Acquisitions of distressed firms: 'A gem in the rough or a pig in a poke'

- An empirical analysis of the European market for mergers and acquisitions

Master Thesis, Copenhagen Business School

- MSc. Finance & Investments

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May 15th, 2018

Number of characters (incl. spacing): 254.121

Number of pages (excl. appendix): 120

ABSTRACT

This paper examines acquisitions of distressed targets from the acquirers' point of view on the European market. Even though fire-sales have caught the attention of researches through the last decade the application of the theoretical framework to acquisitions have first gained ground in the recent years.

The paper provides evidence for distressed targets are sold at a discount compared to non-distressed targets. The discount is even deeper when the targets industry also faces distress. There were no results indicating that fire-sale, which was a prediction of Shleifer & Vishny (1992), caused the distressed target to be sold to an acquirer outside the industry. However, it was demonstrated that acquirers outside the industry exploited the targets weakened bargaining power and was able to gain higher abnormal returns. The paper was not able to show that the level of implicit competition was a fire-sales channel when the industry also faced distress. The paper also investigated whether the asset specificity was deterministic for a fire-sale to occur as proposed by several theories. The paper was not able to demonstrate asset specificity as a fire-sale channel.

It was also investigated whether the access to the equity market and the general conditions on both the debt- and equity markets was a channel of fire-sales. The paper was not able to show any robust results to support this. The paper also aimed to investigate how general economic- and financial crisis affected the acquisition outcome of distressed target acquisitions. Empirical evidence of distressed targets sold during a crisis at a larger discount was also documented.

At last, the paper examined if turnaround skills obtained through experience and sufficient slack resources had an influence on the acquisitions outcome. There was nothing in the results indicating this.

Even though the paper was able to show that fire-sales exists on the European market. All the findings the study could show was on short-term. However, on the long-term the study was not able to find any significant abnormal acquirer gain.

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1 Introduction

Initially in section 1.1, the background of the paper will be explained. Afterwards in section 1.2 a thorough literature review is carried out to give an overview of the existing literature within the field and shed light on potential research areas where the literature is not exhaustive. Based on the literature review a problem statement in section 1.3 is worked out. In section 1.4 the delimitations of the paper are described to give a clear understanding of the papers frames. Furthermore, section 1.5 contains the theory of science, which describes the foundations of the paper and in section 1.6 the research approach will be explained. Section 1.7 will contain thoughts about the reliability and validity of the study. Finally, in section 1.8 there will be an overview of the structure of the paper.

1.1 Background

Today's business is about being competitive and capable to gain market shares from the rivals. To achieve this growth there are several strategies the companies can apply. Mergers and acquisition represents an opportunity for a firm to grow at a higher pace, also called inorganic growth, than if they decided to grow internally. The rationale of such a strategy is to achieve some advantageous over its competitors. Such an advantage is expensive because the acquirer has to propose a tender offer (Stout, 1990). The competition for the targets assets drives up the premium, this continue until the realized price is equal or beyond its fair price. This removes the gain for the acquire (Bruton et al., 1994). However, this is not always the case. Pulvino (1998) reported that financial constraint airlines sold airplanes at a discount of 10 to 20 percent below their intrinsic value. Eckbo & Thorburn (2008) also reported heavy discount on distressed acquisitions were firms was sold piece by piece in bankruptcy auctions in Sweden. Fire-sales is characterized as a non-liquid asset sold quickly with a heavy discount to compensate for the illiquidity in the market. Such action is often necessary to hinder bankruptcy. The basis for this is the targets limited options to prevent bankruptcy. A firm is facing financial distress if it holds inadequate liquidity to fulfill its short-term debt obligations. The firm can either raise capital, sell its assets or renegotiate with creditors to stay in business. If renegotiating and capital issuing is not possible, the firm is forced to sell off its assets.

An acquirer can therefore increase its wealth and competitiveness by absorbing smaller distressed rivals with a significant discount (Bruton et al., 1994). This lucrative business has gained lots of attention from different potential buyers in related- or non-related businesses. Besides the buyers, who are searching for lucrative investments, the topic has also gained attention from different governments, because of its harmful implications for the society.

1.2 Literature review

The purpose of the following section is to give an overview over the existing literature within the research field of how financial distress affect asset prices. This will give a comprehensive overview over the literature and help to investigate where in the literature the research is lacking. The purpose is furthermore to find a niche where this paper can contribute to give a better understanding of the field. First, in section 1.2.1 there will be a review of the general theories of fire-sales. Second, in section 1.2.2 there will be a review of how fire-sales affects the price of real assets. Third, in section 1.2.3 the literature review will examine the fire-sales effect on financial assets. Finally, in section 1.2.4 a review of literature on fire-sales in mergers and acquisitions will be carried through, which is also the main focus of this paper.

1.2.1 Fire-sales in general

If a firm is financial constrained, the firm can take several actions. One option is to make a voluntary restructuring (Donaldson, 1990). Another option for the firm is to restructure its operations and financial claims under protection of bankruptcy or privately restructure its debt (Gilson et al., 1990). However, these attempts to restructure and renegotiate the debt often fails due to information asymmetry between the firm and its debt holders (Asquith et al., 1994; Brown, 1998). Finally, asset sales can be a way of resolving distress (Asquith et al., 1994; Shleifer & Vishny, 1992), which is within the scope of this paper.

When a firm faces financial distress, it is connected with both direct and indirect costs. A lot of research has been widely explored within this field. However, the research within the indirect costs are narrow. One indirect cost associated with financial distress is price discounts associated with distressed sales of assets which will be the main focus of this paper.

There I no doubt, that fire-sales is an indirect cost which occurs. But why does it exist? Shleifer & Vishny (1992) presents a theoretical framework with some conditions for a fire-sale to occur. They predict that firms with asset there has a high degree of specificity are the most likely to experience fire-sales discounts. In more general terms, they state that illiquidity is the main source of fire-sales discounts. They also state that a fire-sale is more likely to occur when the industry faces distress. The reason for this is that there will be less peers with sufficient capital to purchase the firm. Williamson (1988) also reports that asset specificity is one of the key determinants of fire-sales. He also states that assets with a high degree of specificity are less redeployable. Hence, the real assets will experience a large discount when faced with the prospect of sales due to the illiquidity. After going through the theories of why fire-sales happens it is natural to look on the empirical evidence. The empirical evidence of fire-

sales discount on different types of assets will be examined through the literature review. First, the fire-sales discount of real assets will be discussed.

1.2.2 Fire-sales effect on real assets

In the last decades, there have been an increasing interest among researches on how fire-sales affect real asset prices i.e. how financial constraints forces firms to liquidate their assets below fundamental value. Real assets deviate from financial assets because they often are built for specific purposes and have few alternative uses. When a firm faces distress, it is often forced to liquidate the real assets into an illiquid market at a price below its fundamental value. Many of these studies which examines the fire-sales effect on real assets consider stock price reaction to the liquidation announcement. Where a positive reaction implies that the assets are not liquidated below fundamental value. However, there is conflicting results between the studies. Brown et al. (1993) examines asset sales by financially distressed firms. They find that return to shareholders are significantly lower when the proceeds are used to repay existing debt rather than retained by the firm. If the proceeds are used to repay debt holders the shareholders have a little incentive to sell the assets because it does not benefit them. Furthermore, their results show that debt holders have significantly impact on the liquidation decision of assets when the firm faces financial distress.

Lang et al., (1995) supports the findings of Brown et al. (1993). They argue that assets sales are likely to be associated with distressed firms that cannot or have difficulties obtaining capital through the debt and equity market. They find that an important determinant of the stock price reaction to an asset sale announcement is how the proceeds are used. Their results show that the stock price only reacts significantly positive when the proceeds are paid out to the shareholders. However, their results are conflicting when the proceeds are used to repay the debt holders instead of being retained inside the firm. They find a larger abnormal return when the proceeds are used to repay debt instead of retained by the firm which is the opposite of Brown et al. (1993). They argue that it is due to the rise of agency costs when the firm has excess slack i.e. cash surplus.

The two previous studies both focused on stock price reaction due to announcement of asset sales. The reason why the studies investigate stock price reactions are because data constraints makes it hard to investigate fire-sales effects directly. However, some studies have been able to make a direct test of fire-sales effect on real assets by selecting markets or industries with available data. Pulvino (1998) provides the first empirical evidence of the fire-sales effect on real assets by examine the price of used aircrafts. His results show that financial constrained firms receive lower prices for their aircrafts than their unconstrained rivals do. Furthermore, the

results show that financial constrained firms are more likely to sell their assets to industry outsiders especially when the market are performing poorly.

Eckbo & Thorburn (2008) is testing fire-sale tendencies in automatic bankruptcy auctions. They find empirical evidence for fire-sale discounts when the auction leads to a piecemeal liquidation, but insignificant fire-sales discounts for going-concern sales. Campbell et al. (2011) examines foreclosure discounts on the real estate market. They report fire-sales discounts of 27 percent when houses were sold after foreclosure in Massachusetts.

One common feature in the literature is that the fire-sales effect on real assets is examined from the targets point of view. Neither of them present evidence of fire-sales from the acquirers' viewpoint. To study this from the viewpoint of the acquirer one would have to look at the wealth transfer from target to acquirer.

1.2.3 Fire-sale effect on financial assets

In the literature, there is also studies, which examines the fire-sales effect on financial assets. Fire-sales of financial assets have wider effects than fire-sales of real assets because the institutional financial investors liquidity can be withdrawn quickly. The institutional financial investors sensitivity to an immediate stop in short-term financing can lead to series of liquidations. This will make the security prices decline when the investors suddenly are forced to liquidate their assets. Shleifer & Vishny (1997) constructs a model there explains why fire-sales of financial assets happens. They construct a model there connects limited arbitrage and fire-sales. In the model arbitrageurs experience capital withdrawal when their performance is poor. They consider an arbitrageur which bets against mispricing of securities with funds raised from outside investors. The arbitrageur knows with guarantee that the mispricing will disappear after some time and the securities price will go back to its fundamental value. However, the investors are outsiders and when the mispricing gets extreme many of them will withdraw their money. This is because they do not know if the losses are temporary or due to a wrong strategy from the arbitrageur. Therefore, they may withdraw their money when the mispricing is extreme and the arbitrageurs has to reduce their positon. It is highly unlikely that the arbitrageur follows a unique strategy so they all faces fund withdrawals at the same time. The arbitrageurs start liquidating their positions and the mispricing goes even further from the fundamental value. This disturbance causes the fire-sales of financial assets and the self-reinforcing effect can potentially lead to a collapse of the market.

Gromb & Vayanos (2002) present a related model. Where fire-sales also leads to widening in the mispricing of the financial assets. In their model the increase in mispricing force the arbitrageurs to deleverage. This increase the mispricing even further. This is due to the decrease in collateral values.

Besides the theoretical studies within the literature, fire-sales of financial assets have also been studied considerably in empirical research. Coval & Stafford (2007) investigates institutional price pressure in equity markets. They find that funds that experience capital outflow tends to decrease their positions as predicted by the Shleifer & Vishny's (1997) model. Furthermore, they find that stocks sold by distressed mutual funds experience abnormal returns on -7.9 percent, which is also predicted by the model. Ellul et al. (2011) investigates fire-sales of downgraded corporate bonds induced by regulatory constraints imposed on insurance companies. They report significant price discounts below fundamental value. Jotikasthira et al. (2012) finds fire-sales effects in the equity prices in emerging markets. This fire-sale effect is caused by the cash outflow from emerging- to developed markets. Acharya et al. (2007) widens the scope and investigates the whole US corporate debt market. They show that asset specificity of corporate assets is linked with poor debt performance. This is in terms of low recovery rates of defaulted firms. The evidence is even stronger in times with industry- and firm-level distress.

1.2.4 Fire-sales in mergers and acquisitions

The first in the literature to transfer fire-sales theory to mergers and acquisitions and examine the fire-sales effect on these was Officer (2007). The main focus of the paper was to investigate how the acquisition discount was affected if the target was unlisted. However, the findings are still relevant for this paper. The paper finds that unlisted targets are acquired for 15 to 30 percent less relative to acquisitions multiples for comparable publicly traded targets. The discounts are even higher for unlisted targets when alternative sources of financing are costlier and difficult to obtain and if the target face distress prior to acquisition.

The first in-depth study of how fire-sales affects the outcome in mergers and acquisitions was Ang & Mauck (2011). They examined acquisitions in crisis and normal periods of the world economy. They found that distressed targets receive a 30 percent higher premium during a crisis than distressed firms in normal periods. They also receive a 34 percent higher premium than non-distressed firms during a crisis. They further investigate the fire-sale from the acquirers' point of view but do not find any abnormal gains both in the long-term.

Khatami et al., (2015) also focus on both the premium paid to the target and the wealth transfer to the acquirer. They find that the financial constraints of targets significantly increase the acquisition premium that is paid. Furthermore, they also find that financial constraints also give significantly abnormal returns for both the acquirer and target. Finally, they also show that financial constraints are the key determinant of a takeover bid. These findings support that acquisitions may improve the ability of the financial constrained firms to get easier and cheaper access to alternative funding.

Meier & Servaes (2015) finds that firms that buy distressed assets in a fire-sale acquisition earns higher abnormal returns than in a normal acquisition. Their results also show that the returns are higher when the target's industry is distressed and the assets of the targets are less redeployable.

Oh (2014) tests the impact of distress on acquisitions outcomes. He finds that a targets firm- and industry-level distress is a significant determinant of acquisition outcomes. The results show that distressed targets in financial constrained industries are sold at significant discount, which is consistent with Shleifer & Vishny's (1992) theory. He also finds that acquirers gain positive and higher announcement returns in fire-sales acquisitions and that fire-sales targets are more likely to be sold to industry outsiders. He finds that the fire-sale discount is most significant when the industry outsider acquirers a target with less redeployable assets. Finally, he reports that fire-sale acquisitions is negatively affecting the targets industry rivals stock returns. This is due to dispatching of negative information without any changes in the fundamentals.

Kim (2018) investigates the prediction of Shleifer & Vishny's (1992) theory namely that assets, which has a high degree of specificity are most likely to experience fire-sales discount. This is because of low liquidity outside the industry. He finds empirical evidence which supports that the firm value of the target is significantly negatively affected by the asset specificity. He also finds that when the targets industry is distressed, one-standard deviation increase in the targets asset specificity, reduces the targets announcement return with -4.76 percent. If both the target and the industry are distressed one-standard deviation increase results in a decrease of -20.9 percent of the targets announcement return consistent with Shleifer & Vishny's (1992) theory. Furthermore, Kim (2018) finds that the negative effect of asset specificity is reduced if the target firm has access to easy and low-cost alternative funding.

Bruton et al., (1994) examines the post-merger performance of distressed firms. They find that acquisitions of related distressed firms result in a better post-merger performance than unrelated distressed firms. They find that pre-merger experience of the acquirer has a positive effect on the post-merger performance when acquiring a distressed firm. However, they find no evidence that relative firm-size have an effect on post-merger performance.

1.3 Problem statement

As seen in the literature review in section 1.2 the fire-sales effect in real- and financial asset transactions has been widely documented. However, focusing on acquisitions provide a number of benefits compared to real asset transactions. First of all, human capital and patents are transferred with the change of ownership in the acquisition. Furthermore, acquisitions have the advantage that it is easier to investigate the properties that determines the discount of the distressed firms assets. This is due to buyer characteristics and returns being observable while there is limited data on real asset transactions. The majority of the previous literature who have examined the fire-sale effect on real assets has focused on the losses suffered by the sellers of the assets. Therefore, this paper will have a different scope. The focus will be on the counterpart, more specifically how these distressed asset transactions affects the wealth of the acquirer. Furthermore, the scope of this paper will be the European market. This has not been conducted in previous literature. This leads to the main question that this thesis is addressing:

Which properties determines the discount in distressed target acquisitions and how does this affect the wealth transfer to the buyer?

In the process of answering the main question. The paper seeks to answer the composed sub-questions. First, it is relevant to clarify why firms engage in acquisitions, since it provides a general foundation and gives a common on understanding for acquisitions through the paper.

Why does firms engage in acquisitions?

After clarifying why firms engage in acquisitions it is relevant to examine why firms become financial distressed. To understand this, it is relevant to understand why firms undertake risky debt in the first place and how firms choose their debt levels.

Which theories can explain how firms choose their capital structure?

After examining how firms choose their capital structure it is relevant to see if there is some cost associated by imposing risky debt.

Which costs arises from risky debt?

One of the costs of risky debt is financial distress. To give a common understanding and provide a general foundation for the paper it is relevant to clarify what financial distress is.

What is financial distress?

After examining what financial distress is, it is relevant to clarify what consequences it leads to.

What is the consequences of financial distress?

Another aspect of the main questions is what determines the discount of distressed targets. This makes it relevant to see if there is some theory there can help explain these properties.

Which theories can explain the discount of distressed targets?

The last part of the main question is how acquiring distressed firms affect the wealth of the buyer. Therefore, it is relevant to see if there is some characteristics of the buyer, which influence the wealth transfer to the buyer.

What characteristics of the buyer influence the acquisitions outcome?

For the subsequent analysis to be relevant, it is necessary to test whether distressed targets are traded at a higher discount compared to non-distressed targets

What is the average difference in abnormal gains between buyers of distressed targets and non-distressed targets on the European market?

The next sub-questions seek to examine, which implications of existing theories there can help explain the discount of distressed targets on the European market.

-Which properties of the theories can help explain the discount of distressed targets?

At last, it is interesting to clarify which practical implications there arises from the findings in this paper.

What practical implications arises the results?

1.4 Delimitation

The paper is delimited to only consider the European market. Furthermore, only completed acquisitions are considered. This implies that all targets and acquirers have to be from Europe. The paper is also delimited to only consider deals available on the deal database Zephyr, which is the most comprehensive deal database when considering the European market. The paper only considers deals performed in the time frame from 01.01.2008 to 31.12.2017 because accounting data is not available before 2008 on the accounting database, Orbis. Furthermore, the paper is delimited to only focusing on acquisitions where the acquirer is listed with stock data available on Datastream, in the event window, so it is possible to access performance. Despite that, both target and acquirer has to be listed on Orbis during the event window. The study will focus on the wealth transfer of distressed acquisitions relative to non-distressed acquisitions. The study is therefore delimited from examining the actual gains and losses to the acquirer.

1.5 Theory of Science

In this section the scientific theoretical point of view, as the paper is developed from, is described. There is many different worldviews and paradigms. Because of that it is considerably to be clarified, which paradigm there is the background of this paper. This paper will be based on Guba & Lincoln's (1994) definition of a paradigm.

