigger portion of the transaction with cash, and have more diversification outside of their industry group. Distressed retail traders have on the other hand lower deal values, and are also more often diversifying outside of their industry.

Services industry deals have a lower deal value to total assets ratio and have less both industry and industry group diversification. Distressed firms in the services industry have higher deal value to total assets ratio's.

CHAPTER 6 Discussion

6.1 Limitations

Like any academic research, this thesis has several limitations that must be acknowledged:

Data availability: Although the data provided by SDC Platinum is a robust source of information for this thesis, relying solely on a single database could lead to limitations. Certain industries might have been underrepresented, as SDC Platinum might have excluded some relevant mergers or acquisitions. Using multiple sources of information in combination with a comparison might lead to a more complete sample.

Altman Z-score: The Altman Z-score mentioned in Chapter 4.3 has several limitations. Primarily the fact that the score is calculated based on accounting ratios, which are only available if the company is publicly traded. This meant implementing the restriction that all acquirers must be publicly traded, reducing the sample size by over 50%. Secondly, because the Z-score is solely based on quantitative financial data, the qualitative factors are neglected. Factors such as managerial environment, current market conditions and industry-specific regulations are excluded in the decision-making process of the financial state of the company. Further research may use additional (qualitative) factors to obtain to decide the financial state of the acquiror.

Literature: This thesis is guided and built upon existing literature. As mentioned before, the research into the theories behind acquisitions *by* distressed firms is rather scarce, making it a under-researched area. Zhang (2022) mentions there is no empirical evidence in the literature for a causal relationship between bankruptcy risk and diversification through acquisitions, as the correlation may be due to omitted variables driving both. The lack of evidence makes it difficult to decide if certain industries are better suited for acquisitive strategy while being in a state of financial distress.

6.2 Relevance

Academic Relevance: This thesis contributes to the field of mergers and acquisitions by exploring a relatively under-researched area: the behaviour of distressed firms in the M&A market. Especially when it comes to the differences between industries. It builds on existing theories and provides empirical evidence that can serve as a source for further academic research.

Societal Relevance: This thesis could prove useful to society. As bankruptcies increase (Consultancy.uk, 2024), understanding how industry specific distressed firms use M&A as a strategy can help firms stay active. This can contribute to economic stability by preventing bankruptcies that may include layoffs.

Industrial Relevance: This thesis could be helpful to managers in the decision-making process during financial distress. By highlighting industry-specific differences between acquisition characteristics,

this research can guide firms in optimizing their investment portfolios and improving their chances of survival.

6.3 Research Gaps

This thesis provides a broad overview of industry specific M&A deals. Further researches could delve deeper into how individual industries and their specific characteristics that influence the strategy of a distressed firm. Including qualitative research, such as interviews with managers, to further understand their motives and considerations. This thesis covers data from 2010 to 2023. Considering a smaller specified time frame could obtain more relevant results. Further research may also explore how regulatory changes affect acquisition decisions by distressed acquirors.

CHAPTER 7 Conclusion

This thesis has looked at the expected values of deal characteristics in the mergers and acquisitions market, and how they are influenced by the financial state of the acquiring firm. Previous research has shown the existence of a positive relationship between acquisitions and diversification of financial risk, suggesting that firms dealing with financial distress might pivot to an investment strategy that is more focused on external expansion. Although the literature is saturated with knowledge about acquisitions *of* distressed assets, the research into the theories behind acquisitions *by* distressed firms has been rather scarce. Especially when it comes to deal characteristics involving a financially distressed acquiror. This highlights the importance of the topic, as investment decisions become particularly critical during a time of financial distress. The most effective way to distinguish between acquirors is to categorize all firms into specific industries, making the results directly implementable in real life scenario's. With the aim of addressing the mentioned research gap, the question was explored on How the industry sector affect the expected characteristics of a firm's merger & acquisition deals in a period of financial distress?

To answer this question, over 9000 different deals in the merger and acquisition market were analysed and tested for their specific characteristics. The acquiror of every deal has their personally calculated financial status, determined by several accounting ratios, resulting in the Altman Z-score, The testing involved conducting over 170 mean-difference tests and a regression analysis, containing acquirors from nearly all industries. The purpose of testing is to determine if there are significant differences within industries and between distressed and non-distressed acquirors in those industries.

