Effectiveness of Turnaround and Restructuring Initiatives: A Sector-Specific Analysis in the US Market

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Abstract

This dissertation delves into the dynamics of the restructuring and turnaround initiatives made by the US firms from January 2000 until December 2022. The objective of this thesis is to understand if the strategies adopted by the 1.848 distressed companies observed have been effective in the recovery process and which are the differences between the different sectors. Utilizing, at first, a logit regression model, the dissertation aims to understand if and how the strategies considered affected the probability of recovery of the firms. Once the relationship has been established, a linear regression model, that look at the change in the Z-score, has been used to capture the magnitude of the effect caused by the restructuring processes. The findings highlight that, in most of the cases, the restructuring strategies adopted tend to have more a negative rather than a positive effect on the probability of recovering. The magnitude of the strategies, instead, tend to vary among the different industries with some sectors that show quite an important detrimental effect of some restructuring initiatives. To better comprehend in overall terms how the different turnaround processes influenced the US market, both regressions have been run with all the sample, obtaining results in line with what obtained in the sector-specific analyses, with some minor differences. This thesis contributes to the study of the turnaround mechanism, with the goal of helping future research to achieve results that might be the starting point of the managerial decisions that are crucial in periods of distress.

Key Words: Financial Distress, Turnaround, Restructuring, Z-score, Logistic Regression, Linear Regression, Recovery, US Market**.**

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Resumo

Esta dissertação explora a dinâmica das iniciativas de reestruturação e recuperação realizadas pelas empresas dos Estados Unidos de janeiro de 2000 a dezembro de 2022. O objetivo desta tese é compreender se as estratégias adotadas pelas 1.848 empresas em dificuldades observadas foram eficazes no processo de recuperação e quais são as diferenças entre os diferentes setores. Utilizando inicialmente um modelo de regressão logística, a dissertação visa entender se e como as estratégias consideradas afetaram a probabilidade de recuperação das empresas. Uma vez estabelecida a relação, um modelo de regressão linear, que analisa a mudança no Z-score, foi utilizado para capturar a magnitude do efeito causado pelos processos de reestruturação. Os resultados destacam que na maioria dos casos as estratégias de reestruturação adotadas tendem a ter mais um efeito negativo do que positivo sobre a probabilidade de recuperação. A magnitude das estratégias, por outro lado, tende a variar entre as diferentes indústrias, com alguns setores que mostram um efeito prejudicial bastante importante de algumas iniciativas de reestruturação. Para melhor compreender em termos gerais como os diferentes processos de recuperação influenciaram o mercado dos EUA, ambas as regressões foram executadas com toda a amostra, obtendo resultados em linha com os obtidos nas análises separadas, com algumas diferenças menores. Esta tese contribui para o estudo do mecanismo de recuperação, com o objetivo final de ajudar futuras pesquisas a alcançar resultados importantes que possam ser o ponto de partida para as decisões gerenciais cruciais em períodos de dificuldades.

Palavras-chave: Dificuldades financeiras, reestruturação, reorganização, Z-score, regressão logística, regressão linear, recuperação, mercado dos Estados Unidos.

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1. Introduction and problem definition

1.1 Research Problem

Considering the constantly changing landscape of the global business arena, the adaptability and resilience of the corporations, face continuous threat. In the past 20 years, financial crises, economic downturns, and a world-wide pandemic constantly put under pressure the firms, regardless of the industry, country, and company size. Given the though period we are going through and the myriad of challenges that corporate world is facing, the ability of the firms to avoid failure and to take the right choices to get out of the swamp in case of need is becoming increasingly important.

Right in this framework, emerges a fascinating phenomenon, the corporate restructuring and turnaround. This complex practice has the object to not only revive ailing enterprises, but even to push them towards newfound vitality and sustainability.

The strategies that have been adopted from the corporate world have been numerous and different one from the other. Already in 1932, research conducted by Shmalenbach, examined the differences of the financing aspects to corporate restructuring strategies. Since then, the research on the topic has expanded and gained more and more importance with the increasing number of strategies that might be applied, also thanks to the development of new financial instruments and concepts.

With the growth of the importance of the topic, the debate about the right path that the firms must pursue in case of distress has become intense, therefore receiving noticeable attentions in the literature of the finance world. (Lin et al., 2006) (Sudarsanam & Lai, 2001).

Notwithstanding the increase of the research on the matter, there is still a lack of cohesive theory about the restructuring process of the corporate world (Castrogiovanni and Bruton, 2000), and even a bigger lack of empirical evidence that can show the effectiveness of the different turnaround strategies. Consequently, the results that might be derived from research in this particular field, is not only academic oriented, but can also be of practical significance for business leaders and owners, as well as for investors and policymakers. It holds the premises of providing valuable insights into how new and mature firms successfully adapt, evolve and thrive in a business landscape that is as competitive as never before.

Throughout this thesis we will embark on a meticulous journey into the wide range of turnaround strategies that are available to the firms that are facing periods of financial distress. The primary objective is not just to enumerate these strategies, but to extensively define each one, considering all the positive and negative aspects that come with them. This study will involve a retrospective examination of the results achieved by the companies that undertook the various restructuring strategies in the past years. By looking at a multitude of literature, case studies and empirical data, we aim to define if there is a clear strategy or a combination of them that can identify the path that firms can take to overcome financial distress.

1.2 Research Objective

This dissertation endeavors to contribute to the scholarly literature within the domain of corporate strategies and turnaround effectiveness. It is poised to offer insights that could prove instrumental for future research, thereby enriching the corporate landscape by evaluating the efficacy of diverse strategies employed by firms to navigate turbulent periods.

The primary objective of this thesis is to ascertain the existence of a universally applicable strategy, independent of industry considerations, that yields positive outcomes regardless of the sector. Additionally, it aims to examine whether certain strategies, despite being widely adopted by distressed firms, have detrimental effects on the likelihood of recovery.

It is imperative to meticulously analyze both positive and negative outcomes as they can significantly inform the decision-making process. By doing so, this research endeavors to provide valuable guidance to practitioners and scholars alike in navigating the complexities of corporate strategy and turnaround management.

1.3 Expected-Contribution

The expected contribution of this thesis is to go beyond the established literature by delving deeply and innovatively into the diverse array of turnaround mechanisms across various organizations. Unlike prior studies, which predominantly focused on the overarching dynamics within the US market, this research adopts a nuanced approach, recognizing the profound discrepancies that exist among firms across different sectors.

Historically, seminal works such as Sudarsanam & Lai (2001) and Smith and Graves (2005) mainly examined this phenomenon through the lens of a broad sample of firms, neglecting the intricate variations that may come from distinct operating models and organizational structures. (Pearce, 1993)

By contrast, this thesis seeks to fill this critical gap by scrutinizing how different companies, characterized by vastly divergent business operations and structures, respond to turnaround strategies.

Through meticulous analysis and comparison, this research aims to unearth the different outcomes and efficacy of various turnaround mechanisms across disparate sectors. However, despite the interesting factors of having a diverse range of sectors and industries that can reach potentially substantial different outcomes, it is necessary to have a minimum level of homogeneity within the overall sample to reach unbiased conclusions. (Bryman & Bell, 2022)

This is mainly the reason why it was necessary to follow what have been already established by precedent literature for Finance and Insurance sectors as they have not been included in this research, due to the regulatory implications that one should estimate and account for in the final results.

Overall, this research aims to set the stage for the subsequent empirical analysis and discussion, highlighting the expected contributions of the thesis to both academic scholarship and practical implications for corporate restructuring practices.

2. Literature review

2.1 Corporate Crisis

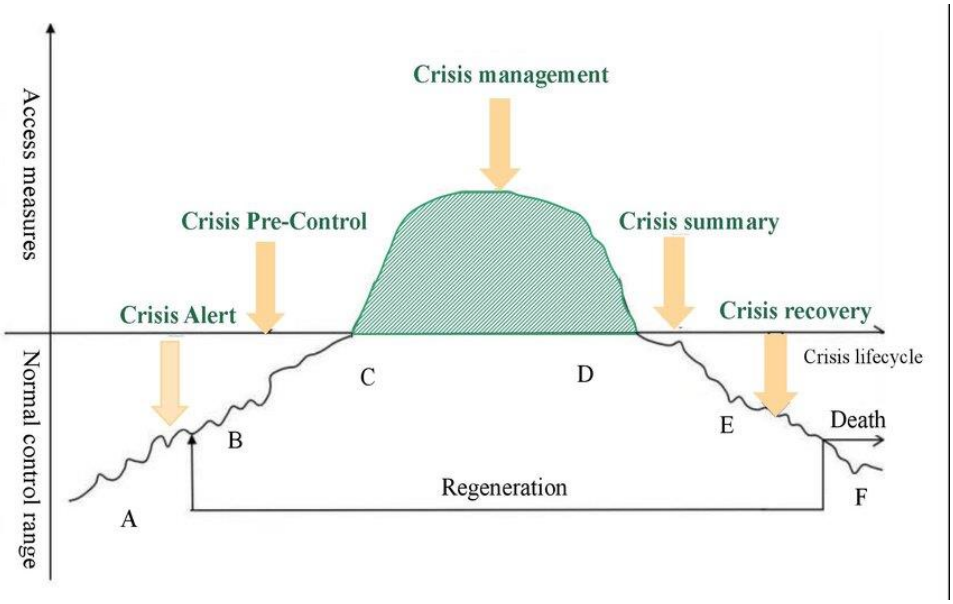
Examining research on corporate crises is crucial for identifying recurring patterns in crisis progression. This analysis is pivotal for implementing effective strategies during corporate turnarounds, as each phase necessitates tailored interventions to address specific challenges. Various models have been developed by scholars such as Müller (1985), Weitzel & Jonsson (1989) and (Slatter et al., 1999). These models may differ in their delineation of corporate objectives and in examining how companies behave throughout the crisis process and the level of risk they face (Müller, 1985).

In the realm of turnaround research, it's essential to compare companies that are in similar stages of distress. To comprehend the cause-and-effect dynamics during a corporate crisis, the initial step involves analyzing and investigating the underlying causes. Causes which can be classified into two main categories: *origin of distress* and *nature of distress*. Internal factors may stem from poor management or inadequate financial controls, while external factors often arise from heightened competition leading to a decline in demand (Balgobin & Pandit, 2001). Distress can also be categorized as operational, reflecting operational or strategic inefficiencies, primarily influenced by external factors such as market position (Pretorius, 2010).

Furthermore, researchers distinguish between qualitative and quantitative approaches to analyze corporate crises. Quantitative analyses involve statistical examination of the causes which led the company to the crisis, yet they may struggle to clearly differentiate between symptoms and root causes. Conversely, qualitative research attempts to draw broad conclusions about financial distress through surveys, but such data is often limited in accessibility or biased (Pretorius, 2010).

In summary, understanding the complex nature of corporate crises involves grappling with multifaceted causal relationships, multi-stage progressions, and the challenge of isolating a singular origin of financial distress.