Guba & Lincoln (1944) is defining a paradigm as a basic belief that is guiding the researcher. It is a way to understand how the world is connected and functioning. These beliefs are based on faith. It is not possible to test the truthfulness of paradigms (Guba & Lincoln, 1994). If it were possible to falsify paradigms the true paradigm would have be pointed out. Guba & Lincoln (1994) distinguish between four main paradigms; positivism, post positivism, critical theory and constructivism.

A paradigm is based on three different levels; ontology, epistemology and methodology (Guba & Lincoln, 1994). Ontology describes the most basic assumptions of what reality is. It tries to uncover 'how things really are' and 'how things really work' (Guba & Lincoln, 1994). Ontology is only concerned about existentialistic matters.

The epistemology is explaining the relationship between the knower and what can be known (Guba & Lincoln, 1994). The epistemology is constrained of how the researcher looks at the reality. This means that epistemology of something have to fit into its ontology assumption. This force the researcher to argue within the acknowledged worldview. The epistemology is also concerned about uncover to what degree of objectivity the knowers is presenting his findings. A basic concern about objectivity could be to what degree the researcher has personal interest involved.

The last level is the methodology. This is about how the researcher can create and collect new knowledge and expand what is known (Guba & Lincoln, 1994). The researcher's choice of method has to be consistent with his choice of ontology and epistemology. This means that his prior choices have an impact on which methods he applies (Guba & Lincoln, 1994). A typical distinction is the qualitative- contra the quantitative approach. A quantitative approach wants to limit human intervention and solve a problem with scientific or mathematical evidence, whereas a qualitative study wants to collect different opinions.

These thoughts create the foundation of different ways of approaching a topic. It is important to nail down that no of the paradigms are superior to one another. All paradigms are human constructed and therefore a valid way of collecting data and explore new areas. The paradigms are also subject to human error because of their origins. It is just important to be consistent in the choices (Guba & Lincoln, 1994). Post positivism set the scene for a quantitative methodological approach and an approximately understanding of the truth. These properties are desirable for this study why this paradigm have been chosen.

Post positivism originates from positivism, which have been dominating research areas within physical and social sciences in many centuries (Guba & Lincoln, 1994). On the other hand, post positivism has now for some decades won more impact as a respected way of approaching social sciences. Post positivism has the same basic set of belief as positivism (Guba & Lincoln, 1994). The post positivism is looser than the positivism in the sense that reality is assumed to exist, but cannot be seen perfect due to human intervention. Things are not black or white from a post positivism ontology perspective, which they refer to as critical realism. Guba & Lincoln (1994) describes critical realism as:

> *"Reality is assumed to exist but to be only imperfectly apprehendable because of basically flawed human intellectual merchanisms and the fundamentally intractable nature of phenomena (Guba & Lincoln, 1994)."*

They mean that one can never see the truthfulness picture because human beings can never be flawless. This means that they accept one true reality that only approximately can be understood.

For this study, it means that the findings cannot be more than approximately true because of the fallibility as human beings. The implications of not being able to see the full picture is to acknowledge that one will never be able to know the truth. This worldview is a law of nature, which cannot be overcome.

The epistemology states that objectivity is not possible to maintain, instead it remains as a 'regulatory ideal' (Guba & Lincoln, 1994). This means that the study is aware of subjectivity biases and strive to remain as objective

as possible throughout the paper. Another factor, which is opposing the regulatory ideal is the fact that prior studies are also containing subjectivity due to human errors. It is therefore a critical factor for the study to use peer-reviewed research papers, as much as possible, because they are less affected by human errors and lesser affected by subjectivity because many researchers have reviewed and contributed to remove subjective biases.

The methodology within post positivism is characterized as manipulative (Guba & Lincoln, 1994). There is a focus on trying to falsify the hypothesis rather than verifying it. This means all hypothesis will be tested up against it null hypothesis. This is under the assumption of Karl Popper, which states that the tests have to be falsifiable in order to be scientific (Popper, 1962:36). This means that this study will have a hypothesis driven approach. This means that there will be set up hypotheses with the purpose of falsifying them. This approach is complimented by trying to test the hypothesis with different methods to strengthen the results. This is referred to as 'critical multiplism' (Guba & Lincoln, 1994).

Even though the critical multiplism encourage to use a mixed method design with both a quantitative- and qualitative approach, this study will solely be focusing on quantitative methods. The reason is that the qualitative methods is not suited for the nature of this study. Because mixed methods are more useful if one is going to find some underlying structures within the field caused of lacking existing theory. There are some well-founded existing theoretical frameworks within this field why it is not a necessary for the study to conduct a qualitative research. Furthermore, this study is interested in findings causal relationship existing in the market, rather than investigate how human beings interpret distressed target acquisitions.

This is an immediate weakness for this paper because the post positivism embraces the use of a modified dualistic approach. The latter argument also limits the use of different methods, which could contribute to uncover the topic from a different angle. However, this is an immediate weakness because the examination will not be able to capture all the nuances, which otherwise could be uncovered by a qualitative approach. Likewise, is there emphasized that all available data which fulfills the criterions are being taking into consideration with no exceptions. This will ensure a more objective approach and non-systematic errors is less likely to occur. To increase the robustness of the study several tests with different ways of measuring the same will be applied. This will decrease the non-systematic errors.

1.6 Research approach

There are two main ways to approach a problem. The inductive approach is where a researcher goes into the field and gather sufficient amount of data to develop a theory that explains a general tendency within his

academic field (Bryman & Bell, 2011: 13). The opposite is the deductive approach. By using a deductive approach, the researcher wants to test a phenomenon with existing theories (Bryman & Bell, 2011: 11). This study will have a deductive approach. This means that existing theories will be deduced on the empiric, where the purpose is to examine, if the theory can say something about the empiric. This will be used to explain different outcomes and tendencies in the market of Mergers and Acquisitions.

The process when using the deductive approach is to decide which theories that are suited for giving a reliable explanation. Next, the theories are made into research entities that will examined (Bryman & Bell, 2011: 11). Afterwards, relevant data will be collected to be able to falsify or verify the hypothesis. In the end, the study will present its findings. By using a deductive approach for the study, it can have some consequences. The approach of only using existing theories can affect the validity of the study because one can overlook things that the theory does not contain.

The nature of study will also be normative because the study will bring forth some practical advices for both, management, acquirers and governments of how things should be in an ideal world.

1.7 Validity and Reliability

This paper will rely on secondary data. This means that all data have already been gathered for other purposes than this investigation. The data have been gathered from reliable sources like Orbis, Zephyr, DataStream and Bloomberg. By using trusted databases licensed by Copenhagen Business School enables the study to define the outputs as reliable. This also means that anyone should be able to repeat this study and end up with the same data (Bryman & Bell, 2011:41).

The validity of the paper is secured by applying peer-reviewed journals and literature. This means that the theories and approaches that are applied throughout the study are all acknowledged as valid theories and measures. The objective is to end up with findings that are approximately equal to the real world (Bryman & Bell, 2011:42). The study will also strive to use original working papers to address and explain the essence in the theories (Bryman & Bell, 2011:159).

The last thing to emphasize is that the study has some difficulties in collecting some key data, which has caused some suboptimal choices to be made. This could reduce the validity of the empirical study in some of the hypothesis because the alternative variable might not be able to catch the all effects or measure the right thing.

1.8 Structure

The paper is structured as seen in figure 1 below. The study will start with a brief introduction of the background and a literature review. This will lead to a problem statement where a problem will be formulated and a delimitation will be set to narrow down the scope of the paper. The theory of science is then discussed and an attitude towards the topic will be chosen.

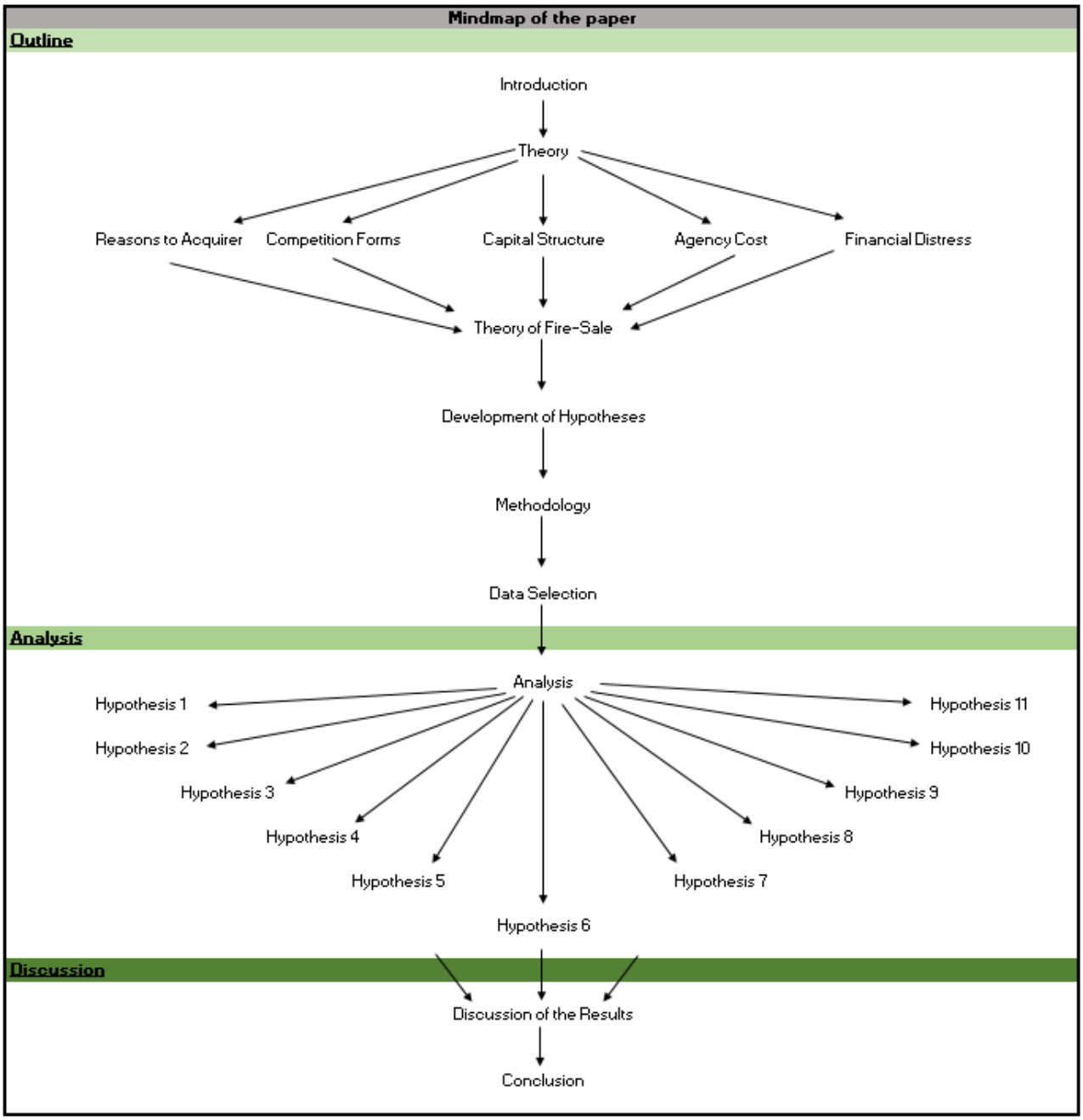
Afterwards will the theoretical framework which the study is based on will be explained, these theories will constitute the foundation of the main theory used in the paper. These theories can be seen in the figure below. After the theoretical assessment a narrower theory regarding the topic, distressed target acquisition, will be examined and a model of how to interpret and understand fire-sale.

With the explained theory kept in mind the study will develop relevant hypotheses, which will be able to cover the problem statement. After the formulation of the hypothesis the methodology of the study will be discussed and chosen. The methodology will explain how the study will test and approach the developed hypotheses and which choices there have been made to come up with the results.

After the methodology have been discussed the relevant data will be collected and shaped to fit the following analysis. In the analyses the hypotheses will be tested on the collected data and the results will be interpreted whether the study is able to reject or accept the null hypothesis. Afterwards, both theoretical implications and practical implications of the results will be discussed.

The structure of the paper can be seen in the figure below. It is illustrating the how the study is structured in sections:

Figure 1 - Structure of the paper



**Of one's own make*

2 Theory

This chapter will examine the relevant theories to give a common understanding through the paper and theories useful to develop the necessary hypotheses to answer the problem statement.

2.1 Reasons to acquirer

It is essential to understand why firms merge before examining why one would expect firms that faces financial distress to perform differently from non-distressed firms. To answer the question why firms merge an overview of existing literature of mergers will be examined. The idea of a merger is that the two firms combined should have a higher value than the two firms alone. However, theory and empirics shows that this is not always the case (Weitzel & McCarthy, 2009). The theories regarding merger incentives can be divided into two main categories; value increasing theories and value decreasing theories (Weitzel & McCarthy, 2009). This paper will treat the motives for mergers and acquisitions proposed by Weitzel & McCarthy (2009). These motives can be seen in table 1:

Table 1 - M&A theories of reasons for mergers

Effect	Beneficial part	Motivation	Gains/losses
Gains	Owners	Efficiency	Operative synergies
		Market power	Wealth transfer on expense of customers
		Corporate control	Mangerial synergies
Losses	Management act in good faith but do not benefit owners	Hubris	Loss throught overpayment
		Managerial discretion	Loss due to valuation mistakes
	Managers	Entrenchment	Losses implied because management acquirer to strenghten their jobs security
		Empire building	Losses implied because management acquirer target to increase the size of the firm

**Of one's own make with inspiration from Weitzel & McCarthy (2009).*

The above table is summarizing the different motivations of engaging in an acquisition, these will be examined in the following sub-sections. It can be seen that the green colored motivations are the ones that benefits the company. The interest between owners and agents are aligned, which is resulting in value increasing merger and acquisition activity. The first two red colored motivations, hubris and managerial discretion, are when the management is in good faith and act in the interest of the owners. Even though they have good intentions they

fail because of their bounded rationality where the synergies does not get exploited. The last two motivations are agency costs, entrenchment and empire building, were the management is utilizing their own wealth on the expense of the owners.

2.1.1 Value increasing theories

2.1.1.1 Theory of efficiency

The theory of efficiency states that a merger will only occur, if the deal is expected to generate enough synergies so it becomes beneficial for both parties (Weitzel & McCarthy 2009). These synergies can both result in increasing revenue through economics of scope and scale or/and reduced costs (Gugler et al., 2003; Helfat & Eisenhardt, 2004). Another efficiency gain can be through technology. Firms can acquirer targets with superior technology there is different from their own. By doing this they can gain a competitive advantage over their competitors. This can potentially increase revenue through innovation, which would have been costly to develop internally. It also gives the firm a possibility to achieve technology that it does not have the internal capabilities to do on their own (Granata & Chirico, 2010).

Banerjee & Eckard (1998) investigates the first great merger wave. They find evidence for that the mergers were significantly value increasing and attached this to increased efficiency. Mukherjee et al. (2004) adds to this finding that the efficiency gains is attributable to operating synergies.

2.1.1.2 Theory of market power

Another possible synergy associated with mergers and acquisitions is increased market power. The reason for this synergy gain is because when the firms market power increases the ability to extract consumer surplus also improves. This is also known as collusive synergies (Chatterjee, 1986). Trautwein (1990) points out that collusive synergy gains should not be confused with synergy gains from efficiency. This is because collusive synergy gains only represent the increased wealth transfer from customers to firms. It is primarily through Horizontal mergers that firms can gain increased market power, but vertical mergers can also give increased market power because backward or forward integration might increase the entry barriers for potential competitors. A Market with high entry barriers intuitively attracts less new firms to the industry and hence lower the competition (Gugler et al., 2003).

The existence of collusive synergies is documented in several studies. Sapienza (2002) finds evidence from studying mergers of banks. The results show that as the market share increases, the efficiency gains are offset from market power. Kim & Singal (1993) studies the airline industry. They find that merging firms tend to increase

their prices. Price increases are in line with economic theory about monopoly where firms can increase their prices from the equilibrium price as the competition decreases.

2.1.1.3 Theory of corporate control

Manne (1965) first suggested the theory of corporate control. The theory states, that when a firm is underperforming because of poor management there is always another management team willing to acquirer it. The rationale is that the acquirer will then replace the management and hence make improvements that increases the performance of the firm. It is these inefficient managers who supply the market for corporate control (Manne, 1965). If all firms had an optimal management, there would be no reason to replace them. Hence, the market for corporate control would not exists. The theory of corporate control differs from the theory of efficiency in two important ways. First, there is no assumption about synergies between the two firms assets. The synergy gains are on the other hand a result of synergies between the acquirers' managerial capabilities and the targets assets. The theoretical foundations of Manne (1965) are supported by empirical evidence. Hasbrouck (1985) find that firms with a low Tobins q, which in the study are used as a measure for managerial incompetence, is more likely to be acquired. This supports the theory of corporate control.

2.1.2 Value decreasing theories

This section contains the motives for mergers that is associated with losses. First, the theories where the losses occur due to bounded rationality will be described. Afterwards, theories where the losses occur because of agency costs will be described.

2.1.2.1 Theory of managerial hubris

The theory of managerial hubris indicates that even if the mangers have good intentions, where they seek to increase firm value through the merger, overconfidence on own abilities may result in the opposite (Roll, 1986). This is because overconfident managers may overestimate the potential synergy gains and thus pay a too high price for the target. Another reason for why some managers might pay a too high price is competition. High competition among bidders are also likely to result in the acquirer paying too much because of the managerial hubris (Roll, 1986). The managements overconfidence will result in one of the bidding firms is overestimating the real value of the firm and are therefore contributing to the winner's curse (DePamphilis, 2014:11).

Berkovitch & Narayan (1993) finds strong evidence for the theory of managerial hubris when looking on acquisitions with positive gains. They find that there is no significant correlation between acquirer and

target gains. One would expect to find correlation if the only motive is synergies. They state that one the explanation could be managerial hubris.

2.1.2.2 Theory of managerial discretion

Jensen (1986) propose a theory of managerial discretion. He argues that excess free cash flow is the main driver behind unsuccessful mergers and acquisitions. He suggests that capital structure could be an effective way to avoid overpaying for the acquisitions. Managers with excess liquidity are expected to invest that liquidity into positive net present value (NPV) investments to secure continuation of growth. However, when they run out of positive NPV investments they are likely to invest in less certain investments to fulfill these expectations.

Malmendier & Tate (2008) finds a relationship between internal financing and carrying out a value destroying acquisition. Managers who are not tied by capital structure are more likely to make quick strategic decisions. They also put less effort into analysis of the target than their peers who are tied by capital structure.