This study concludes by showing that there are significant differences in the expected value of deal characteristics. Acquirors in specific industries are expected to have different values of deal characteristics than acquirors in other industries. Although the literature shows that acquisition is a risk-diversifying strategy, this may not be the optimal route for firms in every industry. By learning from these differences, potential acquirors can make more informed decisions about their investment strategies. Secondly, learning from these differences can help adapt their strategies to the context of their specific industries, and hopefully achieve better outcomes in acquisition deals as a result.

REFERENCES

Alparslan, V. (2020). Mergers and acquisitions in the transportation and logistics sector: a sustainable value creation or aware value destruction? (Doctoral dissertation, WHU-Otto Beisheim School of Management).

Altman, E. I. (1968). FINANCIAL RATIOS, DISCRIMINANT ANALYSIS AND THE PREDICTION OF CORPORATE BANKRUPTCY. *the Journal of Finance*, *23*(4), 589–609. https://doi.org/10.1111/j.1540-6261.1968.tb00843.x

Altman, E. I. (2013). Predicting financial distress of companies: revisiting the Z-Score and ZETA® models. In Edward Elgar Publishing eBooks. https://doi.org/10.4337/9780857936080.00027

Álvarez-González, P., & Otero-Neira, C. (2022). Mergers and acquisitions success: examining customer loyalty. Marketing Intelligence & Planning, 41(1), 48–61. https://doi.org/10.1108/mip-02-2022-0074

Barham B., & Coomes, O. (2005). Sunk costs, resource mining industry, and development outcomes. In P. Ciccantell, D. Smith & G. Seidman (Eds.) Nature, raw materials, and political economy. (pp. 159-186). London: Emerald Group Publishing Limited.

Barnes, N. G. (2002). Mergers and Acquisitions as the New Growth Strategy: A Case Study of the Wholesale Alcohol Industry. American Business Review, 20(2).

Bhojraj, S., Lee, C. M., & Oler, D. (2002). What's my line? A comparison of industry classification schemes for capital market research. Social Science Research Network. https://doi.org/10.2139/ssrn.356840

Bruyland, E., Lasfer, M., De Maeseneire, W., & Song, W. (2019). The performance of acquisitions by high default risk bidders. Journal of Banking & Finance, 101, 37–58. https://doi.org/10.1016/j.jbankfin.2019.01.019

Capron, L. (1999). The long-term performance of horizontal acquisitions. Strategic Management Journal, 20(11), 987-1018. doi:10.1002/(SICI)1097-0266(199911)20:113.0.CO;2-B

Cárdenas, F. (2023). The rewards and risks of a cross-border mergers and acquisitions. EGADE. https://egade.tec.mx/en/egade-ideas/reports/rewards-and-risks-cross-border-mergers-and-acquisitions

Consultancy.uk. (2024, February 26). Number of distressed companies rises in UK. *consultancy.uk*. https://www.consultancy.uk/news/36624/number-of-distressed-companies-rises-in-uk

DePamphilis, D. (2010). *Mergers and acquisitions basics: all you need to know*. Academic Press.

di Giovanni, J. (2005). What drives capital flows? the case of cross-border M&A activity and financial deepening. Journal of International Economics, 65(1), 127-149. doi:10.1016/j.jinteco.2003.11.00

EHSO. (2014). SIC Code List. EHSO. Retrieved from https://www.ehso.com/siccodes.php

Farrell, J., & Shapiro, C. (2001). Scale economies and synergies in horizontal merger analysis. Antitrust Law Journal, 685-710.

Fernando, J. (2024). Current ratio explained with formula and examples. Investopedia. https://www.investopedia.com/terms/c/currentratio.asp

Fluck, Z., & Lynch, A. W. (1999). Why Do Firms Merge and Then Divest? A Theory of Financial Synergy. The Journal of Business, 72(3), 319–346. https://doi.org/10.1086/209617

Gaughan, P. A. (2010). Mergers, acquisitions, and corporate restructurings (6th ed.). John Wiley & Sons.

Gaughan, P. A. (2013). *Maximizing corporate value through mergers and acquisitions: A strategic growth guide*. John Wiley & Sons.

Gordon, M. J. (1971). Towards a theory of financial distress. *The journal of finance*, *26*(2), 347-356.