Figure 1: Dynamic development process of a corporate crisis



2.2 Corporate distress

Distress in a business context, is defined by Chen et al. (1995) as a condition in which the value that is obtained from the liquidation of all the firm's assets is not sufficient to cover the total value of claims made by the creditors. In simpler terms, is a financial condition where the company's liabilities are worth more than the total value of the assets. This situation is often the signal of a persistent financial instability that, if prolonged, can lead the firm to file for bankruptcy. That is the reason why main part of the existent literature on the topic, refers to financial distress by considering the potential bankruptcy risk, that is dependent on the availability of liquidity and credit (Hendel, 1996). As a matter of fact, the ability of a firm to recognize the distress situation has a key role on the likelihood to get out of the crisis, by responding immediately and taking the right measures or strategies that can enhance efficiency and cost reduction. One possible solution to calculate the distress probability is the Merton model (Merton, 1974), that is a measure that consider a company's distance to default. The more a firm is decreasing the distance-to-default metrics, the more this suggest that is approaching to default, while an increase of the metrics is a signal of that the firm is less likely to default. Another measure that is often used by the researchers is an accounting - based model, which means that is highly reliant on companies' accounting information, is the Altman Z-Score developed by Altman (1968) which states that the greater the z-score, the lower is the

probability of default. Usually, the Z-score is used as one of the main indicators to identify a firm's distress and its severity level (Smith & Graves, 2005). The concept of the measure is based on several accounting ratios, that are summed together with a specific weight for each of them. Even though the Altman model has been revised and extensively modified to adapt it to the constantly changing business world, it is still considered one of the most valid instruments to predict the distress and bankruptcy likelihood (Altman et al., 2014).

2.3 Turnaround strategies

The moment the financial distress is detected by the firm, is where the most delicate decisions are taken.
Management has the option to wait and hope for an upturn of the business or take the lead of restructuring. If the second path is chosen, the decisions will ultimately dictate the company's future.

Even though there is no clear definition of the corporate turnaround, the literature describes it as a process that has as objective the transformation of an unprofitable firm into a profitable one (Schmitt, 2009). Different classifications of restructuring have already been recognized in the past literature, but we will rely on Sudarsanam & Lai's (2001) classification. Specifically, the four strategies we will analyse are *managerial restructuring, operational restructuring, asset restructuring and financial restructuring.*

2.3.1 Managerial restructuring

When the financial distress arises in a firm, the changes in the top management are the first tangible evidence to banks, investors, and employees that something is being done to address the problems and improve the general conditions of the organization, even though the problems are often way beyond management's control (St P Slatter, 1984). As a matter of fact, Kruse (2000) found that 36% of their sample firms experienced disciplinary turnover in their top executive by the end of the third year following the year of poor performance. Even though this seems to be the most viable path in a company's restructuring, the stock market reaction to these changes is not always clear, as in certain cases is positive, in other neutral but in some cases is even considered by the market as a negative sign (Bonnier & Bruner, 1989) (Khanna & Poulsen, 1995) (Warner et al., 1988). Even though this change is often perceived as fresh air inside the firm that can positively change the company's internal climate (Yawson, 2009), the

real effectiveness of managerial restructuring in turnaround is yet to be conclusively established (Sudarsanam & Lai, 2001).

2.3.2 Operational restructuring

This kind of reorganization has the objective to restore or increase the profitability of a certain firm by implementing a list of changes with the objective of cutting unnecessary costs and reducing overheads through the sale of fixed assets that are not generating enough value, like lands, equipment, and offices (Koh et al., 2015). Given the nature of this strategy, is easy to understand that this is the first step that financially distressed firms take in order to have a rapid overcome of the crisis (Hofer, 1980). As a matter of fact, firms through this strategy have the primary objective to rapidly raise up cash and increase efficiency, although it needs to be recognized that this is prevalently a short-term strategy. Distress is usually coming from deeper causes therefore this approach if not used in combination with other strategies, might not be sufficient in the long term (Sudarsanam & Lai, 2001). Moreover, this strategy becomes imperative when a company is operating below the maximum capacity to improve utilization and productivity of the existing assets. (Hofer, 1980; Schendel & Patton, 1975). In summary, the strategy is a rapid way for managers to achieve short-term profitability, and to have a more strategic use of the resources (Smith & Graves, 2005). In the turnaround process, operational restructuring has been associated with a positive outcome of the process, even though still need to be empirical tested whether this kind of restructuring leads to recovery from potential bankruptcy (Sudarsanam & Lai, 2001).

2.3.3 Asset restructuring

The asset restructuring strategy, that might be identified as portfolio restructuring is an approach that covers a wide range of actions. It can comprise differentiation of the various strategic business units of the firm, divestment of non-core businesses, acquisition of companies that are more core-related, create alliances and joint venture but can also be a more invasive strategy through the so-called distressed M&A or through the management buyouts (MBO). On a wider range, we can identify the strategy in two macro-approaches: Asset investment and Asset divestment. (Sudarsanam & Lai, 2001).

Asset divestment: This approach is mainly used in case of severe distress, where the main objective is to divest the non-core and sometimes even profitable business lines with the main goal of raising cash to survive the crisis in the short-term (Sudarsanam & Lai, 2001). Due to the simpleness of this approach, the asset divestment is the most common strategy used by distressed small and medium size company (Slatter, 1984).

Asset investment: This second macro-strategy, is usually applied by firms not in severe distress. Most of the times, it is used in combination with the previously mentioned operational restructuring, as it can not only help to increase the competitive advantage of the firm, but can also lead to a great reduction of costs through economies of scale (Sudarsanam & Lai, 2001). Moreover, it can be used to assess problems related to declining markets/sectors, through acquisitions that can be appropriate to guarantee the long-term success of the company. (Schendel & Patton, 1975; Hofer, 1980).

2.3.4 Financial restructuring

Financial restructuring is a complex way to reorganize a firm, as it often includes changes to its capital structure as well as the reconfiguring of the dividend policy.

The literature doesn't completely agree on the fact of considering this type of restructuring as a turnaround strategy. As a matter of fact, the strategy-based research doesn't give to this strategy enough importance to be considered as an integral part of the turnaround strategies. At the opposite the finance-based research believes the financial restructuring to be a necessary strategy for a successful turnaround. (DeAngelo & DeAngelo, 1990; Franks & Torous, 1993)

In this research I will follow the approach of Sudarsanam & Lai (2001) considering the financial restructuring as an integral part of the study and evaluate the importance.

This strategy can be divided into two main approaches: *equity-based* and *debt-based* approach. With equity-based approach we consider actions like dividend cuts or omissions, and equity issues in different forms (e.g. rights issue, public offer or institutional placing). DeAngelo & DeAngelo (1990) found that for large firms, a dividend cuts or omission is the main strategy that is likely to be used in case of financial distress.

Debt-based financial restructuring is the pure restructure of the debt. This strategy is pursued by firms, that are on the edge of a deep financial distress and financial liquidity crisis. Gilson (1989) refers to a debt restructuring process as a transaction where existing debt is replaced by a new contract that have at least one of these 3 characteristics: Interest or principal reduces; extension of the maturity; a debt-equity swap.

3. Data

The data collected and used to understand which were the distressed firms, which were the strategies applied and in general for all the analysis made during the research, have been gathered from the Wharton Research Data Services (WRDS), specifically has been used the data set that unify Compustat and the Center for Research in Security Prices (CRSP) databases. The timespan selected for the research is the period from January 2000 to December 2022 (that was the most recent year available in the database), with all the data measured annually. After the collection of the figures, each company have been attributed to its respective industry, through the utilization of the SIC Codes, available on the Kenneth R. French Data Library. The initial sample selected is formed by only 11 Industry of the 12 presented on the Data Library, as Finance industry have been excluded due to the regulation and specificness of the sector. (Koh et al., 2015)

The first step made in the data cleaning process, was to select only the publicly listed companies that are listed in the New York Stock Exchange (11), American Stock Exchange (12), NASDAQ-NMS Stock Market (14) and Boston Stock Exchange (15), with the relative codes in the parentheses. This selection was mainly made in order to have access to full financial information and to obtain a data set with the least possible amount of missing informations. To get a more homogeneous sample of data, different researcher adopted various corrections, like removing all the firms with a market capitalization below €10 million (Sudarsanam & Lai, 2001) or removing the biggest and smallest 5% of the firms (Koh et al., 2015), but we adopted the choice of removing the firms with total assets that were below €50 million, in order to not only get a more homogeneous sample but even to select firms that more likely have no missing data. Finally, to ensure that all the results that will be computed based on these data are not biased, we deleted all the firms that had any missing data.

Moreover, since we wanted to analyze all the process of the restructuring, we deleted all the firms that didn't have a continuous coverage of at least 5 years, as part of analysis was made looking at the two pre-distress and post-distress years, referred to as *t-2* and *t+2*.

After all the modification have been made on the sample, we have computed the Z-score for each firm for every year. Using the Altman's Z-score and the concept developed by Sudarsanam & Lai, defined in the methodology part, we identified the financially distressed firms that are the focus of this study.

Finally, the initial sample size was made by a total of 11.636 of firms, out of these only 7.934 respected all the minimum requirement initially set to have a clean and homogeneous dataset. From this bigger sample, have been selected just the firms that satisfied at least once the condition used for the identification of the distress reaching an ultimate sample of 1.848 companies.

Table 1: Distribution of the sample between the 11 industries

Industry	***Final sample***
Business equipment	*467*
Chemicals and Allied products	*52*
Consumer Durables	*35*
Consumer non durables	*95*
Healthcare	*326*
Manufacturing	*185*
Oil & Gas	*157*
Other	*313*
Telephone and television	*76*
Utilities	*34*
Wholesale & Retail	*108*
Total sample size	***1848***

4. Methodology

4.1 Overview

This section will discuss about the methodology adopted in the research to analyze the data. It will delineate the tools, techniques and procedures to obtain empirical evidence of the effectiveness of the different restructuring strategies that can be adopted by the companies in distress.

As previously mentioned, the research is based on pure accounting information and performance measures as well as on proxies used to put in to an accounting perspective the variables that will be considered during the empirical work.

The analysis will evolve around three key periods: *Pre distress*, *distress year* and *post-distress*. In this way, will be possible to have outputs that can be compared giving a better comprehension of the results.

Specifically, in the first section will be described the proxy considered for the identification of the distress, the Altman's Z-score and its utilization. In the second section, will be described the two dependent variables that have been used and the kind of statistical tools applied in the research problem. The third section elaborates on how the independent variables are chosen as well as the context variables.

4.2 Identification of the distress

As mentioned in the literature review, many methods have been adopted by the scholars to identify and predict the distress or the potential distress of a firm. The application that this research follows, is the one related to the accounting-based model Altman's Z-score. Notwithstanding the evolution of different Z-score over the years, the one developed by Altman is still considered one of the most valid among the others (Altman et al., 2014).