2.1.2.3 Theory of managerial entrenchment

Shleifer & Vishny (1989) describes how managers entrench themselves by making investments that minimize the risk of replacement. They claim that managers make investments not to maximize firm value but to increase their own individual value to the firm. Entrenching managers will according to Shleifer & Vishny (1989) make investments in manager-specific assets there makes it costly for the shareholders to replace them. To entrench themselves managers will buy very specific assets, which increase the complexity of the firm and make the harder to replace. The manager will by these specific assets if it raises the difference in profit between themselves and the next best manager even though it reduces shareholder wealth (Shleifer & Vishny, 1989). Another thing the management will do to secure their job is to engage in mergers of unrelated business, conglomerate mergers, which decrease the volatility of the cash flows that enhances corporate survival and hence increase their job security (Weitzel & McCarthy, 2009).

2.1.2.4 Theory of empire building

Another theory of why firms do mergers and acquisitions is empire building. It states that managers acquirer firms to maximize their own utility instead of with the purpose of increasing firm value (Trautwein, 1990). Managers does this to generate fast growth so they will be able to extract benefits related to running a large company. Benefits related to running a larger corporation could be larger salary, reputation and prestige. These benefits maximize the mangers utility but not the firm value.

2.2 Competition forms

In extension to the monopoly gains, described in section 2.1.1.2, it is relevant to introduce competition theory. Roughly speaking the paper distinguish between two competition forms, perfect competition and monopoly. The gab in between are hybrids, which is a combination of the two types.

When a monopoly emerges, it is damaging the public welfare, because of a welfare loss occurs. A monopoly typically implies that the firm can control the price. This means that they can produce less and raise the price. If new competitors are entering the market, the firm can drop the price and frighten off potential competitors. It is important to note that the price drop is only temporary. A monopolist will always maximize his own gains in the long run by raising the prices on expense of the consumers. A monopoly can arise if barriers to entry are difficult to overcome (Graham, 1992: 125).

When they are lowering their prices, the average revenue is decreasing as a function of price and quantity. Their marginal cost can also be reduced because of economies of scale. This enables the firm to produce below the costs of what new entrants can do. The gab in between is characterized as the welfare triangle (Graham, 1992: 196). Because of this welfare loss there is associated with monopoly the government has made some regulations. The purpose of the regulations is to ensure a fair competition and prevent market participants for gaining monopoly power. This implies that the government is prohibiting some firms in buying each other because it would result in a too high welfare loss for the society if the firms gained too much market power.

The opposite of such a market form is the perfect competition. This form strives to achieve a pareto optimum (Graham, 1992: 196). A pareto optimum is where it is impossible to move to another allocation without making other people worse or better off (Graham, 1992: 196). In the pareto optimum everybody is achieving the highest possible output. This ideal is also what perfect competition is striving after. A perfect competition is when the welfare loss is blurred out and when the marginal cost is equal to the marginal revenue and equal to the average revenue (Graham, 1992: 196). In this state the public welfare is maximized. In other words, no one can profit in a market with perfect competition because as long as profit exists market participants will enter the competition.

The gap between monopoly and perfect competition is filled out with different hybrids of the two competitions forms. These hybrids are enjoying some of the welfare loss, which is on expense of the public good. Such welfare loss occurs when the price is above marginal costs and the firms are able to make a profit.

This can also be seen from a merger and acquisition point of view. Jensen & Ruback (1983) described the market for corporate control as an arena where different managerial teams are competing for the right to manage

corporate resources. This means that the different firms are bidding to takeover other corporation's resources. Jensen & Ruback (1983) reports that in general the targets shareholders is generating positive gains when takeover happens. They also document that the shareholder of the acquirer 'do not lose'. There can be various implications why the acquirers do not gain, a reason can be as mentioned before that managerial teams are competing against each to takeover corporate resources (Jensen & Ruback, 1983). The competition will continue until the gain is competed away. This can also explain why the acquirer is not gaining anything.

2.3 Capital Structure

Modigliani & Miller (1958) was the first to develop a theory that described the effect of financial structure on market valuations. The theory is building upon the market value maximization approach. The approach is grounded around a simple question, 'will the project, as financed, raise the market value of the firms shares?' If that is the case, the return is above its cost of capital and the project will be undertaken (Modigliani & Miller, 1958). The capital structure theory is based on two propositions. The propositions are based on two main assumptions.

The first assumption is classifying all firms into classes with equivalent returns, which only differs in size. This means that if the firms are size adjusted, their returns are identical in the entire class. The strength of this assumption is that all firms within the same class are homogenous. The assumption is subject to perfect markets and perfect competition. This means that all classes will end up in a market equilibrium, which will yield equal expected returns.

The second assumption is introducing debt into the equation. Modigliani & Miller (1958) is arguing that a firms ability to issue bonds is changing the market for shares. The reason is that each firm will have different preferences on how much leverage to undertake i.e. financial risk. This factor will eliminate the homogeneity within the classes (Modigliani & Miller, 1958). It is important to emphasize that all bonds are yielding a constant rate of return, and due to perfect capital markets are all traded in the same equilibrium i.e. the same price. These assumptions make the foundation for the first proposition, which states that the value of a firm is independent of its choice of capital structure. The value of the firm is equal to the present value of the cash flows generated by the firm (Modigliani & Miller, 1958).

This means that a firms value is unaffected by the managements choice of capital structure. Modigliani & Miller (1958) is also arguing that this relation can only be broken for a short period of time. Arbitrageurs will equalize the gab by exploiting certain trading opportunities. To pin out the important points here Modigliani & Miller

(1958) is arguing that there is a law of one price. This means that in order to meet the equilibrium criteria all shares must be traded at the same price, if adjusted for size. Another point to mention is that a firms value is unaffected by its choice of capital structure because the investor can lend or borrow on its own to achieve an alternative capital structure (Modigliani & Miller, 1958).

The second proposition is based on the first proposition. The second proposition is examining the relationship between equity and debt if the firm has leverage (Modigliani & Miller, 1958). They state that the firms cost of capital is an increasing function of its debt-to-equity ratio. This means that a firm can achieve a higher return by adding more debt. It is though important to emphasize that an investor can do the same by leverage up on his own. This makes the choice of capital structure irrelevant for the investor.

To sum up, this means that capital structure has no importance for firm value nor cost of capital. This is because an investor can decide on his own whether he agree or disagree with the firms debt policy.

Modigliani & Miller's view of capital structure is not applicable to the real world. This is due to the assumption about a perfect capital market. The real world is full of financial frictions why Myers & Majluf (1984) relaxed the assumptions a bit to come up with a competing theory. Myers & Majluf (1984) reports in a perfect capital market, the firm should undertake every investment project with a positive NPV by issuing new shares. If the management do so the investors will buy correct priced shares on average. They argue that in some point the management have to be more informed than their shareholders and is acting on the behalf of old shareholders (Myers & Majluf, 1984). This leads to the following argument that issuing new shares will dilute the gain of the positive investment opportunity for the old shareholders. This gives incentives to drop positive investment opportunities and not allowing new shareholders to join, which ultimately will reduce the firms total value. This is referred to as the issue-invest decision (Myers & Majluf, 1984). The issue-invest decision makes the scene for what they refer to as financial slack. Such slack is a firms cash holdings and the ability to issue risk free debt.

The rationale for holding financial slack is that they can undertake highly positive NPV investments without inviting new shareholders (Myers & Majluf, 1984). The excuses from the management to obtain financial slack is that they do not have to issue new equity when the market is undervaluing their firm (Myers & Majluf, 1984). The argument is that they do not want to reveal when their firm is overvalued. This dilemma arises because of asymmetric information where the managers have a superior information.

It also spares new shareholders to buy overvalued shares, because firms are signaling that their shares are overvalued when issuing equity (Myers & Majluf, 1984). Ultimately slack is used to avoid equity issuing when

good investment opportunities is happening, and is also helping avoiding conflicts between new and old shareholders (Myers & Majluf, 1984).

However, Myers & Majluf (1984) suggests that there is a natural choice of these financing options, a 'pecking order'. This is also, why their theory in general is referred to as 'the pecking order theory'. In general; internal financing is more favorable than external financing i.e. debt and equity issuing. Furthermore, they show that the management will always prefer debt over equity if a profitable investment opportunity is occurring (Myers & Majluf, 1984). Myers & Majluf (1984) states that there is no optimal capital structure. The capital structure is more a product of a hierarchical financing over time.

In a more recent research Taggart (1986) is finding evidence, which supports Myers & Majlufs (1984) theory, that there is a hierarchy of financing. He finds that firms will use their internal fund before reaching external funds. This is because dealing with external funds indicates that different excess costs will occur. Taggart (1986) also find evidence that an optimal capital structure is existing, if the assumption regarding perfect capital markets are relaxed.

Fama & French (2002) is also supporting that a pecking order is existing in the choice of financing investments. Their results reveal that firms are more willing to obtain debt over equity in order to undertake investment opportunities. Fama & French (2002) found that firms with less investments have higher book leverage. They also found a connection between profitable firms paying larger dividends than firms with lots of investments. Furthermore, profitable firms also tend to hold a larger fraction of debt than growth firms. This can be due to better borrowing capacity and less volatile earnings (Fama & French, 2002). In contrary to what Fama & French explored Frank & Goyal (2003) could report that the pecking order theory seems decreasing over time, this means that equity is becoming more important as a way of financing projects. They also find that minor public traded firms are not behaving as the pecking order theory predicts (Frank & Goyal, 2003).

Another competing theory to Myers & Majluf's (1984) 'Pecking order theory' is the trade-off theory.

Modigliani & Miller (1958) proposed that there is no optimal capital structure because of investor's ability to leverage up on his own in a world without any financial frictions. This might not be true when introducing imperfections such as tax and bankruptcy costs (Kraus & Litzenberger, 1973). Therefore, Kraus & Litzenberger propose a theory also known as the trade-off theory. They point out that the firm might end up in trouble if they cannot honor their debt obligations. Ultimately, this results in the firm will defaulting on its debt. In such a situation, the bondholders will claim ownership of the assets. It is well known that corporations have to pay tax

of profits. This also coincides tax relief when the firm owes money to a third party (Kraus & Litzenberger, 1973). This sort of tax relief is often referred to as a tax shield and can be exploited as far the firm can honor its obligations. When these imperfections are introduced an optimum is occurring. The optimum is where the firm can maximize its wealth, also known as the optimal capital structure (Kraus & Litzenberger, 1973). The optimum is where the firm is balancing between solvency and insolvency.

The theory has been further developed through time and have gain a lot of attention and is both been subject to tribute and critiques. Miller (1977) is questioning the theory by arguing that there is no optimal capital structure. He finds it puzzling that the bankruptcy cost has gained such attention. He says that the bankruptcy cost is out of proportion compared to amount a firm earns because of their tax shield (Miller, 1977). He also says that there is no empirical evidence of stating that firms are optimizing their capital structure because capital structures have not changed significantly throughout the years (Miller, 1977). Miller also points out that the tax shield is considerable less than the theory is suggesting.

Fama & French (2002) is also questioning the trade-off theory. They are reporting evidence in favor of both the trade-off theory and the pecking order theory. The question is which of the theories is deterministic of a firms choice of capital structure. Fama & French (2002) concludes that both theories have considerable weaknesses and state the no one can say which of the models that are determinant for the choice of capital structure.

Last Welch (2004) states that firms are not aiming to hold the optimal leverage ratio. Instead, it is a product of stock performance. He states that stock prices are the first order determinant for the firm capital structure (Welch, 2004).

2.4 Agency Costs

Before introducing financial distress and fire-sale theory it is relevant to introduce agency costs. The purpose of this section is to give a deeper understanding of why firms are becoming distressed and why risky debt is necessary even though it could ultimately end in bankruptcy.

Jensen & Meckling (1976) is defining the agency relationship as a contract, where the principal is hiring an agent to act on behalf of the principal, this involves giving the authority to make decisions. The principal refers to the equity- and debt holders, whereas the agent is the top management of the firm. The problem arises when both parties is maximizing their own utility, because what is best for the principal is not the same for the agent. This gives incentives for the agent to act in its self-interest (Jensen & Meckling, 1976). A way to prohibit the agent in doing so is to encourage and influence the agent to act in a certain way that are beneficial for the principal. The

cost of aligning the incentives of the agent is called the agency cost. Agency cost is a product of three components; the expenditures associated with monitoring the agent, bonding cost i.e. cost that encourage to make sure that agent do not harm the principal and residual loss, which is the cost of divergent interests. Jensen & Meckling (1976) distinguish between two types of agency cost, the ones that are related to equity and the ones that are related to debt. The primary focus in this paper is on debt, therefore only a brief overview of the equity related agency cost will be described.

2.4.1 Agency costs of equity

When an entrepreneur is owning 100 percent of the firm, he will act in a way that are maximizing the firm value. However, as the entrepreneur's equity stake is declining he will be more likely to overspend on perquisites to maximize his own utility (Jensen & Meckling, 1976). A reason for this is that the other owners pays a part of his perquisites. This behavior will encourage the outside shareholders to spend additional resources on monitoring activities to limit the manager of maximizing his utility on the expense of the outside shareholders (Jensen & Meckling, 1976).

2.4.2 Agency costs of debt

2.4.2.1 Excessive risk taking

Jensen & Meckling (1976) describes the debt related agency cost as when management engage in risky projects where the payoff is high but the probability of success is low. This also encourage the management to favor projects that yields the highest present value for the equity holders instead of what is best for the total firm value. Another aspect is if the firm is close to default, the management will be tempted to undertake risky projects. These projects can save the firm but in case of the default the costs will be borne by the debt holders. This is in the literature referred to as excessive risk taking. The dilemma is that most of the payoff will be entitled to the management if the project becomes successful, whereas the debt holders will take the loss if the project fails. A way to counter this agency problem is to constraint the management by imposing covenants (Jensen & Meckling, 1976).

2.4.2.2 Debt overhang

Myers (1977) discovered another agency cost called debt overhang. He explained why firms are choosing suboptimal investment decisions when they have risky debt outstanding. The premise of the theory is that the firm is acting in the interest of the shareholders. This means that the firm will choose projects that are favoring the shareholders and skip investment projects that will maximize the market value of the firm (Myers, 1977). In an all-equity firm all projects with a positive NPV is undertaken. However, if a firm have risky debt in place it will

discard some positive NPV investments. If a project, that would have been discarded, is undertaken only the debt holders would benefit while the shareholders will experience a negative NPV loss. This means that the potential investment could increase the total value of the firm, while the equity would experience a loss. Because of that, the investment will not be undertaken. This will end out in a suboptimal investment decision because they skip investments that would increase the value of the firm (Myers, 1977).

This agency cost is also known as debt overhang and is occurring once risky debt is imposed and the firms borrowing capacity is small. If a firm have a debt overhang it will have trouble in raising capital to a certain point. After the threshold, it will no longer be able to raise more debt, in fact promising a higher interest rate will lower the borrowing capacity (Myers, 1977). This implies that the investor cannot raise additional capital to fund new positive NPV projects. Myers conclude that the optimal capital structure is all-equity. However, as mentioned earlier in this section Jensen & Meckling (1976) states that all-equity financed firms are also associated with agency cost. Therefore, a pure equity financed firm might not be optimal either. Another reason why some debt can be advantageous is due to tax relief (Myers, 1977).

2.4.2.3 The leverage ratchet effect

Another agency cost is the leverage ratchet effect (Admati et al., 2018). The theory is suggesting that once leverage is in place, the management is not willing to reduce it even if it is increasing the value of the firm. If the management are forced to deleverage, shareholders are biased towards selling off assets rather than enter pure recapitalizations (Admati et al., 2018). This means that shareholders are more willing to sell off assets to raise funds to repay debt, rather than pay back debt with equity. The reason is that a leverage reduction is transferring wealth from the shareholder to the existing debt holders. This means that the probability of default is decreasing and the debt holder will recover a larger fraction of their loans granted (Admati et al., 2018). Ultimately a leverage reduction is on the expense of the shareholders because they cannot capture the benefit and will have to pay a premium if start to pay off the debt. The premium is the difference between the pre-recapitalization and post-recapitalization price. The reason is that the debt is becoming less risky and they therefore have to offer a premium for the debt holder to accept being paid back before maturity (Admati et al., 2018). This also decrease the shareholders willingness to take on risky projects as Jensen & Meckling (1976) was suggesting with their excessive risk taking theory. Admati et al. (2018) findings suggest that investors are against repaying debt and prefer to sell assets at fire-sale prices in order to avoid repaying debt. This helps explaining why firms are becoming distressed and why fire-sales of assets occurs.

2.5 Financial Distress

The purpose of this section is to give a general understanding of financial distress, which cost there occurs due to financial distress and how it affects the firm performance.

Financial distress is when a firm cannot meet, or have troubles meeting its debt obligations (Berk & Demarzo, 2014:539). A general view of why financial distress arises is that there is a mismatch between the currently available liquid assets and its current obligations of its financial contracts (John, 1993). While there is agreement among financial economists about the definition of financial distress, there is no consensus among financial economist on how financial distress affects corporate performance. In a perfect capital market setting, as in Modigliani & Miller (1958) described in section 2.3, there is no cost of financial distress. However, in the real world there exists financial frictions. As described in section 2.3, where there is an overview of the trade-off theory, financial distress is traditionally viewed as a costly event, which is an important element to determine optimal capital structure.

2.5.1 Cost of financial distress

Financial distress is viewed as costly due to several costs. One of the indirect costs there arises due to financial distress is loss of customers (Beck & Demarzo, 2014:544; Opler & Titman, 1994). This is due to the threat of the firm going bankrupt, where the firm walks away from it commitments, forces the customers to find alternative suppliers. Customers are not the only stakeholder that withdraw due to the financial distress. In case of bankruptcy the suppliers will lose their account receivables. If they fear they are losing their account receivables they will stop collaborate with the firm (Berk & Demarzo, 2014:44).

When a firm faces financial distress, it is also facing the risk of losing its key employees. If the firm cannot offer long-term job security some employees will start to look for alternatives and to retain the employees are costly (Berk & Demarzo, 2014:545). There is also a tendency to that debtors, who owe small amounts, try to hide and do not pay the money back. This is an indirect cost of financial distress (Berk & Demarzo, 2014:545).