Grubel, H. G. (1968). Internationally diversified portfolios: Welfare gains and capital flows. The American Economic Review, 58(5), 1299-1314.

Habib, A., Costa, M. D., Huang, H. J., Bhuiyan, M. B. U., & Sun, L. (2018). Determinants and consequences of financial distress: review of the empirical literature. Accounting and Finance, 60(S1), 1023–1075. https://doi.org/10.1111/acfi.12400

Hardy, M. A. (1993). *Regression with dummy variables* (No. 93). Sage.

Hargrave, M. (2023, July 20). Winsorized mean: formula, examples and meaning. Investopedia. https://www.investopedia.com/terms/w/winsorized_mean.asp

Hotchkiss, E. S., & Mooradian, R. M. (1998). Acquisitions as a means of restructuring firms in Chapter 11. *Journal of Financial Intermediation*, *7*(3), 240–262. https://doi.org/10.1006/jfin.1998.0243

Hubbard, R. G., & Palia, D. (1999). A reexamination of the conglomerate merger wave in the 1960s: An Internal Capital Markets view. the Journal of Finance/the Journal of Finance, 54(3), 1131–1152. https://doi.org/10.1111/0022-1082.00139

Iyer, D. N., & Miller, K. D. (2008). PERFORMANCE FEEDBACK, SLACK, AND THE TIMING OF ACQUISITIONS. *Academy of Management Journal*, *51*(4), 808–822. https://doi.org/10.5465/amj.2008.33666024 Journal, 55(4), 5–16. http://www.jstor.org/stable/4480178

Kim T. K. (2015). T test as a parametric statistic. Korean journal of anesthesiology, 68(6), 540–546. https://doi.org/10.4097/kjae.2015.68.6.540

Kox, H. L. M. (2002). Growth challenges for the Dutch business services industry. CPB Netherlands Bureau for Economic Policy Analysis. https://www.cpb.nl/sites/default/files/publicaties/download/growth-challenges-dutch-business-services-industry-international-comparison-and-policy.pdf

Leland, H.E., (2007). Financial Synergies and the Optimal scope of the firm: Implications for mergers, spinoffs, and Structured Finance. J. Finance 62, 765–807.

Levy, H., & Sarnat, M. (1970). DIVERSIFICATION, PORTFOLIO ANALYSIS AND THE
UNEASY CASE FOR CONGLOMERATE MERGERS. *the Journal of Finance (New York. Print)*, *25*(4), 795–802. https://doi.org/10.1111/j.1540-6261.1970.tb00553.x

Lewellen, W. G. (1971). A PURE FINANCIAL RATIONALE FOR THE CONGLOMERATE
MERGER. ˜ the œJournal of Finance/˜ the œJournal of Finance, 26(2), 521–537.
https://doi.org/10.1111/j.1540-6261.1971.tb00912.x

M&A Community Portal. (2024, April 2). Cash vs Stock in Mergers and Acquisitions Explained.

Markowitz, H. M. (1991). Foundations of Portfolio Theory. The Journal of Finance, 46(2), 469–477.

Markowitz, H. M. (1999). The Early History of Portfolio Theory: 1600-1960. Financial Analysts

Meier, J., & Servaes, H. (2019). The bright side of fire sales. *Review of Financial Studies/the Review
of Financial Studies*, *32*(11), 4228–4270.
https://doi.org/10.1093/rfs/hhz019

Nejadmalayeri, A., & Rosenblum, A. (2022). Distressed acquirers and the bright side of financial
distress. International Review of Financial Analysis (Online)/International Review of
Financial Analysis, 83, 102303. https://doi.org/10.1016/j.irfa.2022.102303

Noga, T. J., and A. L. Schnader, 2013, Book-tax differences as an indicator of financial distress,
Accounting Horizons 27, 469–489

North American Industry Classification System - naics@census.gov. (n.d.). North American Industry
Classification System (NAICS) main page U.S. Census Bureau.
https://web.archive.org/web/20140930040808/http://www.census.gov/eos/www/naics/

Palepu, K. G. (1986). Predicting takeover targets. Journal of Accounting & Economics/Journal of
Accounting and Economics, 8(1), 3–35. https://doi.org/10.1016/0165-4101(86)90008-x

Porter, M. E., & Strategy, C. (1980). Techniques for analyzing industries and competitors. *Competitive
Strategy. New York: Free*.