Specifically, the formula used for the computation of the Z-score is the following:

$$Z\text{-}score = 1{,}2 * X1 + 1{,}4 * X2 + 3{,}3 * X3 + 0{,}6 * X3 + 1 * X4$$

Where:

$$X1 = \frac{Working\ capital}{Total\ assets}$$

$$X2 = \frac{Retained\ Earnings}{Total\ assets}$$

$$X3 = \frac{Earnings\ before\ interest\ and\ taxes}{Total\ assets}$$

$$X4 = \frac{Market\ value\ of\ equity}{Book\ value\ of\ total\ liabilities}$$

$$X5 = \frac{Sales}{Total\ assets}$$

Z = Overall Index

The model implies that a company is considered in distress if the Z-score is below 1,8. Additionally, for the identification of the distress, following Sudarsanam & Lai (2001) approach, a company will have to satisfy the so-called + + - rule, which means that a company is considered as financially distressed if the overall index have a value of less than 1,8 after at least two years of a Z-score higher than 1,8. Therefore, only the company that satisfied this condition were selected.

4.3 Dependent variables

To reach the principal goal of this research, namely the understanding of how the different restructuring process affect the probability of recovering for the identified distressed firms, the dependent variables used have to be linked to the results achieved by the companies that undertook those strategies.

The first dependent variable used, in fact, is a dummy that represents the value of 1 if the firm recovered and 0 otherwise. The utilization of a dummy as a dependent variable for Hoetker (2007) is a great asset in terms of the distribution as the initial probability is always depending on any changes in the independent variables being the value of a dummy restricted to the interval (0,1). This approach implies that the statistical model that needs to be used is a multivariate logistic regression. Consequently, to this approach, was necessary to solve a major

limitation of this model, that is related to the interpretation of the results as the coefficient only represents the sign (its direction) and the statistical significance. (Hoetker, 2007)

Therefore, to better comprehend the results, was substantially important to create a new regression model that could capture the intensity and magnitude of the strategy and not only its direction.
To assess this problem, it was created a new dependent variable that is directly associated to the performance of the firm.

The approach chosen is the one that has already been used by Sudarsanam and Lai (2001), which is computing the change in the Z-score of each firm in the sample between the distress year and two years post distress. Having the changes in the Z-score as dependent variable, now allow us to use a multivariate linear regression model whose coefficient let us understand better the results as they would represent by how much the Z-score varies when followed by any variation of the independent variables. In this way was possible to get an idea of the magnitude and therefore the real efficiency of the different variables restructuring strategies. (Sudarsanam & Lai, 2001)

4.4 Independent variables and context variables

To understand which strategies have been adopted by the firms to recover from distress, during the research have been identified some proxies that embody the restructuring strategies. These proxies are the ones that will be the independent variables in the regression.

4.4.1 Managerial restructuring

Managerial restructuring is the first strategy that has been mentioned in this research, as is one of the most immediate changes that firms can make to increase trust among investors. As a matter of fact, Kruse (2000), found that 36% of the firms experienced disciplinary turnover in their top executive by the end of the third year following the year of poor performance. Specifically, for managerial turnover is considered the nonroutine turnover. This means that are considered only the changes in the firms' top executive that are not related to events like death, illness or the normal retirement (Denis & Denis, 1995). However, since for this research there is a limited access to the sources that can identify the changes in the top management under these specific conditions, this strategy has not been considered. Hence, this is the first limitation of the research, that will be discussed in the *Limitations* part of the thesis. Precedent literature modeled this restructuring strategy as a dummy variable.

4.4.2 Operational Restructuring

Focusing on operational restructuring is essential in a turnaround process, as such events are often able to affect company's operations, organizational functions, existing management structures and business strategies (Lin et al., 2008).

In this research, two strategies have been considered: *Cost-cutting* and *Assets Efficiency.*

Cost-cutting strategy is often the first step that a firm take to return to profitability (Lin et al., 2008). Usually, the cost-control is referring to labor costs, production costs, SG&A and R&D expenses (Kruse, 2000). In this research the proxy considered in this case is the changes in the expenses of the firm, specifically any decrease of more than 10% will be considered as a restructuring. The 10% limit is intended to capture any non-routine changes.

On the other side, the second proxy considered for the operational restructuring is the *Assets efficiency*, which means any changes in the operating strategies that increase the efficiency of the already existing assets in the firm. Therefore, is crucial to adapt the changes in the revenue for any changes in the fixed assets of the firm, to consider only the growth in the revenue that is given by any form of operational reorganization, rather than an increase that is led by a contextual increment of the long-term assets under the firm's control. Also in this case, a limit of a minimum of 5% increase has been set with the purpose of considering a significant increment and not only a marginal growth.

4.4.3 Financial Restructuring

Following precedent literature, the proxies used for the *Financial Restructuring* are the following: *Debt Restructuring, Equity Issues and Dividend Policy*. (Yawson, 2009b)

The proxy for *Debt Restructuring* is given by the changes in the total debt of the firm adapted to the changes of the fixed assets owned by the company. These changes can be an increase that might be useful to provide enough liquidity, or a decrease led by a renegotiation of it with the lenders (Yawson, 2009b). In the evaluation of this proxy, a minimum limit of 20% in the debt change has been set, to consider only the variation that comes from an actual restructuring strategy.

The second restructuring strategy, *Equity Issues*, is modeled as a dummy that takes the value of 1 if the company issued equity in the period or 0 otherwise. The proxy considered is the sale of common or preferred stock during the turnaround process.

Lastly, *Dividend Policy*, is considered in case of a cut or omission in the dividend payment. The proxy considered in this case is the change in the payment of the ordinary dividend (Lai & Sudarsanam, 1997).

4.4.4 Asset Restructuring

Considering the two possible scenarios for Asset restructuring, Expansion or Retrenchment, the proxy considered in this case is the change in total assets. (Yawson, 2009b). Given the nature of this proxy, it was essential to implement a minimum of 20% in the changes, in both directions (increment/decrement), to identify the change as a restructuring.

The second proxy considered instead is specific to the *Capital Expenditure Intensity,* which represents any changes in the capital expenditure adapted to the volume of the fixed assets to avoid distortions. Even for this proxy, has been considered as a restructuring any reduction in the CapEx Intensity bigger than 10%, to avoid the small changes that can't be considered a turnaround.

4.4.5 Context Variables

The effectiveness of the different restructuring strategies may depend on circumstances and some specific factors related to the firm, that are beyond the control of its managers. For this reason, is essential to take into consideration some context variables that can adjust the results obtained by the regression for the different backgrounds that each firm might have. The model constructed uses 4 different context variables: *Leverage of the firm, Size of the firm, Severity of distress, and Prior performance.*

The variable *Leverage* is the ratio of the total debt of the firm to the common equity, is important to consider this variable as the higher the leverage is and the harder will be for a firm to issue debts and get the new liquidity that might be necessary. At the same time, if funds are already available within the firm, they can be an immediate source of cash that can be of a great help in case of a liquidity crisis. (Koh et al., 2015).

The *Size of the firm* is an essential characteristic to control for, as among all the other variables this is the one that precedent literature established as the most important discriminant in the turnaround's success. The proxy is the natural logarithm of total assets (Moulton & Thomas, 1993).

Severity of distress is intuitively another crucial factor that needs to be taken into account as it can dictates both the pace of restructuring and the effectiveness of particular actions (Sudarsanam & Lai, 2001). The proxy used is the difference between the pre-distress and

distress year of the ratio EBITDA/Total assets. Lastly, the *prior performance* proxy is given by the EBITDA/Total Assets ratio to control for the profitability level before the distress.

Table 2: Formulas used for the computation of the proxies.

Proxy considered	
Asset Restructuring	
Assets Change	$(TA_{+1}-TA_{-1}/TA_{-1})$
CapEx Intensity	$((CAPEX_{+1}/LTAS_{+1})-(CAPEX_{-1}/LTAS_{-1}))/(CAPEX_{-1}/LTAS_{-1})$
Operational Restrcuturing	
Cost-cutting	$((EXP_{+1}/REV_{+1})-(EXP_{-1}/REV_{-1}))/(EXP_{-1}/REV_{-1})$
Assets efficiency	$((REV_{+1}-REV_{-1}/REV_{-1})-(FAS_{+1}-FAS_{-1}))FAS_{-1}$
Financial Restructuring	
Dividend Policy	$(DIV_{+1}-DIV_{-1})/DIV_{-1}$
Debt Restructuring	$((TD_{+1}/TA_{+1})-(TD\text{-}1/TA_{-1}))/(TD_{-1}/TA_{-1})$
Equity Issue	If a company issued equity [1]; [0] otherwise
Context Variable	
Firm Size	$\ln(TA_{-1})$
Prior Performance	$EBITDA_{-1}/TA_{-1}$
Distress Severity	$(EBITDA/TA)-(EBITDA_{-1}/TA_{-1})$
Financial Capacity	TD_{-1}/CE_{-1}

4.5 Statistical Approach

The first step in the analysis will be to understand better each independent variable, through the observation of the values obtained in each industry, specifically in will be made a comparison between recovered and not recovered firms, to better understand how the average value change across the sectors.

Once all the independent variables have been analyzed, the second step will be to go through the regression analysis.

The first regression that will be made, is a logit regression, that will help us to model the dependent variable in a more interpretable way than the probit model, giving us the logarithmic of the probability of the recovering or not recovering of the firm. After that, the second step will be to conduct a linear regression that have as dependent variable the changes in the Z-score.

In this way will be possible to understand the magnitude of the changes and will increment the interpretability of the data, giving a better idea of the results.

5. Empirical Analysis

5.1 Overview

The empirical analysis is divided into 4 different chapters:

In the first one will be described the main financial characteristics for each firm that have been chosen to evaluate the overall changes in the industry in each Pre-distress, Distress and Post-distress year.

The second chapter is about the test that assess if there is any multicollinearity problem of the variables.

In chapter 3 and 4 the thesis will cover the main part of the research, which is the regression part. Specifically, in chapter 3 will be conducted the logit regression and will be discussed the results among the different industries for each independent variable. During chapter 4, the approach will be the same, but with the analysis of the linear regression with the changes in the Z-score as dependent variable.

5.2 Changes of key financial information in Pre-distress, Distress and Post-distress

The first analysis made is to understand the sample firms' financial conditions in the 3 periods of time: *Pre-Distress*, *Distress* and *Post Distress*. To do so the performance ratios considered are the following: Return on Equity (ROE), Return on Assets (ROA), Return on Capital Employed (ROCE) and EBIT/Sales. The main goal is to understand if there is a significant difference in the ratios, between the recovered firms and the non-recovered ones.

Looking at the results presented in the *annex 1* is possible to state that, as expected, all the ratios for each industry have a lower value in the distress year compared to the period of two years before. Within these general results, only two exceptions are noticeable, *Telephone & TV* that have an *EBIT/Sales* ratio higher in the distress year and *Consumer Non-Durables* that have a *ROE* that is almost twice the pre-distress value. In both cases, however, the t-test performed doesn't show any significance in the values.