An important indirect cost of financial distress are agency costs. This is one of the costs there is discussed most in the literature. Firms tend to make suboptimal choices on expense of debt holders and nonfinancial stakeholders (Opler & Titman, 1994). There are several researchers there have theoretical explanations of why these agency cost occurs. Jensen & Meckling (1976) argue that the agency costs of distress arises because of the ownership structure. They argue that individuals have a self-maximizing behavior. Therefore, when there is too much debt the manager has a little incentive to grow the firm size. According to them, it is the divergence of

employee and the owner's goals causing the agency problems. Myers (1977) argue that the agency costs related to issuing risky debt, is that the manager will let some positive NPV projects forego because they are not in favor of the shareholders. These sub-optimal investment decisions from the management is the main source of agency costs. Smith & Warner (1979) also finds that the actions of the shareholders tends to maximize the value of equity. With risky debt outstanding shareholders will take risk on the expense of the debt holders. These actions are harmful for the total firm value. They show that this agency costs can be reduced through payout policy and covenants written into the debt contract. The financial distress does not only encourage making suboptimal choices on expense of the debt holders but also the non-financial stakeholders including customers, employees and suppliers (Titman, 1984). Titman (1984) shows that the firm indirectly bears the liquidation costs that imposes on the customers in the future if it liquidates. The firm has to lower the current prices to make it up for the potential loss suffered by the customer in the future.

Finally, fire-sales of assets is also an indirect cost associated with distress. This cost is however, a key element in this paper, why it is described separate in section 2.6.

2.5.2 Enhanced performance caused by financial distress

Other researchers also suggest that financial distress can increase performance of the firm. Increased leverage forces the managers to make value maximizing choices which leads to increased firm value (Jensen, 1989; Wruck, 1990). Financial distress can also improve the firms bargaining power against labor unions. When the firm issues debt, and in case of financial distress too much debt, there is less cash flows available to the labor union to bargain about (Bronars & Deere, 1991; Dasgupta & Sengupta, 1993). Financial distress can also strengthen the bargaining position versus senior claim debt holders. If the firm currently not are earning enough to cover the senior obligations, and the payback of the senior claims rely on future investments, the firm can exchange junior debt for equity. By doing this the shareholders change their incentives to invest in the future. Hence, they can extract concessions from creditors with senior claims that was not possible if the firm has cash flows that was in excess of senior claims. (Perroti & Spier, 1993).

2.6 Fire-sales

As described in section 2.5.1 an indirect cost there can occur to a firm when facing financial distress is fire-sale of assets. Distressed firms may face a liquidity constraint because they do not have sufficient cash to pay its current debt payments. One of the opportunities to generate sufficient cash to pay its current obligations is by selling their assets. Such an asset liquidation is associated with liquidation costs. A liquidation might result in the assets being sold below fundamental value at a fire-sales discount. The liquidation costs and hence the fire-sales discount is determined by market liquidity. Market liquidity is in addition determined by asset redeployability and the credit constraints of the high valuation buyers. A high valuation buyer is a peer within the industry because they tend to have a higher fundamental valuation of the assets.

2.6.1 Determinants of liquidation value

When a firm with a large amount of debt is not generating sufficient cash flows to cover it interest it has two opportunities; either reschedule its debt or get liquidity from alternative sources. There can be several reasons for why the firm cannot issue additional debt. One reason could be that it is a consequence of adverse selection, also described in section 2.3, as suggested by Myers & Majluf (1984).

Another reason could be that the firm has too much debt and faces debt overhang (Hart & Moore, 1998; Myers, 1977). When the firm has no other options to raise capital, it has to liquidate their assets to repay the creditors. In section 2.3 theories of capital structure is described. Shleifer & Vishny (1992) adds some important points to the discussion of how to determine the optimal capital structure. According to them, the choice of capital structure is highly dependent on the value of the assets when the firm is forced to liquidate them.

When the firm has to liquidate their assets, there are (in most cases) three types of potential buyers (Shleifer & Vishny, 1992). The first type is industry outsiders. These outsiders can convert the assets to alternative uses. The second type is industry insiders who in most cases uses it for the same purpose as the seller originally did. The last type is financial investors who buy it with the solely purpose of reselling the assets. In the case where the assets are sold to firms outside the industry, the nature of the assets determines the liquidation value. The key determinant is the assets redeployability (Williamson, 1988). If the assets have several alternative uses i.e. are more redeployable then the liquidation value will be close to the fundamental value. However, if the assets have a high degree of industry specificity they will be sold at a lower price than the fundamental value (Shleifer & Vishny, 1922; Williamson, 1988). In other words, assets which is redeployable are more liquid. On the other hand, if the firm sell the assets to industry insiders the assets will most likely be sold close to the fundamental value, especially if there are many bidders. The rationale of the assets being sold closer to fundamental value is that

the buyer can use it for the same purpose. Thus, redeployability does not have an impact on the price if it is sold to industry peers. Furthermore, a buyer, which is an industry insider, has more knowledge about the quality of the assets and the quality of the seller. Therefore, the adverse selection problem is less important for industry insiders because of their knowledge about the industry (Shleifer & Vishny, 1992). If there are many bidders in the industry the price will also be closer to the fundamental value. This is due to the competition theory as described in section 2.2. Finally, the third type of buyers, the financial buyers, will need to have the current management running the firm or replace the management. When you have to hire employees to run the firm, it is associated with agency costs as described in section 2.4. Buyers from inside the industry do not face these agency costs because they can run the firm themselves. The financial buyer has to be compensated for these agency costs. Hence, they cannot pay the same amount, as industry insiders, and will have to buy the assets below fundamental value (Shleifer & Vishny, 1992).

In the real world most assets are specified, which means they are not that redeploayble. When the assets have low redeployability, the firm will have to sell the assets to a buyer there will use them in approximately the same way (Shleifer & Vishny, 1992). This further emphasize, that it is the most attractive deal for the seller, to sell the assets to a buyer from inside the industry. Unfortunately, this is not always possible. Regulations can restrict potential buyers inside the industry from doing so. Furthermore, if the seller does not face financial distress due to an idiosyncratic reason the peers in the same industry are highly well-likely to face the same financial constraints. They will not be able to raise sufficient capital to finance the deal (Shleifer & Vishny, 1992). This results in assets being sold to industry outsiders who does not face the same liquidity constraints. As mentioned earlier in this section the two types of buyers, who are not industry peers, have additional costs due to moral hazard, adverse selection and the redeployability. Therefore, they will have to pay a price lower than the fundamental value, a fire-sales discount (Shleifer & Vishny, 1992).

2.6.2 A model of fire-sales

To show why firms can be forced to sell assets below fundamental value Shleifer & Vishny (1992) propose an equilibrium model of how financial constraints in an industry give rise to a price drop below the assets fundamental value. This model will be examined in depth, as it will be a model a lot of the hypothesis will be developed from later in chapter 3.

First, consider a model with three periods. The model is based on an industry with only two firms. The capital structure of the firm is determined in $t = 0$. There are two future states in the world; prosperity and depression. The future state of the world is known in $t = 1$, at this time the firms will also have to make further decisions as

well as receiving and paying out cash flows. At t $= 2$ the firms receive the additional cash flows. If the world state is depression one of the two firms will be hit harder than the other firm. The model is based on three assumptions. First, investments in prosperity has negative NPV. Second, period one cash flow is higher in prosperity even net of the investment. Third, the overall cash flow is higher in prosperity than in the depression even net of the negative NPV investment (Shleifer & Vishny, 1992).

If the state of the world is prosperity the firms has the possibility of undertaking a negative NPV investment. The investors are facing a moral hazard problem, as the manager will undertake this project because it will benefit him personally. This is of course not in the interest of the investors. To prevent the manager from undertaking the negative NPV investment the investors creates a debt overhang. Debt overhang is described detailed in section 2.4.2.2. If the manager knows that the state is prosperity and the investors wants to prevent him from investing in t $= 1$ they need to issue debt:

$$I^P > Y_1^P - D_1 \ (1)$$

The firm issues short-term debt, D_1. This short-term debt has to be large enough so the manager cannot make an investment in prosperity. To prevent the manager for doing so in prosperity, the cash flow in t $= 1$, Y_1^P, net of the short-term debt has to be less than the required investment in prosperity, I^P. If this condition is satisfied the manager cannot make the investment without raising additional capital. However, the manager can still make the investment if he raises new capital. To prevent the manager from doing so the following condition needs to be fulfilled:

$$I^P - Y_1^P > Y_2^P + R^P - D_2 \ (2)$$

In equation (2) senior debt overhang is created. The way to create senior debt overhang is by issuing enough senior debt, D_2, so that the cash flow in t $= 2$ in the prosperity state, Y_2^P, and the NPV of the investment, R^P, does not exceeds the investment and cash flow in t $= 1$. This ensures that the manager cannot raise additional capital. To sum up when equation (1) and (2) is fulfilled the manager does not have enough cash to undertake the investment and cannot raise additional capital. Hence, he cannot undertake the negative NPV investment. When knowing the optimal debt levels to prevent the investment in prosperity the optimal capital structure is also known. The levels need to be slightly above the levels given in equation (1) and (2). The investors do not gain anything by raising the debt levels further why the optimal capital structure is where the manager cannot make the investment. This gives us an optimal level of short-term debt:

$$D_1 = Y_1^P - I^P + \epsilon \ (3)$$

And an optimal level of long-term debt of:

$$D_2 = Y_P^2 + R^P + \delta \text{ (4)}$$

The two terms ϵ and δ ensures that the debt levels are slightly above. These debt levels keep the firms from investing in the prosperity state. Remember, that the capital structure is chosen in $t = 0$. Therefore, the firms choose the capital structure before they know the state of the world. This means if the world state goes to depression the firms will face some costs. This is due to equation (1) and the second assumption $Y_1^D < Y_1^P - I^P$ which implies that $Y_1^D < D_1$. This means that the firms cannot meet their short-term debt obligations in the state of depression. The only way to avoid liquidation is by issuing additional capital. However, this is not possible in this case since the assumption of period one cash flows is higher in prosperity even net of the investment is made. Therefore, when equation (2) is fulfilled then it is not possible to issue additional capital in the depression state either. This can be written as follows:

$$D_1 - Y_1^D > Y_2^D - D_2 \text{ (5)}$$

As seen in equation (5) it is not possible for the firms to borrow sufficient funds to continue the operations. Under the assumption that it is not possible for the firm to reschedule the debt, the firm will not be able to postpone the liquidation by raising additional capital to pay the short-term obligations. As long as the depression state adequate worse than the prosperity state the firms assets will be turned over to the creditors in the depression state. The assumption is furthermore, that the creditors will liquidate the firm if it defaults on its short-term debt. If looking on what the minimum price for the assets should be from the seller's point of view. The price needs to be high enough so the capital structure described earlier is still optimal. The capital structure is only optimal if it fulfills the following condition:

$$\prod^P (I^P - R^p) \geq \prod^D (Y_2^D - L^D) \text{ (6)}$$

Where Π^P denote the probability of prosperity and Π^D is the probability of depression. As seen in equation (6) the gains from eliminating the agency costs in the prosperity state must outweigh the losses from liquidation. This is quite intuitive since it will not make sense for the shareholders to impose debt overhang if it resulted in a larger loss than letting the manager do the negative NPV investment, and not having the risk of liquidation. For the condition in equation (6) to be fulfilled the minimum acceptable price for the firm's assets, L^D, is:

$$L^D = Y_2^D - \frac{\Pi^P}{\Pi^D}(I^P - R^P) \text{ (7)}$$

Equation (7) is the minimum price of the assets for the capital structure to remain optimal. If the price is not as in equation (7) equation (6) is not fulfilled. This means that the investors experience a larger loss by imposing debt overhang than if they did not and let the manager invest. If they experience larger loss by imposing debt overhang the capital structure can obviously not be optimal.

Equation (7) states how much the price of the liquidated asset should be. However, if the firm is being liquidated the value is determined of how much a potential buyer can pay. In the following part the amount which the potential buyer can pay will be examined. The paper distinguishes between two types of buyers; inside the industry and outside the industry. The buyers outside the industry does not face debt overhang and can pay up to his period two cash flow, C_{out}, for the liquidated firm. On the other hand, there is a buyer inside the industry. This insider has also debt overhang. This firm, as mentioned earlier, are not getting hit as hard as the liquidated firm. The insider can generate a second period cash flow of $C_{ins} > C_{out}$ from the selling firm's assets. Even though the insider has a higher fundamental value of the assets than the outsider, it is not sure he can pay this valuation of the assets because of debt overhang. To examine what price the insider can pay Shleifer & Vishny (1992) assumes the following. First, investment in prosperity has negative a NPV: $r^P < i^P$.

The second assumption, $0 < y_1^D - y_1^P + i^P < C_{out}$ is a key element in the theory. The first part of the inequality ensures that the buyer has a high enough cash flow in depression so he does not get liquidated. If this was not the case the buyer would be liquidated as well. If the inside buyer is liquidated as well, there would be even more firms sold to lower valuation buyers outside the industry. The second part of the inequality implies that the inside buyer does not have enough internal cash to buy the liquidated firm for the same valuation as the outside buyers. If the inside buyer wants the liquidated firms asset it will have to raise additional capital.

Third assumption is that; the overall cash flow is higher in prosperity than in the depression even net of the negative NPV investment.

The inside buyers investors have made the same optimal capital structure as of the liquidated firm. However, as mentioned earlier they are not hit as hard as the liquidated firm. If this was not the case, they were liquidated themselves. To prevent the buyers management to make the investment in prosperity the following condition has to be fulfilled:

$$i^P > y_1^P - d_1 \ (8)$$

Where d_1 is the short-term debt of the buyer. The long-term debt of the buyer, d_2, is also chosen so the management cannot raise the necessary capital to undertake the investment, as it also was the case for the seller:

$$i^P - y_1^P > y_2^P + r^p - d_2 \ (9)$$

Equation (8) and (9) is the exactly same as equation (1) and (2) for the seller. Therefore, the minimum debt levels are intuitively also the same where the minimum short- and long-term debt levels for the inside buyer is:

$$d_1 = y_1^p - i^p + \epsilon \ (10)$$
$$d_2 = y_2^p + r^P + \delta \ (11)$$

The question is now can the buyer raise enough capital to acquire the seller in the depression state when the buyer is burdened by the short-term debt, d_1, and the long-term debt, d_2.

Let l^D denote the maximum price that the buyer can pay and still raise enough capital to pay for the seller. The buyer will acquire the seller if he has enough internal cash to do so or can raise sufficient capital. Assumption two implies that the buyer does not have sufficient cash to finance the deal with internal cash. The buyer can borrow to buy the seller if the following condition is satisfied:

$$l^D < (y_1^D + y_2^D) - (y_1^P + y_2^P + r^P - i^P) + C_{ins} \ (12)$$

Equation (12) is the key condition of the model. Keep in mind assumption three. This assumption implies that cash flows in prosperity will always be higher than cash flows in depression. Thus, will the first two terms, $(y_1^D + y_2^D) - (y_1^P + y_2^P + r^P - i^P)$, always be negative. This means that the buyer can only pay less than his fundamental value, C_{ins}, for the assets. Why is this the case? The simple answer is debt overhang. Without debt overhang the buyer would be able to pay his fundamental value of the assets of the liquidated firm, C_{ins}. However, as described in section 2.4.2.2 debt overhang prevent the manager in making some positive NPV investments. In other words, some agency costs occur. The debt overhang does in this case that the inside buyer can maximum pay, l^D, which is below his fundamental valuation. The agency costs in this case is the difference between l^D and C_{ins} in the case that the assets are sold to an industry outsider. If it should make sense for the investors to induce debt overhang on the firm and reduce the agency costs the gains from reducing the agency costs must exceed the losses from not being able to buy the liquidating firm:

$$\prod^P (i^P - r^P) > \prod^D (C_{ins} - \text{liquidation price}) \ (13)$$

If the condition in equation (13) fails then the investors will not impose the debt overhang in $t = 0$, since it would affect the firm value in a negative way since the buyer is assumed, just as the seller, not being able to renegotiate their debt contracts. The intuition behind equation (13) is that the costs associated with not imposing debt overhang for the inside buyers perspective should be greater than the difference between their fundamental value of the liquidated firm and the liquidation price. If the gain from reducing the agency costs of the manager is not greater than the potential gain from buying the liquidated firm, the capital structure is not optimal for the inside buyer. Hence, the investors in the firm would not impose debt overhang.

As seen in the model above the inside buyer tends to have financial problems when the sellers have it too. However, in some cases, when, $l^D > C_{out}$, the inside buyer will get the firm at a price which equals C_{out}. The insider will get the firm because he can utilize the assets more efficient than an outside buyer can. This could be the case when the seller is experiencing financial distress due to an idiosyncratic reason. However, if the distress is due to a reason there is systematic for the whole industry it is reasonable to think that $l^D < C_{out}$. When this is the case the outsider will buy the liquidated firm even though he cannot run it as efficient as the insider. When situation happens a fire-sales is occurring.

The key conclusions one can draw from the model, which is relevant for this paper, is that asset does not necessary getting allocated to the highest value user. In other words, the assets are sold at a fire-sales discount. Assets, which are less redeployable, can be sold below value in best use when there is an industry- or economic wide recession or in some cases where the antitrust laws prevent highest value users in buying the assets. Furthermore, asset liquidity changes over time. High markets tend to be liquid markets and low markets are viewed as illiquid markets, which means that the fire-sales discount changes over time.

2.7 Acquirer characteristics

A part of the main question of the paper is to investigate the wealth transfer to the acquirer. Therefore, it is relevant to examine which acquirer characteristics that could potentially affect the possibility for a turnaround of a distressed firm to be successful. First, size will be examined because larger acquirers relative to the target is believed to have the necessary slack resources to increase the probability of a successful turnaround. Afterwards acquirer experience will be examined because it is expected that through experience the management would gain some skills there is favorable for a successful turnaround.

2.7.1 Size

The foundation of these thoughts is based upon Brutons et al. (1994) research. They are examining if there are a connection between the post-merger performance and the targets size. The argument is that a larger target is catching the attention of the management in a higher degree than smaller ones. If the target is too small the management will not allocate sufficient attention and resources to the firm (Bruton et al, 1994). However, they are also mentioning that large related firms tend to increase investor estimates. Whereas, unrelated large acquisitions tend to do the opposite. Furthermore, they report that if a target is distressed, the acquisition is demanding the attention from the management (Bruton et al, 1994). The reason is that distressed firms is tangent to default and is therefore in need of sufficient financial aids. It is therefore crucial that the acquirer is large enough to absorb a distressed target.

Fuller et al. (2002) also reports that size is deterministic for the performance of the acquirer. They argue that the acquirering firm is gaining when buying a private firm compared to a loss when acquirering a public firm. Fuller et al. (2002) concludes that the effect on both is greater when the acquirer is larger.

Filipović (2012) found a connection that the smaller the firm is compared to the acquirer the more successful will the target perform post-merger. He is also concluding that for an acquisition to be successful it is crucial that the target firm is smaller than the acquirer.