Ryan, T. P. (2008). Modern regression methods (Vol. 655). John Wiley & Sons.

Saidu, B. (2007). How taxes, royalties, and fiscal regime stability affect mining investment: a
comparison of Niger and Indonesia. The Journal of Structured Finance, 13(3), 105-111.

Schoenberg, R., & Reeves, R. (1999). What determines acquisition activity within an industry?
European Management Journal, 17(1), 93–98. https://doi.org/10.1016/s0263-2373(98)00066-8

Swinnen, J. F. M., & Vranken, L. (2009, January 21). Land & EU Accession: Review of the
transitional restrictions by new member states on the acquisition of agricultural real estate.
https://deliverypdf.ssrn.com/delivery.php?ID=

Trautwein, F. (1990). Merger motives and merger prescriptions. *Strategic management journal*, *11*(4),
283-295. https://doi.org/10.1002/smj.4250110404

Weston, J. Fred. (1970). The nature and significance of conglomerate firms. *St. John's Law Review,
44(Special Edition),* 66-80.

Whitaker, R. B. (1999). The early stages of financial distress. *Journal of economics and finance*, *23*(2), 123-132.

Ye, M., Lu, W., Flanagan, R., & Ye, K. (2017). Diversification in the international construction business. Construction Management & Economics, 36(6), 348–361. https://doi.org/10.1080/01446193.2017.1388530

Yim, K. H., Nahm, F. S., Han, K. A., & Park, S. Y. (2010). Analysis of statistical methods and errors in the articles published in the Korean journal of pain. The Korean journal of pain, 23(1), 35.

Zhang, E. Q. (2022). Why are distressed firms acquisitive? *Journal of Corporate Finance*, *72*, 102126. https://doi.org/10.1016/j.jcorpfin.2021.102126

Zhang, W., 2015, R&D investment and distress risk, Journal of Empirical Finance 32, 94–114.

Zhou, K., Yan, R., & Liu, Y. (2019). Vertical merger, R&D collaboration and innovation. The European Journal of Finance, 25(14), 1289-1308. doi:10.1080/1351847X.2019.1589551

APPENDIX A [White tests for Heteroscedasticity]

(1) Log(deal value),
White's test
H0: Homoskedasticity   Ha: Unrestricted heteroskedasticity
  chi2(15) = 91.01
Prob > chi2 = 0.0000
H0 of constant variance can be rejected at a 5% level of significance. There is heteroscedasticity in the residuals. Robust standard errors are required.

(2) Deal value/acquiror total assets,
White's test
H0: Homoskedasticity   Ha: Unrestricted heteroskedasticity
  chi2(15) = 10.26
Prob > chi2 = 0.8030
H0 of constant variance can not be rejected at a 5% level of significance. There is not a significant amount of heteroscedasticity in the residuals. Robust standard errors are not required.

(3) Cash payment (in percentage),
White's test
H0: Homoskedasticity   Ha: Unrestricted heteroskedasticity
  chi2(15) = 55.76
Prob > chi2 = 0.0000
H0 of constant variance can be rejected at a 5% level of significance. There is heteroscedasticity in the residuals. Robust standard errors are required.

(4) Group diversifying dummy,
White's test
H0: Homoskedasticity   Ha: Unrestricted heteroskedasticity
  chi2(15) = 551.56
Prob > chi2 = 0.0000
H0 of constant variance can be rejected at a 5% level of significance. There is heteroscedasticity in the residuals. Robust standard errors are required.

(5) Industry diversifying dummy
White's test
H0: Homoskedasticity   Ha: Unrestricted heteroskedasticity
  chi2(15) = 226.81
Prob > chi2 = 0.0000
H0 of constant variance can be rejected at a 5% level of significance. There is heteroscedasticity in the residuals. Robust standard errors are required.

(6) Cross border diversifying dummy
White's test
H0: Homoskedasticity   Ha: Unrestricted heteroskedasticity
  chi2(15) = 89.49
Prob > chi2 = 0.0000
H0 of constant variance can be rejected at a 5% level of significance. There is heteroscedasticity in the residuals. Robust standard errors are required.