The second step is to observe the ratios two years post-distress. Specifically, it is expected a difference in the values between the firms that have a Z-score higher than 1,8, *the recovered*

firms, and the ones that didn't reach a Z-score higher than 1,8, the *non-recovered firms*. In general, the results appeared to be in line with the results of precedent literature, and therefore with what was expected. As a matter of fact, recovered firms performed substantially better than non-recovered ones with positive value in basically all the ratios that identify a return to profitability. However, must be highlighted that in *Business Equipment, Chemicals and allied products, Consumer Durables* and *Manufacturing* industries the ratio ROE is lower for the recovered firms.

5.3 Multicollinearity

A correlation matrix was created to examine the relationships among independent variables and detect potential multicollinearity, which can compromise the stability and reliability of regression coefficient estimates, thereby hindering results interpretations. Typically, correlation coefficients below -0.7 or above 0.7 are considered indicative of high correlation (Alın, 2010). However, *Table 3*, which shows the correlation matrix obtained, demonstrates that in general seems to be little correlation among the different variables with only a moderate value of correlation between *Firm Size and Prior Performance.* Given the results obtained, all the independent variables can be considered appropriate to be included in the regressions analyses conducted.

Table 3: Correlation matrix

	Changes in Z-score	Total assets change	Capital expenditure intensity	Total cost cutting	Dividend policy	Debt restructuring	Assets efficiency	Equity Issue	Firm Size	Prior Performance	Distress Severity	Leverage
Changes in Z-score	1,00											
Total assets change	(0,01)	1,00										
Capital expenditure intensity	0,03	(0,30)	1,00									
Total cost cutting	(0,05)	(0,21)	0,19	1,00								
Dividend policy	(0,02)	0,05	0,03	(0,02)	1,00							
Debt restructuring	0,01	0,12	(0,02)	(0,06)	0,04	1,00						
Assets efficiency	0,00	0,02	0,01	(0,13)	0,01	0,03	1,00					
Equity Issue	(0,02)	0,05	0,00	(0,09)	0,10	(0,03)	0,01	1,00				
Firm Size	(0,03)	0,28	0,00	0,12	(0,05)	0,09	0,01	(0,07)	1,00			
Prior Performance	0,06	0,16	0,03	0,39	(0,06)	0,09	(0,03)	(0,17)	0,46	1,00		
Distress Severity	(0,06)	0,08	(0,03)	(0,12)	0,05	0,04	0,03	(0,02)	0,15	(0,15)	1,00	
Leverage	0,01	0,01	(0,04)	0,01	(0,03)	(0,04)	(0,00)	(0,05)	0,03	0,03	0,00	1,00

To further explore the potential for multicollinearity, *Variance Inflation Factors (VIFs)* were calculated using Stata. VIF measures the extent to which multicollinearity amplifies the variance of estimated regression coefficients. A VIF value of 1 implies no correlation with

other independent variables, while values between 1 and 5 suggests a low to moderate level of correlation, potentially indicating multicollinearity. Values exceeding 5 indicate high correlation (Daoud, 2017). The results obtained, displayed in *Table 4*, show that all the values are between 1 and 1,67, confirming that the analyses are robust to the multicollinearity check.

Table 4: Variance Inflation Factors (VIF)

Variable	VIF	1/VIF
Prior Performance	1,67	0,59960
Firm Size	1,44	0,69263
Total cost cutting	1,35	0,74282
Total assets change	1,31	0,76111
Capital expenditure intensity	1,13	0,88441
Distress Severity	1,09	0,91566
Equity Issue	1,05	0,95269
Debt restructuring	1,03	0,96905
Dividend policy	1,02	0,97635
Assets efficiency	1,02	0,98124
Leverage	1,01	0,99301

5.4 Multivariate Logistic regression

This paragraph will cover the central analysis of this research. Specifically, will be performed a multivariate logistic regression for each industry with the goal of identifying the contribution of each strategy to the probability of recovering. In the last stage, will be performed a multivariate regression analysis of all the sample to have a broader view of the different strategies on all the US market. The results obtained are shown in *Annex 2*.

Industry adjustments

Initially, all the firm have been distributed among the 11 Industries coming from the Fama and French website. In this distribution the smaller sectors encountered a problem related to the lack of data. Therefore, in order to solve it and get enough observations for each industry to build a regression that can provide reliable results, the following changes have been made.

- The Oil & Gas sector merged with the Chemical sector, creating the *Energy and Chemicals.*

- Telephone & TV was unified with the Utilities industry, creating the *Services and Utilities.*
- The two industries, Consumer durables and non-durables, have been merged in one single sector named *Consumer.*

The divisions and the changes have been made with the aim of unifying the industries only if the operating business is similar. This was crucial to avoid putting together firms with completely different business structure that could influence the results.

5.4.1 Operational Restructuring

The first strategy considered is the Operational Restructuring. As explained in the precedent chapters two proxies have been used to understand its effect, *Assets efficiency* and *Cost cutting.*

Regarding *Cost cutting* the strategy adopted seems to have quite a negative result in the company performance and therefore in the probability of recovering. Although the coefficients are significant in only 3 industries *Wholesale, Energy & Chemicals* and *Business Equipment* this fact is supported by precedent literature, that explained this effect by stating that majority of cost-cutting operations from distressed firms comes from layoffs that most of the times are just desperate moves to keep the firm alive but with poor results in the medium-long term. (De Meuse et al., 1994)

The results obtained by the *Assets efficiency* are in line with the precedent strategy. As a matter of fact in the *Wholesale* and *Business Equipment* industries, where the coefficient for this strategy is significant, can be noted that also in this case the contribution to the recovery appears to be negative. Although this may be counterintuitive, an implementation of a strategy that has the goal of increasing the efficiency of the assets already in used, can be rarely the ultimate solution for recovery. In fact, this result is in line with Sudarsanam & Lai observations coming from their study, with their explanation stating that non-recovering firms tend to use this approach more intensively due to the little costs associated to it compared to external restructuring approaches. (Sudarsanam & Lai, 2001)

Therefore, looking at the overall picture, seems like the *Operational restructuring* is not a good path to follow for the majority of the cases or at least should be considered with some other external factors that can increase the likelihood of the recovery if one wants to adopt the strategy.

5.4.2 Financial Restructuring

Going through the second type of turnaround action that a firm can undertake we have analyzed the performance of financial-related restructuring actions.

Considering the *Debt Restructuring* strategy, from the results we can observe that significance of the coefficient is only for the *Energy & Chemicals* and *Other* industries. These results show that issuing or repaying a substantial amount of debt is not correlated with a positive outcome in the restructuring process. The validity of this result is backed by precedent literature, where Sudarsanam & Lai (2001) reached the same conclusion in their empirical analysis. In addition, this outcome seems to be consistent even across different countries as Kaur and Srivastava (2017) found that 91 Indian firms that undertook debt restructuring actions were not able to improve their performance up to five years after with performances that were significantly below industry peers.

Concerning *Equity Issue* is clear from the result the non-significance of the coefficient as only the industry *Consumer* gives a very weak significant value. Therefore, as found also by Yawson (2009) equity issues have no significant effect on performance changes.

Arriving to the last *Financial Restructuring* strategy considered in this thesis, *Dividend policy,* is again not significant in any of the 8 industries considered in the research. This means that there is no clear relationship between a reduction or a cut in the amount of dividend and the probability of recovery for a firm. The weak significance of this variable is also highlighted by Sudarsanam & Lai (2001) with the same final conclusion that *Dividend policy* is not an effective recovery strategy.

5.4.3 Asset Restructuring

Going through the last turnaround strategy identified and discussed in the research is possible to say that there is no univocal position of the precedent literature about the topic. According to Sudarsanam & Lai (2001), *Asset Sale* has a negative coefficient but it's also not significant, therefore this variable doesn't affect the probability of restructuring. According to Yawson (2009), instead asset divestments have a positive and significant impact on the operating performance of a firm but only from the second year after the restructuring, and the lag in the positive effect of the asset sale is the results of the difficulties associated with the reorganization of the assets. (Yawson, 2009).

The empirical findings coming from our results are not directly comparable to the ones of precedent literature, since the proxy we used identifies any change in the assets volume and therefore accounts for both, asset investments and divestments. However, results seem more in

line with what discovered by Sudarsanam & Lai (2001) as the coefficient represents negative values and is significant only for the industries *Energy & Chemicals, Wholesale* and *Consumer.*

Therefore, changing substantially the volume of the assets seems like is not an efficient way to increase the performance of a distressed firm.

Going through the second proxy considered for the *Asset Restructuring* is the *Capital expenditure intensity.* Once again, the results are in line with what obtained by Sudarsanam & Lai in their empirical analysis in the turnaround strategies. In fact, the coefficients of this proxy are not significant, therefore is not possible to say that a change in the *Capital Expenditure Intensity* have some effects on the recovery of a firm in case of financial distress.

Overall, the results obtained by the two proxies seems to be in line with what precedent literature already stated, and therefore *Asset Restructuring* as a whole strategy can't be considered an effective way to execute a turnaround process with a positive effect on financial performance.

5.4.4 Context Variables

The control variables *Firm size, Leverage, Distress Severity* and *Performance* are used to understand better the context in which the restructuring took place.

Firm size, that has been modeled as the natural logarithm of the total assets value, appears to be not significantly correlated with the probability of the restructuring in none of the 8 industries considered. Once again, these results are also like the ones coming from precedent literature, where Firm Size doesn't contribute significantly to the recovery. (Sudarsanam & Lai, 2001)

Considering now the *Leverage* level that the different firms may use, one can see that the results don't change. Therefore, also this variable is not statistically significant in any of the industry, reflecting the little level of influence that this variable has on a successful turnaround.

Distress severity obtained significant coefficients in the following industries *Business equipment, Energy & Chemicals* and *Healthcare* while *Manufacturing* is outside the significance level of 10% by only 0.3%. The results in this case vary among the different industries. As a matter of fact, *Business Equipment, Manufacturing* and *Healthcare* sectors have a positive coefficient which proves that a lower severity of distress has a positive influence on the recovering, while *Energy & Chemicals* has a contrary relationship as the interpretation of the data suggest that higher level of severity in the distress produce a better outcome of the restructuring process.

The last context variable used is *Prior Performance* that have the objective of controlling for the performance of a firm before the distress in order to understand if it has any relationship with the probability of recovery. *Prior Performance* coefficients are statistically significant in *Business Equipment, Healthcare* and *Consumer* all of them with a positive sign. This result, as expected, means that a strong prior performance contributes to an increase in the likelihood of recovery for a firm.

5.4.5 Effects of the strategies on the US market

In this last paragraph of the chapter that covers the results of the logistic regression, we will briefly discuss the results obtained by the different turnaround actions across all the sample (made of 1.796 observations) that represent a proxy for all the US market in order to have a generalized view of the strategies.