2.7.2 Acquirer experience

Bruton et al. (1994) is also investigating if the post-merger performance is positive correlated with prior acquisitions undertaken. Jemison & Sitkin (1986) is stating that many well-intended acquisitions is often failing because of the complexity of the acquisition process. Bruton et al. (1994) is also stating that further complications can arise when acquirering a distressed target.

Fowler & Schmidt (1989) found evidence that prior acquisitions are positively correlated with the acquirers performance. Furthermore, older firms with acquisition experience is having the great probability of success.

Bruton et al. (1994) is also stating that one of the reason for an experienced merger to be successful is their ability to pick, which is continuously increasing with their experience. Bruton et al. (1994) states that experienced managers have a better understanding of the process and knows when to withdraw from an unfavorable business opportunity.

To sum up when the management have prior experience they have gained some turnaround skills there might affect the acquisitions outcome and the market should respond more positively to the acquisitions. Thereby, the wealth transfer should increase.

2.8 Sub-conclusion

Firm engages in acquisitions for various reasons. The study is considering value increasing and value decreasing motives. There was found three value increasing motivations for engaging in acquisition activity; Theory of efficiency, theory of market power and theory of corporate control. These theories are considering the economics of scope, monopoly gains and managerial synergies.

The value decreasing theories was built on two different main thoughts; bounded rationality and agency cost. The theories regarding bounded rationality was; Theory of managerial hubris and Theory of managerial discretion. The theories arise from managerial overconfidence and misevaluation, respectively. The other group of value decreasing theories were based on agency costs. In this group, there was two motives; Theory of managerial entrenchment and theory of empire building. The motives behind these mergers is to increase job security and enjoy the benefits from running a large firm.

However, even though firms want to buy each other, the government is sometimes prohibiting the deal. The reason for this was to prevent firms in getting monopoly power. If a firm has monopoly power, it results in welfare loss for the society. The role of the antitrust law is to secure fair competition and reduce the welfare loss for the society.

Afterwards, reasons why firms take on leverage was examined. The paper found that one reason for taking on leverage, could be to choose the optimal capital structure. The paper proposed several capital structure theories. Modligiani & Miller (1958) said that capital structure is irrelevant because the investor can use homemade leverage. Myers & Majluf (1984) said that there was no optimal capital structure but debt was a results of financing choices over time following a hierarchy of financing. Finally, Kraus & Litzenberger (1973) proposed that debt was an instrument to maximize firm value through tax advantages of debt but as a trade-off of higher bankruptcy costs.

After examining the different theories of capital structure, the paper could also conclude that there were disadvantages associated with imposing risky debt. These disadvantages were defined as agency costs, which is when there is a conflict of interest between the principal and the management. These agency costs were; excessive risk taking, debt overhang and the leverage ratchet effect.

When the firm is adding too much debt the firm will start to face financial distress. Financial distress is when the firm has trouble meeting its debt obligations short-term. It was concluded that financial distress could increase performance but it was also associated with some costs. Among these costs was fire-sale of assets.

The paper found that several factors where determining the fires-sales discount of assets. Shleifer & Vishny (1992) showed that illiquidity was the main fire-sales channel. It was found that illiquidity was determined of asset redeployability, industry conditions and general economic conditions. Williamson (1988) also mentioned asset redeployability as a fire-sale channel. Another implication of Shleifer & Vishny (1992) is that competition within the industry is also an important channel of fire-sale.

Finally, it was concluded that acquiring a distressed firm is a complex task and requires some resources and turnaround skills. The study found that relative size and acquisition experience would provide the management with sufficient resources and better skills to make a successful turnaround that could possibly also transferred to distressed targets.

3 Development of Hypotheses

When a firm faces distress, it might hold insufficient funds to meet its debt obligations and have credit constraints there make it hard for the firm to raise additional capital. To overcome the financial distress, the firm has two choices either it can renegotiate the contracts with the debt holders or sell its assets to meet its obligation to repay the debt holders. In perfect capital markets without financial frictions the firm can sell the assets at the fair market value and renegotiate with the debt holders, so the financial distress will be costless.

In a real world, with financial frictions, the story might be different. Studies have shown that due to information asymmetry, debt renegotiations with the creditors often fails (Brown, 1989). When the firm cannot renegotiate the terms of the debt it might be forced to sell its assets to prevent going bankrupt. Such sales of assets give liquidation cost which depends on the liquidity of the market. To test if acquirers experience abnormal returns when acquiring distressed assets, due to fire-sales discounts, the first hypothesis is formed:

H_1*: Distressed targets are acquired at a higher discount.*

The liquidity of the market is as mentioned earlier in section 2.6 a determinant for liquidation costs. The liquidity of the market depends on several factors, such as asset specificity and credit constraints of comparable firms. One implication of Shleifer & Vishny's (1992) model is that when a firm is facing distress, the peers in the industry are likely to have problems themselves. This leads to the assets are sold below their fair market value. Such illiquidity makes assets cheap in bad times (Shleifer & Vishny, 1992). This leads to the next hypothesis:

H_2: *Distressed targets are acquired at a higher discount when their industry is distressed.*

Considering Shleifer & Vishny's (1992) theory, described in section 2.6.2, one would expect that distressed firms are acquired from industry outsiders, which leads to the third hypothesis:

H_3: *Distressed targets in distressed industries are more likely to be acquired by outsiders.*

The fourth hypothesis originates from the third hypothesis. Williamson (1988) stresses the link between asset redeployability and asset value. If the assets have alternative uses one would expect it to be sold at a higher value. Unfortunately, many assets are not redeployable due to asset specialization. This is also one implication of Shleifer & Vishny's (1992) model namely that the assets are not necessary being allocated to the highest value user. So, one would expect that when assets are sold to an industry insider it would be sold with less fire-sales discount compared to an industry outsider. This leads to the next hypothesis:

H_4: *Distressed targets in distressed industries are acquired by a higher discount when it is bought of an industry insider compared to an industry outsider*.

The next hypothesis is also considering the targets industry. It is based on the thoughts of perfect competition theory, which states that an industry with high competition will lead to no acquirer surplus. This can be transferred to distressed acquisitions (Bruton et al., 1994). One can argue that a market with many potential bidders will drive up the target premium to its market equilibrium. This means that bidders will continue to bid on the target until the gap between the premiums is equal or higher than the total synergy that can be achieved. A reason to that can be the winners curse phenomenon because of the managerial hubris as described earlier in section 2.1.2.1 (Thaler, 1988).

One would expect competition to be even more important when considering distressed firms. These firms are in an urgent need to sell their assets. One of the implications of Shleifer & Vishny's (1992) theory is that the peers within the industry have the best use of the assets and therefore will have the highest valuation. One would expect that higher implicit competition i.e. more buyers within the industry. Would result in less fire-sale discount. The hypothesis is developed based on Meier & Servaes (2015) hypothesis.

However, the hypothesis in this paper take a slight different approach, there to the writers' best knowledge have not been examined before. Namely if the implicit competition in the industry grow in importance if the industry faces distress. This leads to the following hypothesis:

H_5: *Distressed targets in a distressed industry with low implicit competition are acquired by a higher discount.*

The next hypothesis is investigating the redeployability of the targets asset further. The hypothesis will examine if a targets asset specificity is deterministic for the discount of the distressed target, which is a determinant of liquidity according to Schleifer & Vishny (1992). It is common in a distressed setting, that the firm is financial constrained and forced to deploy its asset to survive (Kim, 2018). The reason for the discount can be the constrained utility of the assets, which the buyer has to be compensated for. Williamson (1988) explored such link between debt capacity and the liquidation value of assets. This means that redeployability has a substantial impact on the fire-sales discount. Kim (2018) examines the impact of asset specificity from the viewpoint of the target. This paper will examine the impact of asset specificity on fire-sales discount from the viewpoint of the acquirer. This is the basis for the next hypothesis.

H_6: *Distressed targets in a distressed industry with high asset specificity are acquired by a higher discount.*

After investigating, the asset redeployability's impact on acquisition outcomes the next hypothesis will consider the targets access to alternate sources of funding. The hypothesis is developed from Officer's (2007) paper and is investigating if privately held distressed firms are acquired with a larger discount than public traded distressed are. The rationale is that public traded companies have easier access to the equity market, which expand their financing possibilities. A privately held company is more constraint in that sense because it only has access to the debt market (Officer, 2007). This leads to the following hypothesis:

H_7: *Distressed targets there is unlisted are acquired at a higher discount than distressed targets there are listed.*

The next hypothesis is examining if there is a difference between unlisted- or listed targets acquired in stressed market settings. The access of liquidity is a crucial factor for overcoming financial distress. Therefore, the limitations on capital is advantageous for the acquirer, which should ceteris paribus put the unlisted target in an inferior position of negotiation (Officer, 2007). A reason for a lower bargain power stems also from the difficulties of getting rid of non-traded shares compared to highly liquid shares, which can be sold in the market (Officer, 2007). While Officer (2007) only examines the difference between unlisted- and listed targets. This paper will examine when the unlisted target faces financial distress, as one would expect the debt- and equity market conditions would have an even higher effect when the target has an urgent need for capital. This is a hypothesis there have not been examined in existing literature to the study's best knowledge. This leads to the following hypothesis.

H_8: *Distressed unlisted targets sell at a higher discount when the conditions on the debt- and equity markets makes alternative sources of liquidity more difficult and costly to obtain.*

The next hypothesis is covering the general market conditions, namely if economic or financial downturns have an impact on the targets premium (Carapeto et al., 2009). One can argue that accessibility of credit is limited in market crisis's rather than in good times (Ang & Mauck, 2011). This means that a distressed targets bargain power is sufficient lowered and are therefore being acquired with a larger discount.

H_9: *Distressed targets are acquired at a higher discount in distressed times.*

The last two hypotheses are considering acquirer characteristics, which can have an impact on their wealth transfer because these characteristics is expected to be deterministic of a successful turnaround.

Integration of assets in the acquirer firm can be a costly and difficult process and the difficulty does not decline when looking on distressed assets (Bruton et al., 1994). Therefore, prior acquisition experience might give the

acquirer some skills to better integrate the targets assets (Fowler & Schmidt, 1989). This is why one would expect that the acquirer performance would be better when the acquirer is more experienced. The next hypothesis will be developed with inspiration from Bruton et al. (1994), which leads to the next hypothesis:

H_{10}: *Distressed targets acquired by an experienced firm are associated with higher wealth transfer to the acquirer.*

When firms face distress, they need additional resources to make the turnaround successful. It could potentially be cash or borrowing capacity from the acquirer to meet its obligation to repay the debt. One would expect that larger firms have more slack resources to help the target firm (Bruton et al., 1994). This leads to the last hypothesis:

H_{11}: *Distressed targets acquired by a relatively larger firm are associated with higher wealth transfer to the acquirer*

4 Methodology

This chapter will first explain how short-term performance of the acquirers is measured. Afterwards there will be a discussion about how long-term performance is measured. Next, different proxies of distress is described. Afterwards a section about control variables is carried out. At last, the methodological design for all hypotheses and the statistical tests used to test the hypotheses is described.

4.1 Short-term performance

The study will first discuss, which approach that are most suited for the investigation of the acquirer performance on the short-term.

4.1.2 Choice of returns

In this paper daily returns are used to estimate normal- and abnormal returns when examining the short-term performance of the acquirer. The daily returns are chosen because it is expected that there will be an effect in the days around the announcement of the acquisition. By using daily returns, it is possible to have a narrower event window. This decreases the likelihood that other events will influence the returns and create noise. Using a narrower event window will eliminate this bias and give a more powerful test (Holthausen & Leftwich, 1986). A weakness associated with the use of daily returns is that they depart more from their normality than monthly returns. The daily returns have a more fat-tailed distribution. This means that there tends to be more extreme observations when using daily data (Brown & Warner, 1980). To increase the robustness of the results monthly returns could have been applied as an alternative. Monthly returns smooth out the extreme observations why it gives more robust results. However, it would not be possible to capture the effect around the announcement date. The daily returns are therefore more favorable than monthly returns and will be chosen when examining the short-term effect of acquisitions of distressed targets.

4.1.3 Event window

To analyze the performance of the acquirer the event window needs to be defined. A common event window is [-1,1] around the announcement date. This window has also been used by Oh (2014) and Ang & Mauck (2011), who is examining distressed target acquisitions. This measure will also be used when studying the short-term performance of the acquirer. Other studies like Bradley et al. (1988) have used a longer event window because of uncertainty about the announcement dates. In this study there is announcement dates on all deals, and there have not been something indicating that these should not be reliable. Therefore, a shorter event window like Oh (2014) and Ang & Mauck (2011) have been chosen.

4.1.4 Models for measuring normal short-term performance

In order to evaluate the gains, the acquirer is achieving on the short-term, an estimation of the return have to be made. There are two common approaches when estimating normal returns; statistical- and economic models. These two approaches will be examined in the following section.

4.1.4.1 Statistical models for normal returns

4.1.4.1.1 Constant mean return model

The constant mean return model builds on the assumption that the mean return is constant over time for a given security. The return in given by the following formula (MacKinlay, 1997):

$$R_{it} = \mu_j + \epsilon_{it}$$

$$E(\epsilon_{it}) = 0 \qquad Var(\epsilon_{jt}) = \sigma^2_{\epsilon_{it}}$$

Where R_{it} is the return of security, *i,* in the period *t*. μ_i is the mean return of security, *i,* and ϵ_{it} is the error term. The weakness of the model is that it does not capture the variance of the abnormal returns. However, even though it is a relatively simple model and has some weaknesses Brown & Warner (1980) finds that it is often yielding similar results compared to models that are more sophisticated. These models will be described later in section 4.1.4.2.

4.1.4.1.2 Market model

The market model builds on the assumption that the return of a single security has a linear relationship with the market return. This model is one of the most common used in event studies. The normal return is given by:

$$R_{it} = \alpha_i + \beta_i * R_{mt} + \epsilon_{it}$$

$$E(\epsilon_{it} = 0) \qquad Var(\epsilon_{it}) = \sigma^2_{\epsilon_i}$$

Where R_{it} and R_{mt} is the return in period *t* for security, *i,* and the market portfolio, respectively. α_i, β_{it} *and* $\sigma_{\epsilon_i}^2$ is the parameters estimated by the market model where ϵ_{it} is the zero mean disturbance term (MacKinlay, 1997). The market model is potentially an improvement from the constant mean return model. The reason is that the variation of the returns that relates to the market movements are removed. This reduces the variance of the abnormal returns (MacKinlay, 1997).

4.1.4.2 Economic models

Some of the most used economic models in event studies are the Capital Asset Pricing Model (CAPM) and Arbitrage Pricing Theory (APT). CAPM was earlier a common used model to estimate normal returns in event studies. However, after the APT started to gain ground the use of CAPM declined due to the relatively low costs of implementing APT. Even though the APT has more explanatory factors, they add relatively little explanatory power (MacKinlay, 1997). The CAPM introduces some potential biases. These biases originate from the restrictions that CAPM imposes on the market model. The validity of these restrictions is questionable. By introducing APT the biases of CAPM can be eliminated. The statistical models described above does also eliminate these biases. Because of that they tend to dominate event studies. The reason is that APT is complicated and less convenient to use compared to the market model (MacKinlay, 1997).

4.1.5. Choice of model

As seen in section 4.1.4 there is many approaches when it comes to estimating normal returns. According to Brown & Warner (1980) it does not enhance robustness of the event study by applying more complicated models. Their results show that the market model seems to perform well, when simulating different event study methodologies. They also find that using more complicated economic models increase the risk of type one errors where the null hypothesis is rejected when it is true. In recent literature, that is considering mergers and acquisitions, the market model is a common way of estimating normal returns (Ang & Mauck, 2011; Kim, 2018). Due to the convenience and lack of advantages by using a more complicated model the market model will be used in this paper. To estimate the normal return of acquirer, *j,* in period *t* the following model will be used:

$$R_{jt} = \alpha_j + \beta_j * R_{mt} + \epsilon_{jt}$$

The parameters of the model will be estimated with an Ordinary Least Square (OLS) regression and will be specified and discussed in the next section. When using the market model, a representative index of the market return is needed. A Commonly used measure is the S&P 500, CRSP value-weighted index and CRSP equally weighted index (MacKinlay, 1997). However, this paper is delimited to focus on the European market and using some of these indexes will not be a properly approximation of the market return. Brown & Warner (1980) finds that using a value-weighted index increases the risk of type one errors. This is why an equally weighted index is preferable in event studies. A suited index for the study is the STOXX ® Europe 600 equally weighted index. The index contains companies of different magnitudes and a broad range of different countries. Due to these reasons the index servers as a good proxy for the market return in Europe.

4.1.5.1 Estimation window of the market model

When choosing an estimation window, to estimate normal returns, it is important that the event is not included in the window. If there is an overlap between the estimation- and event window the estimated normal returns will be biased of the event. Following Bradley et al. (1988) and Oh (2014) an estimation window, to estimate market model parameters, running from [-300,-60] trading days prior to the event will be applied. By excluding 60 trading days prior to the announcement the event is with almost certainly not included. The estimation of the parameters to the market model will therefore not be biased. Furthermore, 240 trading days of daily returns will give a sufficient amount of data to estimate the parameters.

4.1.6 Abnormal returns

The estimates of the acquirers' wealth gains are based on the prediction errors of the market model. The abnormal return is the difference between the actual return and the expected return predicted by the market model. It is a direct measure of the unexpected change in acquirers' wealth associated with the event. The abnormal return for every day in the event windows is calculated as:

$$AR_{jt} = R_{jt} - \hat{\alpha}_j - \hat{\beta}_{jt} * R_{mt}$$

Where

AR_{jt} is the abnormal return to acquirer *j* on day *t.*

R_{jt} is the actual return to acquirer *j* on day *t.*

$\hat{\alpha}_j$ is the intercept estimated using the market model.

$\hat{\beta}_{jt}$ is the systematic risk component estimated using the market model.

R_{mt} is the return to equally weighted STOXX® Europe 600 market portfolio in day *t.*

Under the null hypothesis, which states that the abnormal returns equal zero, the abnormal returns will be jointly normally distributed with a conditional mean and a conditional variance (MacKinlay, 1997):

$$AR_{jt} \sim N\left(0, \sigma^2\left(AR_{jt}\right)\right)$$

Where the conditional variance is:

$$\sigma^2(AR_{jt}) = \sigma_{\epsilon_j}^2 + \frac{1}{L_1} * \left[1 + \frac{(R_{mt} - \hat{\mu}_m)^2}{\hat{\sigma}_m^2}\right]$$

L_1 is the length of the estimation window and $\hat{\mu}_m$ and $\hat{\sigma}_m^2$ is the market mean and variance from the sample. When L_1 becomes large the second term of the variance approaches zero because the sampling error of the parameters disappear (MacKinlay, 1997). The estimation window used in this paper, as described in section 4.1.5.1, is chosen by following the approach of previous literature in peer-reviewed journals. Because of that it is assumed that the estimation window is of an appropriate length, why the sampling error will disappear.

4.1.6 Cumulative Abnormal returns

In order to draw the overall inferences for the event the abnormal returns must be accumulated. The cumulative abnormal return for acquirer, *j,* is the sum of the abnormal return in the given event window, τ. $CAR(\tau_1, \tau_2)$ is defined as the samples cumulative abnormal return (CAR) from period τ_1 to τ_2 (MacKinlay, 1997):

$$CAR_j(\tau_1, \tau_2) = \sum_{\tau=\tau_1}^{\tau_2} AR_{j\tau}$$

Where the variance is given by:

$$\sigma_j^2(\tau_1, \tau_2) = (\tau_2 - \tau_1 + 1) * \sigma_{\epsilon_j}^2$$

The distribution of CAR under the null hypothesis is:

$$CAR_j(\tau_1, \tau_2) \sim N\left(0, \sigma_j^2(\tau_1, \tau_2)\right)$$

CAR will be measuring the performance of the acquirer on the short-term through this paper.

4.2 Long-term performance

While there is consensus among researchers about that CAR is the best measure for short-term performance, there is several approaches to measure long-term performance. The two most common measures are CAR and buy-and-hold abnormal returns (BHAR). While CAR in early finance studies was the preferred measure of long-term performance there have later been raised some problems about using CAR. Barber & Lyon (1997) shows that CARs are biased predictors of BHARs. Furthermore, they document that in four percent of all sampling situations researchers would draw different conclusions depending on which of the measures there is used. Another problem with using CAR is that, even if the inference based on CAR is correct, the magnitude is still wrong and in most cases upward biased, which results in too high estimates. Due to the potential biases, the

paper will therefore use BHAR as a measure of long-term performance. This performance measure is chosen because it reduces noise from potential overlapping events. Whether the BHAR method gives us the correct abnormal return is not critical. The focus in this paper is to examine the acquirers' performance when buying distressed targets relatively to the acquisition of non-distressed targets. Furthermore, when taking the difference of the two returns, it will be corrected for estimation biases which both are in same direction (Ang & Mauck, 2011). This is also a common measure in the literature when examining the long-term performance of acquisitions (e.g. Ang & Mauck, 2011; Oh, 2014). The long-term returns will be estimated as follows:

$$BHAR_{j_{(t,T)}} = \prod_{t=1}^{T}(1 + r_{j_t}) - \prod_{j=1}^{T}(1 + r_{mkt_t})$$

Where r_{j_t} is the return to acquirer, *j,* in month *t and* r_{mkt_t} is the market return in month *t.* T is defined as the holding period for acquirer, *j.* The intuition behind BHAR is that one will have to subtract the product of the expected return, in this case defined as the market return, from the product of the return of acquirer, *j*. It is different how researchers define the expected return. Some uses matching firms to eliminate new issues, rebalancing and skewness biases, which is associated with using a benchmark. However, this study focuses on all European countries, while the papers using matching firms only consider one market. Due to capacity constraints a benchmark is used as in both Ang & Mauck (2011) and Barber & Lyon (1997) to estimate the expected return. As a proxy for the market return STOXX ® Europe 600 equally weighted index will be used. This study is considering all European countries why the STOXX ® Europe 600 index serves as a good proxy because it covers different firm sizes and 17 countries in Europe.

4.2.1 Long term event window

The most literature there is examining the performance of mergers on long-term are using a two to five years event window (e.g Ang & Mauck, 2011; Loughran & Vijh, 1997; Oh, 2014). Even though an event window of that length would be optimal it is not possible due to data constraints. Some of the variables used to test the hypothesis consist of very few observations, which is immediate weakness. Because of that, the window in this study has to be shorter. Following Bradley et al's. (1988) approach the event window for long-term performance will be four month post-acquisition. One could argue that four months is a too short time frame when investigating the acquirers' ability to exploit synergies and to see the full effect of the acquisition. However, a shorter time frame is necessary in this study because it is not possible to collect data before 2008.

4.3 Measures of distress

One of the key elements of this study is to distinguish between distressed and non-distressed firms. There is no direct way to measure distress. However, there are several proxies in the literature. In this section, some of the most common measures will be discussed. The proxies will be used later on in the analyses when the paper has to distinguish between distressed firms and non-distressed firms. This section will both continue measures of firm-level and industry-level distress.

4.3.1 Firm-level distress

There have been used several measures for financial distress in previous literature. This section describes some of the most common measures. There are two main categories of distress measures. One that solely considers balance sheet- and income statement numbers and one category with methods there estimates the likelihood of bankruptcy. First, the different measures within the category with solely accounting numbers is examined.

One of the most common used measures is negative net income (e.g., Ang & Mauck, 2011; Bhaghat et al., 2005; John et al., 1992; Li, 2010). However, Oh (2014) argues that negative net income is a poor measure of distress due to cross-industry variation of net income levels. A large amount of high-tech companies has negative net income and this does not necessarily mean that the high-tech companies are distressed.

Another measure used in the literature to measure distress is the spare debt capacity. A firm is considered distressed if the current ratio is below the industry median and the leverage ratio is above the industry median. If both these conditions are satisfied the firm has low spare debt capacity. This implies that it can be considered distressed (e.g., Oh, 2014; Pulvino, 1998).

Furthermore, the interest coverage ratio can be used to measure firm-level distress. A target can be considered distressed if the firms interest coverage ratio is below the median interest coverage ratio in the industry (e.g., Almeida et al., 2011; Andrade & Kaplan, 1998; Asquith et al., 1994)

Another approach to measure distress is through models that predicts the likelihood of a firm going bankrupt, which output can be used as a continuous measure of distress. One of the best known and commonly used models is the Z-score developed by Altman (1968). This model is developed to predict bankruptcy. Where a higher score gives a larger probability of bankruptcy and all else equal the firm is facing a higher degree of financial distress. The model is developed from some of the indirect costs of distress namely declining sales

growth and decline in sales. Altman's (1968) Z-score is used as a proxy for firm-level distress in several studies investigating fire-sale effects (e.g., Ang & Mauck, 2011; Kim, 2018).

Another model which estimate the likelihood of bankruptcy, Ohlson's O-score, developed by Ohlson (1980). As in the case with Altman's Z-score, the higher O-score the more likely the firm is to go bankrupt and must face a higher degree of financial distress. Ohlson's (1980) is also used as a measure of distress in previous literature (e.g., Ang & Mauck, 2011; Griffin & Lemmon, 2002)

At last the KMV-Merton model which estimate the distance to default is also a widely used measure for firm-level distress in the literature. The model is based on Merton's (1974) original bond pricing model. The model calculates the probability, that the value of the firm will be less than the face value of debt, in a given point in time. The distance to defaults output is how many standard deviations the firm is from defaulting. This is a widely used measure for distress in the literature (e.g., Chava & Purnanandam, 2010; Oh, 2014; Vassalou & Xing, 2004).

The paper investigates both unlisted and listed targets. Because of that only the proxies for distress based on accounting numbers can be applied. The paper will use negative net income and the debt capacity as measures of distress. The reason for this is that there is limited data on the interest payments of the firms.

4.3.2 Industry-level distress

As described in section 2.5 financial distress is connected with many indirect costs. Many of these costs will result in declining sales. Also, one of the things Altman's (1968) Z-score is based on is declining sales growth. Using declining sales as a proxy for industry-level distress is in general a measure there have gained attention in the literature. A widely used measure is, that an industry faces financial distress, when the median sales growth is negative (e.g. Acharya et al., 2007; Gopolan & Xie, 2011; Oh, 2014; Opler & Titman, 1994). Another measure used by Acharya et al. (2007) is that, when the average credit rating of the firms in the industry is below investment grade, then the industry is classified as distressed. Finally, some studies also classify an industry as distressed if the median stock return is below -30 percent (Acharya et al., 2007; Gopolan & Xie, 2011; Opler & Titman, 1994).

The proxy for industry distress based on median negative sales growth will be used in this paper. The reason for this is that Copenhagen business school does not offer access to credit rating databases. Furthermore, the median stock return of -30 percent requires a lot of capacity and have not shown to give superior results in prior. Because of that median negative sales growth in the industry will be used as a proxy for industry distress as it is also the most common proxy in studies considering acquisition of distressed targets.

4.4 Control variables

In order for the results to hold in a multivariate setting, there is included control variables. The idea behind these control variables is to control for effects, there is outside the scope of this paper, which could drive the results. The control variables can be divided into two groups. First, firm characteristics of both the target and acquirer. Second, characteristics of the deal. Besides these characteristics there is also controlled for fixed-effects.

4.4.1 Firm characteristics

The paper is only considering acquirers that are listed. This make it possible to find data on the most desirable control variables. However, the targets used in this paper are both unlisted and listed so control variables, which requires stock data, cannot be used. A way to overcome this is to first test if the control variables had an effect on the results of the listed targets. However, the sample of listed targets are very small. This makes the results hard to generalize to the unlisted. Because of that, these control variables are excluded on the targets.

One firm characteristics there is highlighted in the literature as influencing the acquisition outcome, and therefore the abnormal return of the acquirers', is the management quality. Lang et al. (1989) uses Tobin's Q as a proxy for management performance. They find that an acquirer with a high Q gains abnormal returns. A high Q means that the acquirer has a good management. This result is even more significant if a well-managed (high Q) acquirer buys a poorly managed (low Q) target. Therefore, the results must be controlled for Tobins Q otherwise significant results can be a result of management performance rather than the chosen proxy for the hypothesis. Tobin's Q is calculated as market value of assets to book value of assets. Since, the calculations of Tobins Q require stock market data there is only controlled for acquirer Q.

Another firm characteristic is market to book ratio. Market to book ratio is a measure of the future growth opportunities. High market to book ratio acquirers tends to acquirer low market to book ratio targets (Rhodes-Kropf et al., 2004). Acquirers with high book to market value tends to be overvalued and tends to underperform firms with low book to market ratio in acquisitions (Rau & Vermaelen, 1998). Again, there is controlled for acquirer market to book ratio but not for the targets since it is not possible without market data. The market to book ratio is calculated as market value of equity to book value of equity.

Furthermore, there is used a control variable to control for the tangibility of the firms assets. Tangible assets tend to be less redeployable. Less redeployable assets are sold at a discount this means it has a positive impact on performance of the acquirer (Kim, 2018). Even though one of the hypothesis in this paper is to test how asset specificity influence the price discount it still makes sense to include this variable. The main interest in that

hypothesis is to test the effect of asset specificity on acquirer returns rather than the effect from the size of the tangible assets. Tangibility is calculated as tangible assets to total assets (Kim, 2018).

At last there is controlled for leverage. Leverage affects firms cost of capital. A higher cost of capital results in a lower gain on the acquisition than an identical firm with lower cost of capital. Because of that leverage is linked with negative performance of the acquisition (Rhodes-Kropf et al., 2004). There is used control variables for both the target and acquirer. The leverage ratio is calculated as total debt to book value of assets. This is also an effect there is widely controlled for in previous literature (Kim, 2018; Meier & Servaes, 2015; Oh, 2014).

One control variable there is left out due to data limitations is for profitability. Orbis does have limited data on the decomposed income statement posts. Because of that, it has not been possible to construct a profitability measure.

4.4.2 Deal characteristics

It is also important to control for potential deal characteristics that could drive the results. One important note is that the deal database used in the paper has more limited data than the US databases. This is an immediate weakness of the paper since it is not possible to control for all known effects there has an impact on the results.

Previous literature highlights that stock financed mergers are more likely to happen when the market in general are overvalued (Rhodes-Kropf & Viswanathan, 2004; Shleifer & Vishny, 2003). This might give incentives to finance a merger with overvalued stocks. This will have a negative effect on the performance (Ghosh, 2001). Thus, the results must be controlled for the method of payment. Otherwise significant results can be an outcome of method of finance rather than the chosen proxy for the hypothesis. Therefore, there is controlled for all stock payments and all cash payments as in prior literature there is concerning acquisition of distressed targets (Kim, 2018; Meier & Servaes, 2015; Oh, 2014).

Another known effect is Toehold. If the acquirer owns an initial stake, a so-called toehold, it has the effect that it can limits the competition and therefore the target might be sold at a lower premium (Bulow et al., 1999). If the target is sold at a lower premium it has a positive influence on performance of the acquirer (Betton & Eckbo, 2000; Choi, 1991). A control variable for this known effect will be implemented.

There are several control variables were data was not available. Some of the control variables this study cannot manage to control for is *Tender offers, competed deals, hostile takeovers and poison pills*. These control variables have been used in previous similar studies (Ang & Mauck, 2011; Kim, 2018; Meier & Servaes, 2015; Oh, 2014).

These effects could have been desirable to remove and it is important to keep in mind, that these effects can potentially bias the results.

4.4.1 Fixed-effects

The analyses in this paper is based on panel data. When using panel data, it is important to adjust for aggregate trends, which are irrelevant for the causal relationship. These aggregate trends can influence the results. To remove these effects there is controlled for year fixed-effects.

In the previous section there have been made control variables for firm characteristics there might influence the results. However, there might be some unobservable industry characteristics there is correlated with the acquirer return. In order to capture these hidden characteristics there will be controlled for both acquirer and target industry fixed-effects. A common way of defining the industry in the literature is by using the first 3-digit SIC code. This definition will also be applied in this paper.

4.5 Methodology hypothesis

4.5.1 Methodological design first hypothesis

The purpose of the first test is to examine the effect of targets firm-level distress to acquirers' return. The acquirers' abnormal return is compared between deals where a distressed target or a non-distressed target is acquired. First, the short-term return, CAR_{ijdt}, is estimated as described in section 4.1.6 and second, the long-run return, $BHAR_{ijdt}$, is estimated as described in section 4.2.

$$CAR_{ijdt} = \beta_1 * Distress_{it} + \gamma * X_{ijd} + \alpha_t + \alpha_i + \epsilon_{ijdt}$$

$$BHAR_{ijdt} = \beta_1 * Distress_{it} + \gamma * X_{ijd} + \alpha_t + \alpha_i + \epsilon_{ijdt}$$

Where $Distress_{it}$ are the firm-level distress measure of target *i,* and X_{ijd} represents the control variables, as presented in section 4.4, for target *i,* acquirer *j,* and deal characteristics *d.* Furthermore, there is controlled for year fixed effect, α_t, and industry fixed effect, α_i.

As described in section 4.3.1 two measures of distress will be applied in this study. $Distress1_t$ is the distress measure adapted from Pulvino (1998). It is a dummy variable, which take the value one if the current ratio is below the industry median and the leverage ratio is above the industry median. The second measure of distress, $Distress2_t$, is also a dummy variable, which takes the value one if the target has negative net income in the year prior to the acquisition. As described in section 2.5, financial distress is associated with liquidation costs. These

liquidation costs occur when the target suddenly has to liquidate its assets to repay the debt holders. Due to these liquidation costs a significant positive coefficient of β_1 is expected.

4.5.2 Methodological design second hypothesis

The second hypothesis is testing the null hypothesis, which states that distressed targets are acquired with no discount when the industry is also distressed. One of the implications of Shleifer & Vishny (1992) is that their model predicts that in order for a fire-sale to occur both the industry and the firm is distressed. As mentioned in section 2.6 when a fire-sale occur the target is being sold below its fundamental value, and one would expect the acquirer to gain a significant CAR. The alternative hypothesis is therefore testing if the acquirer is gaining after acquirering a distressed target in a distressed industry. The hypothesis will be tested on a short, CAR_{ijdt}, and on a long run, $BHAR_{ijdt}$ and the methodology from Oh (2014) will be applied:

$$CAR_{ijdt} = \beta_1 * Firesale_{it} + \beta_2 * \ Distress_{it} + \beta_3 * IndustryD_{it} + \ \gamma * X_{ijd} + \alpha_t + \alpha_i + \epsilon_{ijdt}$$

$$BHAR_{ijdt} = \beta_1 * Firesale_{it} + \beta_2 * \ Distress_{it} + \beta_3 * IndustryD_{it} + \ \gamma * X_{ijd} + \alpha_t + \alpha_i + \epsilon_{ijdt}$$

$Distress_{it}$ is a dummy variable measuring if the firm is distressed or not. If the firm is distressed the variable will take the value one. $IndustryD_{it}$, is a dummy variable measuring if the whole industry is also under distress. This variable will take the value one if the industry is distressed. Whereas, if both happens to be distressed a fire-sale will occur, $Firesale_{it}$, is the interaction term between firm- and industry-level distress and will take the value one if both the industry and the target is distressed. X_{ijd} is representing the control variables for target *i,* acquirer *j,* and deal characteristics *d.* Furthermore, there is controlled for year fixed effect, α_t, and industry fixed effect, α_i. β_1 is the coefficient, which is determining the fire-sale discount why one would expect a positive coefficient. This means that the acquirer is expected to earn a higher abnormal return than in regular acquisitions.

4.5.3 Methodological design third hypothesis

So far, hypothesis one and two has examined what implications firm- and industry-level distress has on the fire-sales discount of the targets. This hypothesis investigates how firm- and industry distress influence the identity of the acquirer. The null hypothesis is that firm- and industry-level distress has no significant impact on the acquirer identity. The alternative hypothesis states that the industry peers are financially constrained so the target are likely to be acquired by an industry outsider. This is also one of the implications of Shleifer & Vishny's (1992) model described in section 2.6.2. To test the hypothesis the methodology from (Oh, 2014) is applied. Why a probit model is used to estimate the probability for a target is acquired of an industry outsider:

$$Prob(Out_{ijdt}) = \beta_1 * Firesale_{it} + \beta_2 * \ Distress_{it} + \beta_3 * IndustryD_{it} + \ \gamma * X_{ijd} + \alpha_t + \alpha_i + \epsilon_{ijdt}$$

For an acquirer to be considered as an industry outsider they need to have a different 3-digit SIC code than the target. Out_{ijdt} is a dummy variable there takes the value one if acquirer has another 3-digit SIC code than the target. Again, $Distress_{it}$ is the measure of firm-level distress and $IndustryD_{it}$ is the industry-level distress. X_{ijd} represents the control variables, as presented in section 4.4, for target *i,* acquirer *j,* and deal characteristics *d.* Furthermore, there is controlled for year fixed effect, α_t, and industry fixed effect, α_i. The study expects the coefficient β_1 to be significantly positive because the theory of Shleifer & Vishny (1992) suggests that firm- and industry-level distress have an impact on the acquirers identity.