The first thing that can be noticed, is that there is an increase in the significance of the coefficients as in this last model 6 variables are significant within the threshold of 10% level, specifically: *Capital expenditure intensity, Debt Restructuring, Distress Severity, Prior Performance, Total assets change* and *Total cost cutting.*

Interpreting the results, we can now see that *Capital Expenditure Intensity,* which in the analysis of the different industries didn't reach significancy, is negatively affecting the probability of recovery. The explanation can be found in the fact that an expansion or disinvestment of the assets may result in an excessive diversification or loss of focus that can be detrimental for firm's value. (Yawson, 2009).

Debt Restructuring, instead, has the same output of what found in the different industries and therefore, this result with a higher level of significance, is a major confirm that a restructuring of the debt level is not something that can improve the performance of a distressed firm.

Going through *Distress Severity*, the regression with all the sample gives a confirmation of the principal output obtained before, which is a positive coefficient, stating that the lower the distress severity the higher the probability of recovery.

Prior Performance has the same effect that was observed in the separated sample with the only difference that the coefficient has a higher significance in the value.

Considering now the last two independent variables that reached a significant coefficient, *Total assets change* and *Total cost cutting,* one can state again that the results are in line with what have been previously discovered as both have a negative coefficient confirming that these turnaround mechanisms don't have a positive outcome in the effectiveness of a restructuring process.

Goodness of fit of the model

Evaluating now the model itself, we can see that is statistically significant at 1% level, but also that the Pseudo R2 has a quite low value which suggests that the model does not explain much of the variation in the response variable compared to a null model (a model with no predictors). It indicates that the independent variables included in the model do not adequately capture the variation in the dependent variable.

With the aim of understanding better if the model can still be valid notwithstanding the low R2 value, we decided to perform a Hosmer-Lemeshow test to assess the goodness of fit of the model.

The results obtained is a p-value of 6,21% which, considering the most used significance value of 5%, demonstrate that there is no evidence to reject the null hypothesis and therefore in this case we can conclude that the logistic regression model fits the data well.

5.5 Linear Regression

Once established the relationship between the different independent variables used and the probability of recovering, it is now necessary to understand the magnitude of the effects caused by the various strategies. Understanding the power of the different turnaround actions is crucial to see if a strategy that has a positive impact on the likelihood of recovery also has a strong effect on the performance or if the effect has only marginal power.

To do so a new dependent variable has been formulated. Following Sudarsanam & Lai (2001) approach to get the magnitude effect of the explanatory variables, the dependent variable used is the change in the Z-score value between the *Distress year* and *2 years Post Distress.* By doing so with a linear regression, whose output are shown in the *Annex 3,* would let us understand by how much the Z-score changes in the different scenarios giving us an idea of which strategy perform better or worse in absolute terms.

5.5.1 Operational Restructuring

Going through the first turnaround process discussed in the logit regression, we can see that in both the proxies considered the results of the linear regression are in accordance with what obtained before. Talking about the significance of the variables we can note that *Total cost cutting* is significant in *Business Equipment, Wholesale* and *Healthcare* industries. What we can understand from the coefficients is that this approach has a quite strong effect on the change in the Z-score as any variation by one unit in the independent variable lead to a maximum variation of -4.30 in the Z-score value observed in the *Business Equipment* industry.

The variable *Assets efficiency* is statistically significant for the following sectors *Business Equipment, Manufacturing* and *Wholesale.* Also in this case, the coefficient represents a high level of influence on the dependent variable with the highest value of -5.08 observed in the *Manufacturing* industry.

5.5.2 Financial Restructuring

Financial restructuring in the linear regression model attains to the results obtained in the logistic regression model. In fact, we can see the little significance of all the 3 proxies used across all the 8 industries considered. Specifically, *Dividend Policy* is significant only in the *Manufacturing* industry and the coefficient estimate a variation of -1.51 in the Z-score for any variation in the amount of dividend paid by the firm during distress. The dummy variable *Equity Issue* is significant but only weakly (at the 10% level) with a value of the coefficient that seems to have only a marginal effect on the dependent variable; in this case it reduces the Z-score value by just -0.48. Arriving to the last explanatory variable used as a proxy for this strategy, *Debt Restructuring,* we can see once again that it has some kind of explanatory power on the changes in the Z-score only in the *Services and Utilities* sector. In this case, the value is contrary to what obtained in the logistic regression as the coefficient estimated is now positive but again only with a marginal value of 0.45. A potential explanation of this is that although this restructuring action can lead to an increase in the Z-score, its marginal effect might not be sufficient to bring a firm outside the distress and hence to the recovery.

5.5.3 Asset Restructuring

Arriving to the last approach considered we can say from the logit regression that this strategy has in a little significance in the value and a relationship that seems to be more negative than positive in the effect on the probability of recovering.

What we can see form the results of the linear regression model is that *Capital Expenditure Intensity* is now significant in the industries *Business Equipment* and *Other* while in the previous model wasn't significant in any of the industries. Going to the interpretation of the results for the two industries that reached a significant coefficient, we noticed that a reduction in the capital expenditure seems to have a positive effect on the change in the Z-score as in both cases any variation in the independent variable lead to a quite substantial increment in the values.

For the second proxy considered, *Total assets change*, the results are again in line with what obtained in the logit regression. In fact, the coefficient is now significant only for the firm operating in the *Services and Utilities* industry with a result that represent again a negative

relationship between the change in the value of the asset and the change in the Z-score two years post distress. For the *Wholesale* and *Energy & Chemicals* sectors, the coefficient is not significant by only few decimal points, but the results are still in line with what observed in the *Services and Utilities*, therefore confirming the results.

5.5.4 Context Variables

Starting from the effect of the company's size, the coefficient is significant for *Business Equipment, Energy & Chemicals, Manufacturing* and *Wholesale.* This is pretty different from the non-significance value obtained for every industry in the logit model. The results are quite consistent among the industries, with most of them having a negative value which represent a negative influence of the firm size in the variation of the Z-score, with the only exception for *Energy Che*micals that has a coefficient of 0.13 but its significance is substantially low. These results might be complementary with what found by Yawson (2001), as he demonstrated that in the first year after distress large firms are more likely to achieve a quick turnaround, but after the first year the firm size became negatively correlated with the turnaround probability although he didn't get significance in the values.

Leverage in the new model reached significance for *Energy & Chemicals* and *Wholesale* with a positive coefficient but a very limited magnitude and therefore little influence on the Z-score. The positive influence of the leverage is also stated in previous literature as it suggests a major availability of resources for a company. (Francis & Desai, 2005)

The results of the two context variables used are different among the various industries. As a matter of fact, *Energy & Chemicals* and *Services & Utilities* have negative coefficient for both the proxies, *Prior Performance* and *Distress severity.* These results are counterintuitive as they suggest that a minor distress severity and a higher level of performance before the distress lead to a decrease in the Z-score. On the other side, *Helthcare* and *Consumer* have a positive relationship between a strong *prior performance* and the increment in the Z-score with also a high value in the coefficient. *Distress severity* instead is statistically significant for the *Wholesale* sector with an implication that a lower severity of the distress contributes with a strong magnitude in the growth of the Z-score value.

5.5.5 Constant

In the linear regression model, it is also interesting to look at the constant value obtained by the different regressions run in the different industries. The importance lies in the necessity to understand the baseline value of the change in the Z-score two years after the distress has been detected. As a matter of fact, the definition of the constant is the value of the dependent variable

at a certain point in time if all the independent variables are equal to zero.
Going to the interpretation of the results, we can see that the constant is statistically significant only in 3 out of the 8 industries considered. The value is consistent across the sectors, as it represents a positive coefficient meaning that in two-year time post distress, the Z-score tends to increase without considering the restructuring process. Specifically, *Business Equipment* reached the highest value with *3.09, Wholesale* sectors instead represents the second highest value at *2.36* while *Manufacturing* constant's coefficient is the least significant and the lowest value among the three with *1.86.* Generally speaking, at least for these 3 sectors in which the constant reached statistical significance the increase of the Z-score is pretty strong if we don't control for any factors or restructuring strategy.

5.6 Magnitude of the strategies on the US Market

As it has been made for the logit regression model, is now interesting to understand how the magnitude of the effects of the different strategies change if we consider all the sample as a whole US market proxy. Differently to the logistic regression, in the *annex 9.3.9* one can see that the number of coefficients that reached significant value is lower. In fact, only the strategy *Total cost cutting* has a significant coefficient, with all the others being the context variables and the constant.
The result obtained for *Total cost cutting* is in line with the output of the logit model as any variation in this proxy leads to a decrement of the dependent variable of -2.07.
Firms Size confirms what has been discovered in the industry separated model; being the coefficient negative, it contributes negatively to the change of the Z-score, but only with a limited intensity.
The other significant context variable is the *Prior Performance* metrics. It confirms that a strong performance prior the distress has a more positive relationship than negative. Talking about the magnitude, the effect seems to be quite important as the coefficient value is almost 3 unit of change in the Z-score for any variation of the independent variable.
As already seen in the different regressions of the various industries, the *constant* has a positive value and reached significance at the 5% level. Although in this regression with all the sample the value of the coefficient is lower than the previous separated analysis, it still has an important effect on the dependent variable as it highlights an increment of 1.19 in the Z-score value.

6. Dissertation Limitations and Further Research

In this final section, before the explanation of the key findings of the thesis, will be initially discussed the main limitations that have been encountered during the research, within the chapter 6.1, and then will go through the main suggestions that can be adopted in order to increase the importance and significance of this study for the future academic research.

6.1 Thesis's Limitations

Like much of the empirical works constructed by all the academics, it is important to understand which are the main limitations that a potential reader should account for before exploring the main conclusions, as this factor represents an important variable that could lead to different results in future research.

The first main limitation that is fundamental to consider, is that all the analyses and regressions that have been constructed and considered are modeled on the base of pure accounting data that have been gathered from a database that despite is recognized worldwide as a valid source of information, can be affected by some imprecisions and might not be totally correct on the data extracted which can potentially change the results obtained. In connection with the limitations of using a universal database, is crucial to consider that due to the lack of figures for many of the firms initially considered, we had to remove them from the research, potentially affecting the final results. Specifically, as all the firms that had value of the assets under a specific threshold have been deleted, the results can be biased as they may not fully represent a heterogeneous sample that can capture all the differences among firms with important difference in the size.
Additionally, as stated before, since have been used only pure accounting data, these don't account for firm's specific conditions that aren't reflected in the financials, but that can affect substantially the probability of recovery and its intensity.

Another important limitation, already previously mentioned at the beginning of *chapter 4,* is that one strategy, *Managerial Restructuring,* was not considered due to the unavailability of the data for all the firms. As previous literature implemented this strategy in the research, is important to consider it as a limitation because can capture an important part of the global

explanation for the recovering or not recovering of the firms as it accounts for the human factor that is essential to understand and evaluate such a delicate topic.

The last limitation that has been identified, is that the sample considered is strongly biased by its geographical position. As a matter of fact, only US listed companies have been considered, therefore this research doesn't take into considerations many other country-related factors that can lead to very different outcomes of the restructuring processes.