4.5.4 Methodological design fourth hypothesis

After examining if firm- and industry-level distress has a significant impact on the acquirer identity it is relevant to test how the acquirer identity influence the acquirers' abnormal return. The null hypothesis states that the acquirer identity has no significant impact on the price discount. However, as described in section 2.6 Shleifer & Vishny (1992) both the firm and the industry faces distress the target is not always sold to the highest value user. The alternative hypothesis is therefore that the fire-sales effect should be stronger if the targets are sold to acquirers outside the targets industry. The hypothesis will be tested on a short, CAR_{ijdt}, and on a long run, $BHAR_{ijdt}$.

$$CAR_{ijdt} = \beta_1 * (Out_{ijt} * \ Distress_{it} * IndustryD_{it}) + \beta_2 * Out_{ijt} + \beta_3 * \ Distress_{it} + \beta_4 * IndustryD_{it} + \ \gamma * X_{ijd} + \alpha_t + \alpha_i + \epsilon_{ijdt}$$

$$BHAR_{ijdt} = \beta_1 * (Out_{ijt} * \ Distress_{it} * IndustryD_{it}) + \beta_2 * Out_{ijt} + \beta_3 * \ Distress_{it} + \beta_4 * IndustryD_{it} + \ \gamma * X_{ijd} + \alpha_t + \alpha_i + \epsilon_{ijdt}$$

The triple interaction element contains three dummy variables. Out_{ijt} takes the value one if acquirer *j,* has a different 3-digit SIC code than target *i*. $Distress_{it}$ and $IndustryD_{it}$ is dummy variables there takes the value one if the firm or industry is distressed, respectively. X_{ijd} represents the control variables, as presented in section 4.4, for target *i,* acquirer *j,* and deal characteristics *d.* Furthermore, there is controlled for year fixed effect, α_t, and industry fixed effect, α_i. If the fire-sales discount is largely driven by the acquirer identity it is expected that β_1 is significantly positive. As this would imply that the fire-sale discount would be driven of fire-sales acquisitions with industry outsiders.

4.5.5 Methodological design fifth hypothesis

The fifth hypothesis is testing the following null hypothesis, that implicit competition is not affecting the fire-sale discount. The alternative hypothesis is testing whether low implicit competition and fire-sale is contributing to that the acquirer is earning a positive CAR. The argument is that high implicit competition will result in lower abnormal returns for the acquirer because there will be more buyers with a higher fundamental valuation.

$$CAR_{ijdt} = \beta_1 * (Firesale_{it} * Competition_{it}) + \beta_2 * Firesale_{it} + \beta_3 * Competition_{it} + \beta_4 * \ Distress_{it} + \beta_5 * IndustryD_{it} + \ \gamma * X_{ijd} + \alpha_t + \alpha_i + \epsilon_{ijdt}$$

$$BHAR_{ijdt} = \beta_1 * (Firesale_{it} * Competition_{it}) + \beta_2 * Firesale_{it} + \beta_3 * Competition_{it} + \beta_4 * \ Distress_{it} + \beta_5 * IndustryD_{it} + \ \gamma * X_{ijd} + \alpha_t + \alpha_i + \epsilon_{ijdt}$$

The acquirers cumulative abnormal return will be tested on a short- and on a long run. $Distress_{it}$ is measuring if the firm is distressed or not. If the firm is distressed the dummy variable will take the value one. $IndustryD_{it}$, is measuring if the whole industry is also under distress. This dummy variable will take the value one if the industry is distressed. Whereas, if both happens to be distressed a fire-sale will occur, $Firesale_{it}$, and will take the value one if both prior variables are taking the value one. $Competition_{it}$ is a continuous measure that are counting the volume of potential competitors. $X_{ijd}$is representing the control variables for target *i,* acquirer *j,* and deal characteristics *d.* Furthermore, there is controlled for year fixed effect, α_t, and industry fixed effect, α_i. β_1 is measuring the combined effect of $Firesale_{it}$ and $Competition_{it}$ on the performance measure. It is expected that the coefficient on the interaction term β_1 will be significant negative. The rationale behind this is that high competition will result in a lower gain for the acquirer because the gain will be competed away. If fire-sale discount is largely driven by implicit competition the coefficients β_2, β_3 and β_4 is expected to be insignificant. However, if the interaction term does not capture the full effect on acquirer returns β_2, which is determining the fire-sale discount, is then expected to be positive. β_3 is the coefficient of the competition measure and is supposed to be negative in order to support the alternative hypothesis. β_4 is the coefficient that is measuring the effect of distress.

4.5.6 Methodological design sixth hypothesis

The sixth null hypothesis is testing that asset specificity does not influence the price discount. One of the implications stated by both Williamson (1988) and Shleifer & Vishny (1992) is that asset redeployability theoretically should have an impact on the price the targets receive for their assets. The rationale is that if the assets are redeployable, then they will be sold closer to their fundamental value because they have alternative uses. Targets with less specific assets tends to have more alternative uses. This leads to the alternative hypothesis that asset specificity significant increases the acquirers' abnormal returns. The hypothesis will be tested on a short, CAR_{ijdt}, and on a long run, $BHAR_{ijdt}$.

$$CAR_{ijdt} = \beta_1 * (Firesale_{it} * AssetSpecificity_{it}) + \beta_2 * Firesale_{it} + \beta_3 * AssetSpecificity_{it} + \beta_4 * Distress_{it} + \beta_5 * IndustryD_{it} + \gamma * X_{ijd} + \alpha_t + \alpha_i + \epsilon_{ijdt}$$

$$BHAR_{ijdt} = \beta_1 * (Firesale_{it} * AssetSpecificity_{it}) + \beta_2 * Firesale_{it} + \beta_3 * AssetSpecificity_{it} + \beta_4 * Distress_{it} + \beta_5 * IndustryD_{it} + \gamma * X_{ijd} + \alpha_t + \alpha_i + \epsilon_{ijdt}$$

Where $Assetspecificity_{it}$ is a measure of target *i's* asset specificity. Again, $Distress_{it}$ is the measure of firm-level distress and $IndustryD_{it}$ is the industry-level distress. The combined effect of the distress and industry is make up the $Firesale_{it}$ interaction term. These three measures make up the triple interaction element. X_{ijd} represents the control variables, as presented in section 4.4, for target *i,* acquirer *j,* and deal characteristics *d.* Furthermore, there is controlled for year fixed effect, α_t, and industry fixed effect, α_i. A significant positive sign on $\beta_1$would indicate that asset specificity has an impact of the fire-sales discount of the target firms assets.

4.5.7 Methodological design seventh hypothesis

The seventh hypothesis is testing whether a distressed unlisted target is sold by a discount than a distressed listed target. The rationale is that the relative illiquidity on the private market is playing a role on determining the discount the acquirer is achieving. If such illiquidity premium exist the gain should be transferred to the acquirer.

$$CAR_{ijdt} = \beta_1 * (Distress_{it} * Unlisted_{it}) + \beta_2 * Distress_{it} + \beta_3 * Unlisted_{it} + \gamma * X_{ijd} + \alpha_t + \alpha_i + \epsilon_{ijdt}$$

$$BHAR_{ijdt} = \beta_1 * (Distress_{it} * Unlisted_{it}) + \beta_2 * Distress_{it} + \beta_3 * Unlisted_{it} + \gamma * X_{ijd} + \alpha_t + \alpha_i + \epsilon_{ijdt}$$

The acquirers performance will be tested on a short- and on a long run. $Distress_{it}$ is measuring if the firm is distressed or not. If the firm is distressed the dummy variable will take the value one. $Unlisted_{it}$ is also a dummy

variable, if the target is unlisted it will take the value one. $X_{ijd}$is representing the control variables for target *i,* acquirer *j,* and deal characteristics *d.* Furthermore, there is controlled for year fixed effect, α_t, and industry fixed effect, α_i. β_1 is the coefficient that is measuring the combined effect of both an unlisted and firm-level distress. β_{2-3} is coefficients that are measuring the impact of a firm being $Unlisted$ and $Distress_{it}$. In order to verify the alternative hypothesis, the study expect the β_1 coefficient to be significantly positive.

4.5.8 Methodological design eighth hypothesis

The eight hypothesis investigate if the difficulty and costs associated with alternative sources of funding have an impact on the price discount. The rationale is that poor debt- and equity market conditions weakens the bargain power of the target. This is expected to give a price discount of the target. This leads to the alternative hypothesis that poor debt- and equity market conditions significant increases the fire-sale discount. The hypothesis will be tested on a short, CAR_{ijdt}, and on a long run, $BHAR_{ijdt}$:

$$CAR_{ijdt} = \beta_1 * \left(Unlisted_{it} * Distress_{it} * IPO_{vol_t}\right) + \beta_2 * (Unlisted_{it} * Distress_{it} * Spread_t) + \beta_3 * Unlisted_{it} + \beta_4 * IPO_{vol_t} + \beta_5 * Spread_t + \beta_4 * Distress_{it} + \gamma * X_{ijd} + \alpha_t + \alpha_i + \epsilon_{ijdt}$$

$$BHAR_{ijdt} = \beta_1 * \left(Unlisted_{it} * Distress_{it} * IPO_{vol_t}\right) + \beta_2 * (Unlisted_{it} * Distress_{it} * Spread_t) + \beta_3 * Unlisted_{it} + \beta_4 * IPO_{vol_t} + \beta_5 * Spread_t + \beta_4 * Distress_{it} + \gamma * X_{ijd} + \alpha_t + \alpha_i + \epsilon_{ijdt}$$

The first triple interaction term measures if the equity market conditions have a larger effect on the acquisitions outcome on unlisted distressed targets versus listed distressed targets. The second triple interaction term measures the same just on the debt market conditions. IPO_{vol_t} is a proxy for the equity market conditions and $Spread_t$ is a proxy for the debt market conditions. The other measures are the same as in previous hypotheses.

$\beta_1$and β_2 is the coefficients of specific interest in this hypothesis. For the conditions to have an effect on the fire-sales discounts the coefficients are expected to be significantly positive. If the fire-sale discount is largely driven by the debt- and equity market conditions, then the other coefficients are expected to be insignificant. If it is not the main driver they are all expected to be significant positive.

4.5.9 Methodological design ninth hypothesis

The ninth null hypothesis is trying to verify that general distress on the market i.e. financial and economic crisis do not play a role in determining the discount when the target is distressed. The alternative hypothesis states the opposite that general distress does have an impact on the price discount. If the null hypothesis is rejected the acquirer should be able to earn a higher CAR.

$$AR_{ijdt} = \beta_1 * (Distress_{it} * Crisis_t) + \beta_2 * Crisis_t + \beta_3 * Distress_{it} + \gamma * X_{ijd} + \alpha_t + \alpha_i + \epsilon_{ijdt}$$

$$BHAR_{ijdt} = \beta_1 * (Distress_{it} * Crisis_t) + \beta_2 * Crisis_t + \beta_3 * Distress_{it} + \gamma * X_{ijd} + \alpha_t + \alpha_i + \epsilon_{ijdt}$$

The acquirers performance will be tested on a short- and on a long run. $Distress_{it}$ is measuring if the firm is distressed or not. If the firm is distressed the dummy variable will take the value one. $Crisis_t$ is also a dummy variable, if market is distressed it will take the value one. X_{ijd} is representing the control variables for target *i,* acquirer *j,* and deal characteristics *d.* Furthermore, there is controlled for year fixed effect, α_t, and industry fixed effect, α_i. β_1 is a coefficient that is measuring the combined effect of a crisis and firm-level distress. β_{2-3} is the coefficients that are measuring the impact of a firm, $Distress_{it}$, and the market, $Crisis_t$, being distressed. In order to verify the alternative hypothesis the study expect β_1 to be significantly positive.

4.5.10 Methodological design tenth hypothesis

The tenth null hypothesis is trying to investigate if more experienced acquirers do not have obtain a higher wealth transfer. The alternative hypothesis states that there is a connection between experience and better performance. The rationale is that more experienced firms are more familiar with the processes and better in picking distressed firms that contribute to a higher wealth transferring than lesser experienced firms.

$$CAR_{ijdt} = \beta_1 * \left(Distress_{it} * Experience_{jt}\right) + \beta_2 * Distress_{it} + \beta_3 * Experence_{jt} + \gamma * X_{ijd} + \alpha_t + \alpha_i + \epsilon_{ijdt}$$

$$BHAR_{ijdt} = \beta_1 * \left(Distress_{it} * Experience_{jt}\right) + \beta_2 * Distress_{it} + \beta_3 * Experence_{jt} + \gamma * X_{ijd} + \alpha_t + \alpha_i + \epsilon_{ijdt}$$

The acquirers' performance will be tested on a short- and on a long run. $Distress_{it}$ is measuring if the firm is distressed or not. If the firm is distressed the dummy variable will take the value one. X_{ijd} is representing the control variables for target *i,* acquirer *j,* and deal characteristics *d.* Furthermore, there is controlled for year fixed effect, α_t, and industry fixed effect, α_i. $Experience_{jt}$ is a continuous measure that are counting the number of

prior acquisitions. In order to verify the alternative hypothesis, the study expect that more experience will result in better performance on both a short- and long run. The study expects β_1 to be significantly positive. If the coefficient is positive a significantly positive abnormal return will be associated with distress and the degree of merger experience. β_{2-3} is measuring the variables individually and their effect on the acquirers' performance.

4.5.11 Methodological design eleventh hypothesis

The eleventh and last hypothesis is testing if size matters in determining the performance of the acquirer if the target is distressed. The rationale behind the hypothesis is that large firms can provide more financial aid than smaller firms.

$$CAR_{ijdt} = \beta_1 * \left(Distress_{it} * Size_{ijt}\right) + \beta_2 * Size_{ijt} + \beta_3 * Distress_{it} + \gamma * X_{ijd} + \alpha_t + \alpha_i + \epsilon_{ijdt}$$

$$BHAR_{ijdt} = \beta_1 * \left(Distress_{it} * Size_{ijt}\right) + \beta_2 * Size_{ijt} + \beta_3 * Distress_{it} + \gamma * X_{ijd} + \alpha_t + \alpha_i + \epsilon_{ijdt}$$

The acquirers' performance will be tested on a short- and on a long run. $Distress_{it}$ is measuring if the firm is distressed or not. If the firm is distressed the dummy variable will take the value one. $X_{ijd}$is representing the control variables for target *i,* acquirer *j,* and deal characteristics *d.* Furthermore, there is controlled for year fixed effect, α_t, and industry fixed effect, α_i. $Size_{ijt}$ is a ratio and is measuring the relative size difference between the acquirer and the target. In order to verify the hypothesis, the study expect that a high ratio will result in larger CAR to the acquirer. β_1 is measuring that property as a combined effect of the size ratio and a target being distressed. β_{2-3} is measuring their effects individually.

4.6 Statistical tests

4.6.1 Multiple Regression

To investigate the hypotheses, the study will use multiple regression using the ordinary least square method (OLS). This enables the study to test the relationship between a performance measure against multiple variables simultaneously. This test will try to find variability in different independent variables which can predict the performance of the acquirer. The dependent variable will be CAR and $BHAR$. The independent variables will be the ones that are being tested in the hypotheses and the control variables. The control variables will be thorough all the hypotheses. The multiple regression formula is expressed as (Newbold et alt., 2013:478):

$$Y = \beta_0 + \beta_1 x_{1i} + \beta_2 x_{2i} + \cdots + \beta_K x_{Ki} + \varepsilon_i$$

Where β is the coefficients and x_i is the different independent variables. Y is the performance measure. The ε_i is an error term and have the purpose of being the deviation from the observed and measured Y.

The multiple regression is based on five assumptions (Newbold et alt., 2013:482).

The first assumption is that all X_i should be fixed numbers, or independent of the error term (Newbold et alt., 2013:482).

The second assumption is linearity. The assumption simply states that Y is a linear function of the x_i variables (Newbold et alt., 2013:482). Linearity can be observed in a scatterplot by plotting the residuals. However, because of the fact that a dummy variable is only having to two possible outcomes it is per definition meeting the criteria of linearity.

The third assumption is that all random residuals are normally distributed with a $\mu = 0$ and a constant variance, σ^2. The optimal choice would be carrying out a white test (White, 1980), which is testing for heteroscedasticity. Due to the matrix size of the sample it is not possible to exceed in STATA. Instead a Breusch-Pagan test will be made (Breusch & Pagan, 1979).

To test if the error terms are normally distributed the test by Jarque-Bera will be carried out (Newbold et al, 2013: 611-612).

The fourth assumption is about correlation between the errors terms, which states that the error terms have to be independent (Newbold et alt., 2013:423). To test the assumption the study will use a test developed by Durbin & Watson (1950). This will test for autocorrelation between the residuals.

The fifth assumption is about multi collinearity. In order to satisfy this assumption there must be no correlation between the independent variables (Newbold et alt., 2013:482). This assumption can be tested with a Variance Inflation Factor (VIF) test.

4.6.2 Probit Model

To test the third hypothesis a probit model is needed. The probit model is a binary choice model which is used when the variable can only take two states as it is the case with the independent variable in the third hypothesis.

The probit model is given by (Agresti, 2007:72):

$$Y_i = \alpha + \beta_1 X_{1i} + \cdots + \beta_k X_{ki} + \epsilon_i, \quad i = 1, \ldots, n.$$

Y_i is a binary variable which takes the value zero or one and α is the intercept. β is the regression coefficient. It is this coefficient there is of interest in a probit model because this tells us if X_i can significantly help predicting the outcome of Y_i. A positive β indicates that an increase in the respectively variable shift weight from category zero to category one. Category zero is in this case an industry insider and category one is an industry outsider. This means that the probability of category zero decreases and category one increases when β is positive and vice versa.

The probit model is based there is four assumptions there have to be fulfilled. The first assumption is that there is no perfect multi collinearity. To test the first assumption the variance inflation factor (VIF) is examined. The second assumption is that the independent variable has to be binary. This assumption is fulfilled in this study due to the construction of the independent variable described in section 4.5.3. The third assumption is that the observations has to be independent. This can be tested using a Durbin & Watson (1950) test to examine the autocorrelation between the residuals. At last the probit model requires normally distributed error terms. This is tested by using a Jaque-Bera test of normal distribution.

5 Data

The data section will contain how the data is gathered and how the variables are made. Furthermore, this section will also explain which choices there have been made and which limitations that have been through the data gathering process. Finally, a summary statistic will be conducted in order to see the nature of the data and identify potential outliers there might bias the results.