6.2 Recommendations for Further Research

Considering the issues highlighted above and in order to get more accurate results, we would have some recommendations to make for further research in this field.

The first suggestion would be to assess the last problem discussed in the limitations part related to the geographical-biased sample. Therefore, considering a wider sample that spread across various countries with very different background can improve the global comprehension of the turnaround mechanism, fundamental for any firm worldwide.

A second recommendation, which is again crucial to have a more open view of how the restructuring strategies affect different type of firms, is to consider the privately held companies, which represent the main stake of firms in the world.
In order to do so, it is crucial to adapt the main indicator that has been used throughout the thesis, the Z-score. In fact, Altman et al. (2014) demonstrated the reliability of the Z'- score and Z''- score models, previously developed and discussed in 1968 by Altman itself, which are the adaptations of the normal model for the private firms. The final discriminant function that should be used is the one that follows:

$$Z\ score = 0{,}717 * X1 + 0{,}847 * X2 + 3{,}107 * X3 + 0{,}420 * X4 + 0{,}998 * X5$$

Where,

$$X1 = \frac{Working\ capital}{Total\ assets}$$

$$X2 = \frac{Retained\ Earnings}{Total\ assets}$$

$$X3 = \frac{Earnings\ before\ interest\ and\ taxes}{Total\ assets}$$

$$X4 = \frac{Market\ value\ of\ equity}{Book\ value\ of\ total\ liabilities}$$

$$X5 = \frac{Sales}{Total\ assets}$$

Z = Overall Index

One last recommendation that would be interesting to implement for further research, is an analysis of the results at different points in time rather than considering just one and only period two years after the distress. Considering different periods of observation would help to understand better and in a more comprehensive way how the performance changes overtime, as its likely that the different restructuring processes can have a diverse time to become effective and therefore this research would indicate that a strategy is not effective in two-years' time while it could be in three or four years. This approach would be able to correct the results giving a better comprehension of how much time is necessary for a specific turnaround process to have the positive effect that is expected from the management.

7. Key findings and conclusion

Before discussing the main findings and conclusion of the thesis, we will briefly recap the different chapter that compose the research.

Chapter 1 - We discussed the research objectives and the problems that induce the researcher into the discover of the potential relationship and outcomes of the turnaround processes that are widely adopted by ailing enterprises.

Chapter 2 - Covered the literature review with and extensive definitions of the restructuring strategies that have been considered in this empirical work, in order to have a reference point of what precedent studies have found to have a broad understanding of what are the expected outcomes.

Chapter 3 – It contains the overview of which data have been used, with an explanation of how the data have been gathered and which have been the problems associated with it.

Chapter 4 – We defined the methodology and the approach that was used throughout the research. We also explained the reasons why the multivariate logistic regression and the linear logistic regression were the most appropriate statistical tool to be used together in order to get the results that can be easily interpretated.

Chapter 5 – It is where the empirical work take place. Specifically, have been initially considered the results coming from the logit regression with the outcomes of the turnaround strategies to understand if they have a positive or negative influence on the recovering probability. The second step was to perform the same analysis with the results coming from the linear regressions in order to understand the magnitude of the restructuring process.

Chapter 6 – We discussed the limitations highlighted during the thesis and the potential suggestions for future research on the topic.

Coming to the main findings, the first observable outcome is that in every industry there is a significant decline in the performance of the firms if we compare the main key financials two years pre distress and in the distress year. Considering, instead, the same performance metrics two years after the distress, it is possible to notice how the recovering firms had a substantial increment of the financial performance compared to the non-recovering firms whose performances are very similar or even worse to the one observed in the distress year. Therefore,

this is a confirmation that using Z-score to assess default probability is a good metrics that can identify the real financial conditions of the companies.

After this first analysis, the regressions output made possible to underline the effects of the three different strategies studied.
Operational Restructuring, for which the two proxies considered are *Total cost cutting* and *Assets efficiency,* demonstrated to have a negative influence on the restructuring process and with a strong magnitude effect coming from the results of the linear regression.

The second strategy analyzed, *Financial Restructuring*, demonstrated to have very little significance in the output values in each of the 3 proxies and in both regressions, logistic and linear. However, what the few industries with significant coefficient demonstrated is that again this strategy has a negative effect on the probability of recovering but with a lower magnitude than Operational Restructuring. These results are also in line with what discovered in the precedent literature, that already assessed the little effect and significance of this variable on the probability of recovering.

The third and last strategies studied, *Asset Restructuring,* has different results in the two proxies used, *Capital Expenditure Intensity* and *Total Assets Change.* The output of the two regressions, show that an important change in the assets' value of a firm is not positively associated with an increase in the probability of recovering. On the contrary, a reduction in the intensity of *Capital Expenditure,* shows an increment of the Z-score value two years after distress, therefore demonstrating that reducing the amount of the Capex for a distressed firm can increase the financial performance.

In conclusion, a general view of these 3 strategies studied can suggest that only one of them is positively associated with an increase in the firm's performance and by consequence an increase in the probability of recovering. This result is largely in line with what has been previously discovered, and therefore a confirmation that using only one strategy at the time is not an effective choice from the management aiming to improve the overall condition of a distressed firm.

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9. Annexes

9.1 – Evolution of key financials in the Pre-Distress, Distress and Post Distress periods

Annex 1 reports the key financial metrics of the sample firms divided per industry in the Pre-distress, Distress and Post-distress moments. The tables are divided into two sections that represents recovered and not recovered firms. ***, ** and * denote statistical significance at 1%, 5% and 10% respectively.

9.1.1 - Business Equipment

	Recovered			*Not recovered*		
	2 yrs before Distress	*Distress year*	T test	*2 yrs before Distress*	*Distress year*	T test
EBIT / Sales	-7,53%	-8,52%	0,101	-13,17%	-19,33%	0,9269
ROE	3,03%	-27,09%	3,3082***	-3,30%	-35,27%	1,7816**
ROA	0,95%	-15,89%	8,4788***	-1,46%	-22,81%	6,7845***
EBIT/(TA-CL)	3,99%	-6,06%	5,5978***	1,91%	-11,49%	7,3038***

	Recovered			*Not recovered*		
	Distress year	*2 yrs post Distress*	T test	*Distress year*	*2 yrs post Distress*	T test
EBIT / Sales	-8,52%	5,80%	-5,0756***	-19,33%	-10,82%	-2,1798**
ROE	-27,09%	9,29%	-3,8678***	-35,27%	202,21%	-1,1536
ROA	-15,89%	2,68%	-9,6197***	-22,81%	-13,12%	-2,9538***
EBIT/(TA-CL)	-6,06%	6,52%	-7,463***	-11,49%	-11,05%	-0,2004

9.1.2 – Chemicals and allied products

	Recovered			*Not recovered*		
	2 yrs before Distress	*Distress year*	T test	*2 yrs before Distress*	*Distress year*	T test
EBIT / Sales	10,96%	-3,89%	1,4799*	4,30%	-1,83%	0,7596
ROE	17,85%	9,77%	0,662	14,81%	-8,02%	1,8677**
ROA	3,98%	-1,95%	3,1407***	6,44%	-7,25%	1,8042**
EBIT/(TA-CL)	11,76%	-0,07%	2,485***	7,59%	-1,57%	1,6689*

	Recovered			*Not recovered*		
	Distress year	*2 yrs post Distress*	T test	*Distress year*	*2 yrs post Distress*	T test
EBIT / Sales	-3,89%	9,67%	-1,3397*	-1,83%	-14,06%	1,1091
ROE	9,77%	30,45%	-1,5108*	-8,02%	42,42%	-0,7179
ROA	-1,95%	9,01%	-2,804***	-7,25%	-14,51%	0,6994
EBIT/(TA-CL)	-0,07%	9,30%	-1,9983**	-1,57%	-8,25%	0,8306

9.1.2 Consumer durables

	Recovered			*Not recovered*		
	2 yrs before Distress	*Distress year*	T test	*2 yrs before Distress*	*Distress year*	T test
EBIT / Sales	5,34%	-5,16%	2,5081**	2,95%	-3,35%	0,8539
ROE	3,53%	-12,69%	0,596	13,66%	4,12%	0,3434
ROA	1,38%	-10,17%	3,4068***	1,83%	-12,20%	2,8436***
EBIT/(TA-CL)	5,18%	-4,33%	2,8162***	7,66%	-4,32%	2,2286**

	Recovered			*Not recovered*		
	Distress year	*2 yrs post Distress*	T test	*Distress year*	*2 yrs post Distress*	T test
EBIT / Sales	-5,16%	5,47%	-2,71***	-3,35%	1,22%	-0,7162
ROE	-12,69%	21,33%	-1,1523	4,12%	85,36%	-1,0621
ROA	-10,17%	5,93%	-4,2231***	-12,20%	-10,10%	-0,363
EBIT/(TA-CL)	-4,33%	7,96%	-3,1244***	-4,32%	-0,65%	-0,6311

9.1.3 – Consumer non-durables

	Recovered			Not recovered		
	2 yrs before Distress	Distress year	T test	2 yrs before Distress	Distress year	T test
EBIT / Sales	9,21%	5,01%	1,7279**	4,17%	2,04%	0,2632
ROE	12,70%	-26,23%	3,3298***	4,75%	9,63%	-0,2643
ROA	4,66%	-6,70%	3,6453***	4,08%	-4,02%	3,11***
EBIT/(TA-CL)	10,20%	-0,94%	2,7118***	13,13%	0,28%	2,0954**

	Recovered			Not recovered		
	Distress year	2 yrs post Distress	T test	Distress year	2 yrs post Distress	T test
EBIT / Sales	5,01%	9,71%	-2,123**	2,04%	3,97%	-0,3375
ROE	-26,23%	7,59%	-2,9543***	9,63%	-80,77%	1,6459*
ROA	-6,70%	3,12%	-3,7779***	-4,02%	-9,16%	0,9493
EBIT/(TA-CL)	-0,94%	8,10%	-2,3789**	0,28%	-8,13%	1,1424

9.1.4 – Healthcare

	Recovered			Not recovered		
	2 yrs before Distress	Distress year	T test	2 yrs before Distress	Distress year	T test
EBIT / Sales	-371,11%	-233,13%	-0,723	-416,49%	-430,80%	0,1201
ROE	-19,71%	-33,13%	1,6409*	-15,42%	-28,57%	0,3336
ROA	-11,85%	-23,44%	3,3139***	-12,93%	-28,87%	5,2308***
EBIT/(TA-CL)	-12,23%	-36,05%	2,9479***	-12,23%	-36,05%	2,9479***

	Recovered			Not recovered		
	Distress year	2 yrs post Distress	T test	Distress year	2 yrs post Distress	T test
EBIT / Sales	-233,13%	-237,83%	0,046	-430,80%	-426,48%	-0,0334
ROE	-33,13%	-13,04%	-2,4611***	-28,57%	-65,52%	0,7076
ROA	-23,44%	-10,39%	-3,5787***	-28,87%	-27,45%	-0,4047
EBIT/(TA-CL)	-36,05%	-28,87%	-0,8524	-36,05%	-28,87%	-0,8524

9.1.5 – Manufacturing

	Recovered			Not recovered		
	2 yrs before Distress	Distress year	T test	2 yrs before Distress	Distress year	T test
EBIT / Sales	6,75%	-1,59%	4,0955***	7,80%	-2,18%	3,8179***
ROE	6,79%	-59,93%	2,8626***	65,09%	-12,61%	1,7728**
ROA	2,24%	-11,77%	6,8221***	3,42%	-10,02%	5,6085***
EBIT/(TA-CL)	8,60%	-2,15%	5,3652***	10,11%	-2,61%	6,289***

	Recovered			Not recovered		
	Distress year	2 yrs post Distress	T test	Distress year	2 yrs post Distress	T test
EBIT / Sales	-1,59%	5,96%	-3,3358***	-2,18%	-4,00%	0,4718
ROE	-59,93%	12,35%	-3,0713***	-12,61%	34,70%	-1,2689
ROA	-11,77%	3,14%	-6,3922***	-10,02%	-9,95%	-0,0155
EBIT/(TA-CL)	-2,15%	9,61%	-5,5888***	-2,61%	-8,14%	0,9439

9.1.6 - Oil & Gas

	Recovered			Not recovered		
	2 yrs before Distress	Distress year	T test	2 yrs before Distress	Distress year	T test
EBIT / Sales	-32,32%	-33,34%	0,019	18,54%	-11,64%	3,3975***
ROE	13,38%	-26,50%	4,6645***	8,62%	-18,01%	2,7797***
ROA	5,90%	-10,74%	5,1123***	4,38%	-6,41%	4,1337***
EBIT/(TA-CL)	10,28%	-13,04%	5,7036***	9,56%	-6,03%	3,6474***

	Recovered			Not recovered		
	Distress year	2 yrs post Distress	T test	Distress year	2 yrs post Distress	T test
EBIT / Sales	-33,34%	12,70%	-3,5374***	-11,64%	-19,49%	0,637
ROE	-26,50%	21,16%	-5,2688***	-18,01%	-32,74%	0,6885
ROA	-10,74%	8,15%	-6,3798***	-6,41%	-7,49%	0,3121
EBIT/(TA-CL)	-13,04%	13,59%	-6,3602***	-6,03%	-6,75%	0,1253

9.1.7 - Other

	Recovered			Not recovered		
	2 yrs before Distress	Distress year	T test	2 yrs before Distress	Distress year	T test
EBIT / Sales	-39,01%	-96,10%	0,572	10,61%	-2,60%	2,8666***
ROE	2,25%	-25,32%	2,6771***	2,66%	-7,33%	1,537*
ROA	4,55%	-9,18%	4,0707***	4,14%	-5,46%	6,6851***
EBIT/(TA-CL)	10,64%	-2,75%	3,9752***	9,26%	0,85%	7,6082***

	Recovered			Not recovered		
	Distress year	2 yrs post Distress	T test	Distress year	2 yrs post Distress	T test
EBIT / Sales	-96,10%	-45,98%	-0,4704	-2,60%	-6,35%	0,844
ROE	-25,32%	9,67%	-3,7595***	-7,33%	-19,24%	1,0951
ROA	-9,18%	3,74%	-3,8421***	-5,46%	-6,18%	0,3559
EBIT/(TA-CL)	-2,75%	8,79%	-4,0439***	0,85%	-2,34%	1,5574*

9.1.8 – Telephone & TV

	Recovered			Not recovered		
	2 yrs before Distress	Distress year	T test	2 yrs before Distress	Distress year	T test
EBIT / Sales	12,32%	8,38%	0,774	-85,53%	-37,49%	-0,5056
ROE	9,92%	-18,09%	2,9926***	8,37%	-30,76%	1,8965**
ROA	4,19%	-6,37%	2,9193***	1,68%	-13,06%	1,7314**
EBIT/(TA-CL)	6,44%	4,53%	0,453	5,22%	1,01%	1,3836*

	Recovered			Not recovered		
	Distress year	2 yrs post Distress	T test	Distress year	2 yrs post Distress	T test
EBIT / Sales	8,38%	12,48%	-0,803	-37,49%	4,73%	-1,1
ROE	-18,09%	9,03%	-1,9581**	-30,76%	-115,44%	0,795
ROA	-6,37%	10,02%	-2,2644**	-13,06%	-2,82%	-1,1654
EBIT/(TA-CL)	4,53%	8,62%	-0,986	1,01%	1,01%	0,0005

9.1.9 – Utilities

	Recovered			Not recovered		
	2 yrs before Distress	Distress year	T test	2 yrs before Distress	Distress year	T test
EBIT / Sales	15,24%	15,68%	-0,087	13,71%	9,40%	0,7219
ROE	12,10%	16,51%	-0,679	13,82%	4,07%	1,2117
ROA	4,24%	3,03%	1,4146*	3,75%	2,18%	0,9095
EBIT/(TA-CL)	10,98%	9,38%	0,738	10,43%	6,47%	1,5818*

	Recovered			Not recovered		
	Distress year	2 yrs post Distress	T test	Distress year	2 yrs post Distress	T test
EBIT / Sales	15,68%	13,61%	0,488	9,40%	13,66%	-0,7052
ROE	16,51%	18,91%	-0,318	4,07%	-5,58%	0,5445
ROA	3,03%	4,54%	-1,5892*	2,18%	0,56%	0,6175
EBIT/(TA-CL)	9,38%	9,00%	0,175	6,47%	6,68%	-0,0835

9.1.10 – Wholesale & Retail

	Recovered			Not recovered		
	2 yrs before Distress	Distress year	T test	2 yrs before Distress	Distress year	T test
EBIT / Sales	6,24%	-2,06%	4,8078***	5,69%	0,01%	3,4798***
ROE	8,44%	-37,84%	3,0497***	2,53%	-34,79%	3,408***
ROA	4,77%	-10,83%	6,5143***	2,65%	-9,06%	4,1306***
EBIT/(TA-CL)	12,06%	-7,17%	5,9325***	10,89%	-0,07%	3,3343***

	Recovered			Not recovered		
	Distress year	2 yrs post Distress	T test	Distress year	2 yrs post Distress	T test
EBIT / Sales	-2,06%	5,52%	-4,5211***	0,01%	1,65%	-0,5919
ROE	-37,84%	1,88%	-2,0352**	-34,79%	-2,37%	-0,7896
ROA	-10,83%	2,75%	-5,2477***	-9,06%	-4,14%	-1,2219
EBIT/(TA-CL)	-7,17%	9,30%	-5,1043***	-0,07%	-0,10%	0,0063

9.2 – Results of the multivariate logistic regressions

Annex 2 shows the results of the multivariate logistic regressions conducted for the different industries. In the table are shown the coefficients obtained for the different restructuring strategies and the context variables. ***, ** and * denote statistical significance at 1%, 5% and 10% respectively.

9.2.1 – Business Equipment

N of Obs	**464**
LR Chi2 (11)	**31,22**
P > chi2	**0,001**
Pseudo R2	**0,0487**

Variable	*Coefficient*	*Std. Error*	*P-value*
Constant	-0,125	0,525	0,812
Assets Efficiency	-0,661	0,326	0,043**
Cost cutting	-1,725	0,706	0,014**
Debt Restructuring	0,039	0,257	0,879
Equity Issue	-0,254	0,315	0,421
Dividend policy	0,645	0,560	0,249
CapEx Intensity	0,051	0,355	0,886
Asset Change	0,109	0,161	0,497
Firm Size	0,414	0,669	0,547
Leverage	-0,067	0,115	0,56
Distress Severity	1,897	0,907	0,037**
Prior Performance	2,623	0,990	0,008***

9.2.2 – Energy & Chemicals

N of Obs	**205**
LR Chi2 (11)	**23,44**
P > chi2	**0,0153**
Pseudo R2	**0,0834**

Variable	*Coefficient*	*Std. Error*	*P-value*
Constant	-0,809	0,840	0,336
Assets Efficiency	-0,600	0,572	0,294
Cost cutting	-1,983	1,020	0,052*
Debt Restructuring	-0,585	0,251	0,020**
Equity Issue	-0,242	0,355	0,494
Dividend policy	0,866	0,761	0,255
CapEx Intensity	-0,276	0,679	0,685
Asset Change	-0,631	0,300	0,035**
Firm Size	0,855	0,916	0,351
Leverage	0,010	0,077	0,894
Distress Severity	-2,905	1,255	0,021**
Prior Performance	0,340	1,641	0,836

9.2.3 – Services & Utilities

N of Obs	**109**
LR Chi2 (11)	**6,45**
P > chi2	**0,8419**
Pseudo R2	**0,0462**

Variable	*Coefficient*	*Std. Error*	*P-value*
Constant	-0,966	1,190	0,417
Assets Efficiency	-1,005	0,837	0,230
Cost cutting	-1,806	1,924	0,348
Debt Restructuring	0,074	0,221	0,738
Equity Issue	0,128	0,613	0,835
Dividend policy	-0,810	0,705	0,250
CapEx Intensity	-0,968	1,127	0,391
Asset Change	-0,034	0,112	0,761
Firm Size	-0,006	0,127	0,960
Leverage	-0,104	0,209	0,620
Distress Severity	-0,160	3,220	0,960
Prior Performance	0,202	2,924	0,945

9.2.4 – Other

N of Obs	**297**
LR Chi2 (11)	**14,8**
P > chi2	**0,192**
Pseudo R2	**0,0367**

Variable	*Coefficient*	*Std. Error*	*P-value*
Constant	0,054	0,634	0,932
Assets Efficiency	0,007	0,163	0,672
Cost cutting	-0,646	0,733	0,378
Debt Restructuring	-0,489	0,208	0,019**
Equity Issue	-0,065	0,291	0,824
Dividend policy	0,594	0,529	0,261
CapEx Intensity	-0,256	0,507	0,615
Asset Change	0,048	0,191	0,800
Firm Size	-0,034	0,082	0,677
Leverage	-0,012	0,012	0,343
Distress Severity	-1,238	1,185	0,296
Prior Performance	-1,279	1,699	0,452

9.2.5 – Manufacturing

N of Obs	**184**
LR Chi2 (11)	**12,11**
P > chi2	**0,3557**
Pseudo R2	**0,0477**

Variable	*Coefficient*	*Std. Error*	*P-value*
Constant	1,302	0,785	0,097*
Assets Efficiency	-0,362	0,309	0,242
Cost cutting	-1,696	1,174	0,149
Debt Restructuring	-0,279	0,658	0,671
Equity Issue	-0,313	0,324	0,923
Dividend policy	0,251	0,592	0,672
CapEx Intensity	0,213	0,637	0,738
Asset Change	-0,362	0,309	0,242
Firm Size	-0,138	0,101	0,171
Leverage	0,109	0,123	0,376
Distress Severity	3,213	1,972	0,103
Prior Performance	1,997	2,392	0,404

9.2.6 – Wholesale

N of Obs	**103**
LR Chi2 (11)	**23,61**
P > chi2	**0,0145**
Pseudo R2	**0,1659**

Variable	*Coefficient*	*Std. Error*	*P-value*
Constant	-0,592	1,275	0,643
Assets Efficiency	-2,852	1,609	0,076*
Cost cutting	-4,096	2,421	0,091*
Debt Restructuring	-0,298	0,250	0,234
Equity Issue	-0,842	0,515	0,102
Dividend policy	-0,672	0,919	0,465
CapEx Intensity	-0,143	0,881	0,871
Asset Change	-0,939	0,493	0,057*
Firm Size	0,206	0,167	0,219
Leverage	0,071	0,138	0,607
Distress Severity	-1,195	2,510	0,634
Prior Performance	-0,838	2,801	0,765

9.2.7 – Consumer

N of Obs	**128**
LR Chi2 (11)	**15,97**
P > chi2	**0,1423**
Pseudo R2	**0,0906**

Variable	*Coefficient*	*Std. Error*	*P-value*
Constant	-1,009	1,027	0,326
Assets Efficiency	-0,663	0,950	0,486
Cost cutting	-1,911	1,749	0,275
Debt Restructuring	0,208	0,228	0,362
Equity Issue	0,707	0,428	0,098*
Dividend policy	-0,590	0,751	0,432
CapEx Intensity	-0,325	0,876	0,711
Asset Change	-0,785	0,429	0,067*
Firm Size	-0,004	0,126	0,973
Leverage	0,061	0,070	0,377
Distress Severity	3,246	2,998	0,279
Prior Performance	5,242	2,631	0,046**

9.2.8 – Healthcare

N of Obs	**299**
LR Chi2 (11)	**19,67**
P > chi2	**0,0501**
Pseudo R2	**0,0526**

Variable	*Coefficient*	*Std. Error*	*P-value*
Constant	0,128	0,880	0,884
Assets Efficiency	-0,018	0,059	0,765
Cost cutting	-0,678	0,530	0,201
Debt Restructuring	-0,171	0,338	0,613
Equity Issue	0,188	0,669	0,779
Dividend policy	0,108	0,590	0,855
CapEx Intensity	-0,322	0,415	0,438
Asset Change	-0,370	0,239	0,122
Firm Size	-0,113	0,106	0,285
Leverage	-0,214	0,198	0,281
Distress Severity	1,399	0,761	0,066*
Prior Performance	2,767	0,808	0,001***

9.2.9 – Logit regression with all the sample

N of Obs	**1796**
LR Chi2 (11)	**60,17**
P > chi2	**0,0000**
Pseudo R2	**0,0245**

Variable	*Coefficient*	*Std. Error*	*P-value*
Constant	-0,306	0,247	0,215
Assets Efficiency	0,004	0,006	0,499
Cost cutting	-0,807	0,281	0,004***
Debt Restructuring	-0,257	0,078	0,001***
Equity Issue	-0,121	0,123	0,326
Dividend policy	0,036	0,207	0,861
CapEx Intensity	-0,389	0,180	0,031**
Asset Change	-0,203	0,072	0,005***
Firm Size	0,000	0,031	0,997
Leverage	0,001	0,005	0,912
Distress Severity	0,617	0,369	0,095*
Prior Performance	2,179	0,394	0,000***

9.3 – Results of the linear regressions

Annex 3 shows the results of the linear regressions conducted for the different industries. In the table are shown the coefficients obtained for the different restructuring strategies and the context variables. ***,** and * denote statistical significance at 1%, 5% and 10% respectively.

9.3.1 - Business Equipment

N of Obs	**464**
F(11, 452)	**2,93**
Prob > F	**0,0009**
R-squared	**0,0665**

Variable	*Coefficient*	*Std. Error*	*P-value*
Constant	3,099	0,912	0,001***
Assets Efficiency	-1,300	0,454	0,004***
Cost cutting	-4,300	1,207	0,000***
Debt Restructuring	-0,495	0,443	0,264
Equity Issue	-0,235	0,056	0,672
Dividend policy	1,345	0,930	0,149
CapEx Intensity	1,611	0,624	0,01**
Asset Change	0,124	0,286	0,664
Firm Size	-0,306	0,120	0,011**
Leverage	-0,005	0,200	0,981
Distress Severity	1,155	1,107	0,297
Prior Performance	2,029	1,599	0,205

9.3.2 – Energy & Chemicals

N of Obs	**205**
F(11, 193)	**6,28**
Prob > F	**0,0000**
R-squared	**26,34**

Variable	*Coefficient*	*Std. Error*	*P-value*
Constant	-0,739	0,711	0,300
Assets Efficiency	0,019	0,271	0,944
Cost cutting	-0,969	0,825	0,242
Debt Restructuring	0,048	0,139	0,732
Equity Issue	-0,142	0,307	0,643
Dividend policy	-0,208	0,616	0,736
CapEx Intensity	0,099	0,568	0,862
Asset Change	-0,362	0,224	0,107
Firm Size	0,130	0,078	0,097*
Leverage	0,104	0,057	0,072*
Distress Severity	-6,554	0,936	0,000***
Prior Performance	-2,934	1,281	0,023**

9.3.3 – Services & Utilities

N of Obs	**109**
F(11, 97)	**8,6**
Prob > F	**0,0000**
R-squared	**0,4938**

Variable	*Coefficient*	*Std. Error*	*P-value*
Constant	0,458	0,610	0,455
Assets Efficiency	-0,351	0,329	0,289
Cost cutting	-0,200	0,985	0,840
Debt Restructuring	0,454	0,110	0,000***
Equity Issue	-0,053	0,305	0,861
Dividend policy	-0,148	0,377	0,969
CapEx Intensity	-0,074	0,593	0,901
Asset Change	-0,112	0,057	0,054*
Firm Size	-0,046	0,065	0,481
Leverage	0,066	0,102	0,521
Distress Severity	-13,882	1,714	0,000***
Prior Performance	2,836	1,532	0,067*

9.3.4 – Other

N of Obs	**297**
F(11, 285)	**0,59**
Prob > F	**0,8363**
R-squared	**0,0223**

Variable	*Coefficient*	*Std. Error*	*P-value*
Constant	1,106	1,933	0,568
Assets Efficiency	-0,002	0,009	0,794
Cost cutting	-1,581	2,167	0,466
Debt Restructuring	0,265	0,473	0,576
Equity Issue	-0,096	0,883	0,914
Dividend policy	-0,486	1,550	0,754
CapEx Intensity	2,751	1,539	0,075*
Asset Change	0,459	0,583	0,432
Firm Size	-0,058	0,247	0,815
Leverage	-0,003	0,024	0,909
Distress Severity	-4,540	3,148	0,15
Prior Performance	-4,713	5,106	0,357

9.3.5 – Manufacturing

N of Obs	**184**
F(11, 172)	**2,52**
Prob > F	**0,0058**
R-squared	**0,1386**

Variable	*Coefficient*	*Std. Error*	*P-value*
Constant	1,869	0,838	0,027**
Assets Efficiency	-5,085	1,590	0,002***
Cost cutting	-1,400	0,138	0,22
Debt Restructuring	-0,111	0,720	0,877
Equity Issue	0,412	0,351	0,241
Dividend policy	-1,511	0,646	0,021
CapEx Intensity	-0,003	0,690	0,997
Asset Change	-0,019	0,318	0,952
Firm Size	-0,205	0,108	0,059*
Leverage	0,014	0,074	0,853
Distress Severity	1,772	2,061	0,391
Prior Performance	-1,073	2,484	0,666

9.3.6 – Wholesale

N of Obs	**103**
F(11, 91)	**4,48**
Prob > F	**0,0000**
R-squared	**0,3511**

Variable	*Coefficient*	*Std. Error*	*P-value*
Constant	2,370	0,773	0,003***
Assets Efficiency	-3,776	0,978	0***
Cost cutting	-3,657	0,522	0,477
Debt Restructuring	-0,008	0,119	0,947
Equity Issue	-0,490	0,293	0,098*
Dividend policy	0,463	0,482	0,339
CapEx Intensity	0,372	0,522	0,477
Asset Change	-0,432	0,268	0,111
Firm Size	-0,181	0,098	0,068*
Leverage	0,009	0,005	0,053*
Distress Severity	4,171	1,500	0,007***
Prior Performance	2,071	1,529	0,179

9.3.7 – Consumer

N of Obs	**128**
F(11, 116)	**2,18**
Prob > F	**0,0197**
R-squared	**0,1716**

Variable	*Coefficient*	*Std. Error*	*P-value*
Constant	-0,096	1,051	0,927
Assets Efficiency	-1,055	0,798	0,188
Cost cutting	-2,453	1,499	0,105
Debt Restructuring	0,175	0,223	0,435
Equity Issue	0,030	0,437	0,945
Dividend policy	-1,001	0,744	0,181
CapEx Intensity	0,471	0,888	0,597
Asset Change	-0,109	0,191	0,569
Firm Size	-0,058	0,129	0,655
Leverage	-0,006	0,045	0,901
Distress Severity	4,335	2,922	0,141
Prior Performance	7,985	2,272	0,001***

9.3.8 – Healthcare

N of Obs	**299**
F(11, 287)	**0,76**
Prob > F	**0,6796**
R-squared	**0,0283**

Variable	*Coefficient*	*Std. Error*	*P-value*
Constant	2,043	2,836	0,472
Assets Efficiency	-0,094	0,174	0,589
Cost cutting	-2,908	1,592	0,069*
Debt Restructuring	-0,054	1,006	0,958
Equity Issue	0,518	2,177	0,812
Dividend policy	-1,362	1,823	0,456
CapEx Intensity	-0,144	1,292	0,912
Asset Change	-0,490	0,620	0,430
Firm Size	-0,419	0,328	0,203
Leverage	-0,080	0,143	0,578
Distress Severity	2,069	2,062	0,317
Prior Performance	5,164	2,171	0,018**

9.3.9 – Linear regression with all the sample

N of Obs	**1796**
F(11, 1784)	**2,38**
Prob > F	**0,0063**
R-squared	**0,0145**

Variable	*Coefficient*	*Std. Error*	*P-value*
Constant	1,191	0,532	0,025**
Assets Efficiency	-0,002	0,006	0,805
Cost cutting	-2,080	0,576	0,000***
Debt Restructuring	-0,003	0,133	0,983
Equity Issue	-0,066	0,267	0,806
Dividend policy	-0,389	0,442	0,380
CapEx Intensity	0,582	0,381	0,126
Asset Change	-0,100	0,126	0,429
Firm Size	-0,157	0,067	0,02**
Leverage	0,003	0,011	0,783
Distress Severity	-0,213	0,712	0,765
Prior Performance	2,953	0,754	0,000***