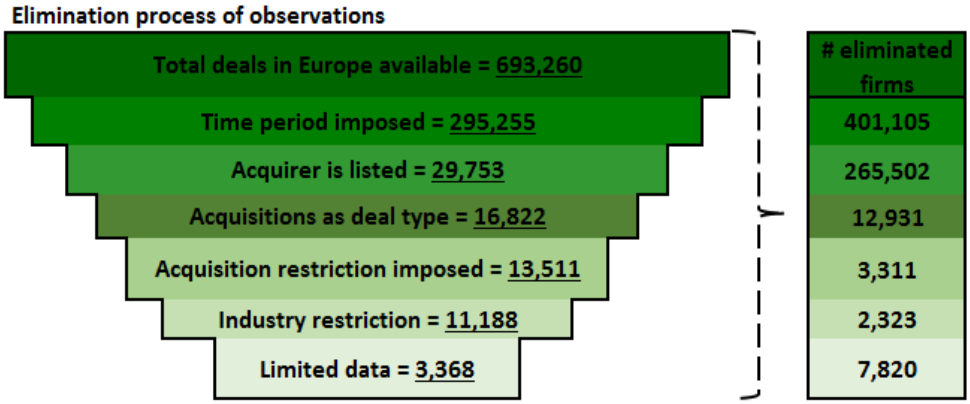
5.1 Sample construction

To carry out the tests of the hypotheses the study will collect all acquisitions from 01.01.2008 to 31.12.2017, which was the longest available period on Orbis. The paper was also considering Compustat, which had a longer horizon but with a significant lack of data within the European market. The projects data comes from four different sources:

- Zephyr was used to gather all deal and IPO data.
- Orbis was used to gather all accounting data.
- All stock & index data was collected in DataStream.
- Bloomberg was used to extract the bond spread.

The figure below is illustrating the filtration process of deals:

Figure 2 - Summary of the data selection process



**Of one's own make*

The first constraint was world regions on targets. All regions within Europe was selected. This constraint resulted in 696,360 deals. Next, the deal has to be completed-confirmed in the time period 01.01.2008 to 31.12.2017. This resulted in 295,255 deals.

The next constraint is that the acquirer has to be listed on a stock exchange, while the target can be either listed or unlisted. This resulted in a reduction to 29,753 deals. This enables the paper to evaluate the performance of the acquirer through its stock price. The target on the other hand do not have to be a listed company. The reason why the paper includes unlisted target is due to data constraint on the European market in the period. Furthermore, the deal type is specified to only take out acquisitions. This resulted in 16,822 deals.

The next constraint is that the acquirer cannot have determining influence in the firm already. Therefore, they have to own less than 50 percent in advance. This means that the acquirer ahead from the deal is not controlling the firm. The rationale behind this, is that if the acquirer had the majority of the shares they would already have controlling influence. Hence, the synergies would already be incorporated in the share price. This is due to that the acquirer already run the firm as in best use for them.

Another restriction is that they have to buy at least 50 percent of the firm. This makes them in a position where they gain controlling influence over the firm after the completion date. This gave the study 13,511 deals.

Furthermore, the paper also eliminates all deals within the financial industry (SIC: 6000-6999) and utilities (SIC: 4900-4999). This removes 1786 financials and 537 utility deals from the sample. The reason is that engagement from the government may affect the sectors. The reason why financial industries are being removed is because they are highly regulated and their assets are very liquid compared to other industries. Utilities is also being removed, because the government is having a major impact on the sector.

The dataset thereafter contains a total of 11,188 deals. Afterwards the study take out the targets Bureau van Dijk ID numbers and pull out their financial data in Orbis. Afterwards, all deals with moderate data is eliminated. This gives the study a total population of 3368 deals, which the paper will examine further.

Datastream is used to obtain return data both to estimate the CAR for the short-term performance and to estimate BHAR for long-term performance.

It is important to emphasize that not all observations will be used in all hypotheses, it will depend on whether there is sufficient data on the independent variables to be included in the test for the respective hypothesis.

5.2 Data Collection hypotheses

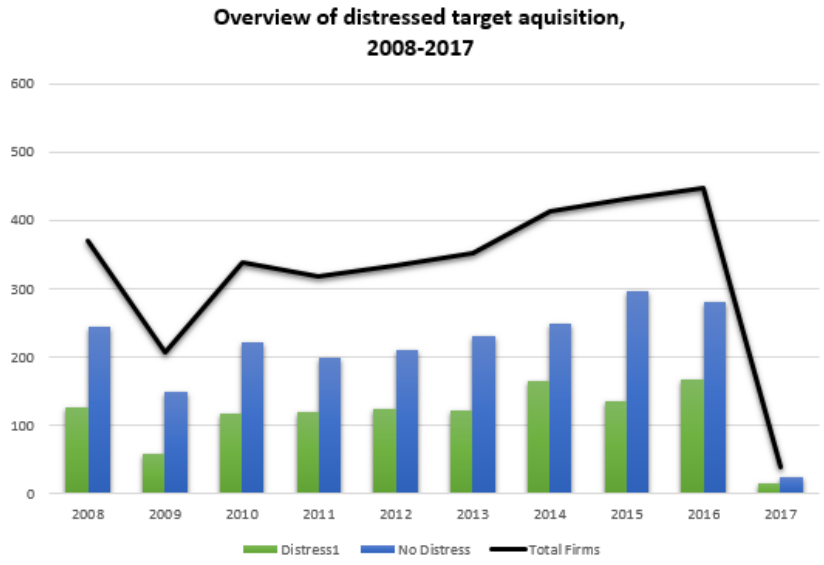
5.2.1 Data collection first hypothesis

As mentioned in section 4.3.1 there are several measures used in previous literature as a proxy for distress. As mentioned earlier it is not possible to use distress measures that requires stock data of the target. Therefore, the only choice of estimating distress is by choosing accounting based measures. The choice of proxy is primarily based on data constraints. A distress measure based on interest coverage ratio will reduce the sample size a lot and will result in only 435 observations. Because of that it will not be used as a proxy.

This paper will use two proxies for distress. One of the key elements in this study is to classify firms as distressed. All the results will depend on how firms are being categorized as distressed or non-distressed. Therefore, it is reasonable to apply two proxies to give more robust results.

The first proxy for distress follows the approach of Pulvino (1998) and Oh (2014). The current ratio and the leverage ratio is collected. The variable $Distress1_{it}$ is then a dummy variable, which takes the value one if the current ratio is lower than the industry median and the leverage ratio is above the industry median. The industry is classified as all firms with the same 3-digit SIC-code. The distribution of distressed targets versus non-distressed targets acquired over time can be seen in the figure below:

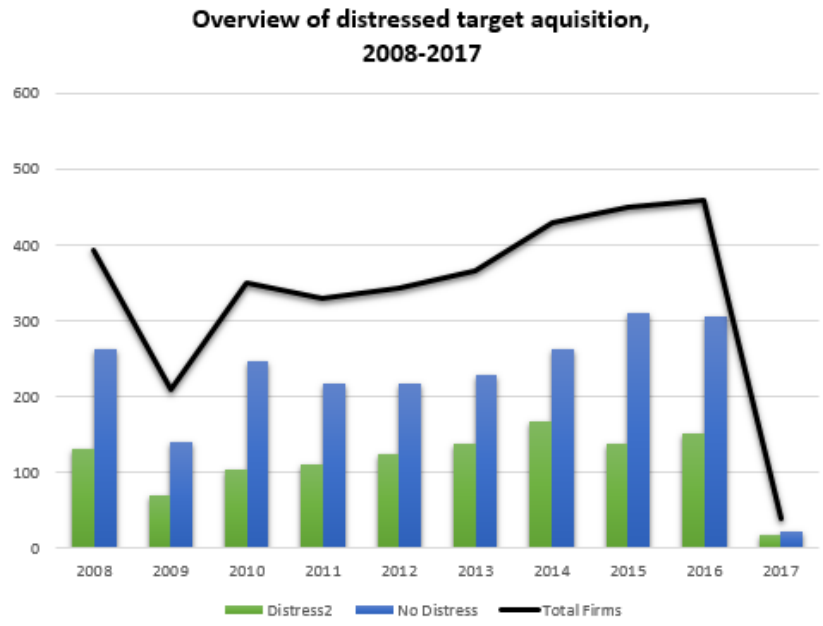
Figure 3 - Summary of distressed acquisitions



**Of one's own make*

As the second proxy for distress, the paper uses one of the most common proxies for distress in the literature (e.g., Ang & Mauck, 2011; Bhaghat et al., 2005; John et al., 1992; Li, 2010). $Distress2_{it}$ is also a dummy variable, which takes the value one if the target has negative net income in the year before the acquisition. Oh (2014) argues that the measure is a poor measure of distress due to an increasing number of high-tech firms, which operates with negative net income without necessarily being distressed. This might classify more firms as distressed, than in the real world. This may bias the acquirer performance and create noise in the abnormal returns. Because some firms are classified as distress when they should not. However, due to data constraints it is the best second proxy for distress that it is possible to obtain on the European market. Also, one important notice is that the paper is based on two proxies for distress. The findings in the paper will not solely rely on one single measure of distress. The distribution of distressed versus non-distressed targets acquired over time when using the second distress measure can be seen in the figure below:

Figure 4 -Summary of distressed acquisitions



**Of one's own make*

When comparing the two tables above one can see that there is coherence between how the two measures classify firms as distressed versus non-distressed. The distributions can be seen in the figures below:

Figure 6 - Distribution of first distress measure

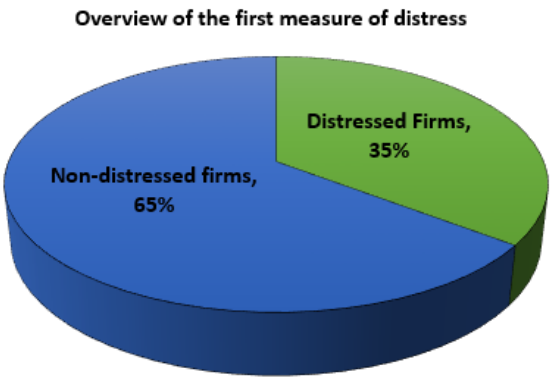
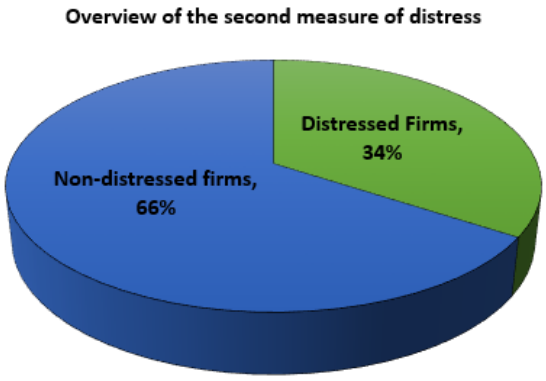


Figure 5 - Distribution of second distress measure



**Of one's own make*

As seen in pie chart above the first distress measure $Distress1_t$ classifies 35 percent of the targets as distressed. This is a bit lower than the paper of Oh (2014), which use the same method of classifying firms as distressed and classifies 40.15 percent of the targets as distressed. However, his study is conducted on the US market why one would not expect an identical result. The deviation is not considered too far away from previous literature why it is considered as a valid result.

The second measure of distress, $Distress2_t$, classifies 34 percent of the firms as distressed. This percentage is quite close to the first measure of distress in this paper. Also, when looking into the literature which uses the same proxy to categorize firms as distress it is quite close to their results. Ang & Mauck (2011) classifies 37.17 percent of the targets as distressed. Again, one would not expect an identical result as their study is conducted on the US market. Their percentage is close to the one in this paper, why there is nothing there indicates it should not be a good measure to use on the European market.

5.2.2 Data collection second hypothesis

The measures of distress used for this hypothesis are the same as described in section 5.2.1. To test this hypothesis a proxy for industry distress is needed. In the discussion about measures for industry distress in section 4.3.2 a proxy using sales growth in the industry is described. This will be the proxy applied in this paper. The sales growth in the year of acquisition is collected from all the industry peers. A firm is classified as an industry peer if it has the same 3-digit SIC-code. This proxy is widely used in the previous literature (e.g. Acharya et al., 2007; Gopolan & Xie, 2011; Oh, 2014; Opler & Titman, 1994). $IndustryD_{it}$ is a dummy variable taking the value one if the industry if classified as distressed. An industry is classified as distressed if the median sales growth in the industry is negative in the year of acquisition.

Figure 7 - Distribution of fire-sales acquisitions with first distress measure

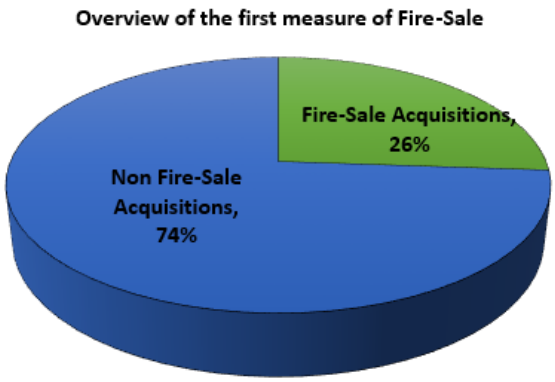
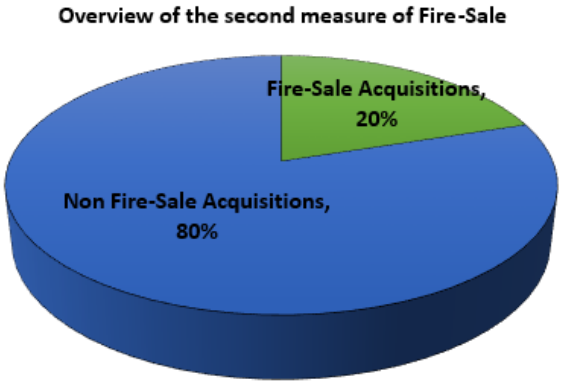


Figure 8- Distribution of fire-sales acquisitions with second distress measure



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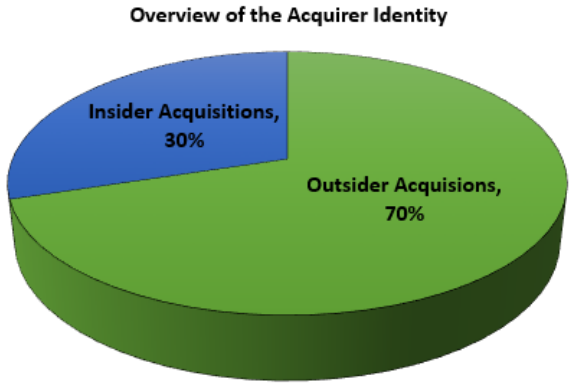
As seen in the figures above when using the first distress measure 26 percent of the acquisitions are considered a fire-sales acquisition. A fire-sales acquisition is defined as an acquisition of a distressed target in a distressed industry. When using the second measure of distress, only 20 percent of the acquisitions are classified as fire-sales acquisitions even though the percentage of firms classified as distress was only slightly below. The large difference in fire-sales acquisitions of 6 percentage points in the same sample, underlines the importance of more than one firm-level distress measure to ensure robustness of the results.

5.2.3 Data collection third hypothesis

To test the third hypothesis proxies for firm-level distress, industry-level distress and outsiders is required. The proxies for both measures of distress mentioned earlier in section 5.2.1 and 5.2.2 are also used in this hypothesis. Furthermore, acquires need to be classified as industry insiders or outsiders. An industry outsider is, as through the whole paper, classified as a firm with a different first 3-digit SIC-code. One could argue that a less restrictive classification also could be used as a proxy. An example could be if only the first 2-digits of the SIC-code had to match. However, most studies within distressed target acquisition uses 3-digit SIC-code. Therefore, all SIC-codes

of both targets and acquirers are collected so it is possible to make this classification. In the figure below acquisitions by industry insider's contra industry outsiders is shown:

Figure 9 - Summary of acquirer identity



**Of one's own make*

As seen in the table above the acquirer comes from a different industry than the target in 70 percent of the cases. Another important aspect of this hypothesis is also how many of the prior defined fire-sales acquisitions is acquired by outsiders as Shleifer & Vishny's (1992) theory predicts. Therefore, acquisitions are split on both acquirer identity and if it is a fire-sales acquisition in the following table:

Figure 10 - Summary of fire-sales acquisitions and acquirer identity

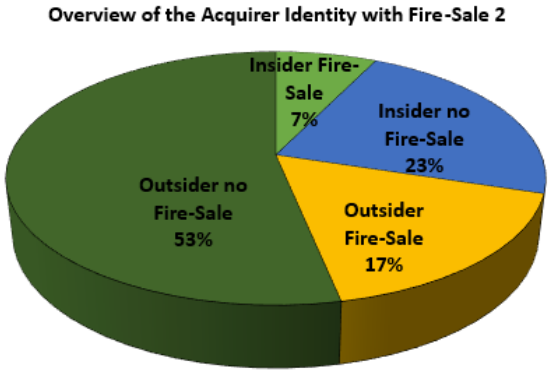
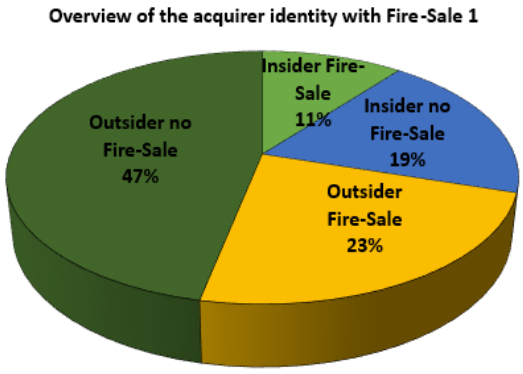


Figure 11 - Summary of fire-sales acquisitions and acquirer identity



** Of one's own make*

As seen in the tables above industry outsiders conduct the largest number of fire-sale acquisitions. One should remember that industry outsiders also acquired more firms in total than industry insiders. The relative difference is approximately the same. At first sight, from the tables above, it does not seem that industry outsiders are

more likely to conduct fire-sale acquisitions. However, this will be examined further in the analysis with statistical tests.

5.2.4 Data collection fourth hypothesis

To test the fourth hypothesis data regarding whether if the target is acquired from an industry insider or industry outsider is needed. Data and proxies for firm- and industry-level distress is also necessary. This data is already described and collected in section 5.2.1, 5.2.2 and 5.2.3.

5.2.5 Data collection fifth hypothesis

To test the fifth hypothesis a proxy for implicit competition is needed. Following Meier & Serveas (2015) the implicit competition is estimated by using the number of firms in the industry. The industry is classified as firms with the same 3-digit SIC-Code. Another way to test the impact of competition on the fire-sales discount Meier & Serveas (2015) also uses how many bids there have been on a particular target. This data is unfortunately not available in Europe. Hence, the proxy cannot be applied in the paper.

5.2.6 Data collection sixth hypothesis

In the sixth hypothesis only one proxy, besides the ones found in previous sections, is collected. As a proxy for asset specificity a widely used measure in the literature is R&D expenditures (e.g. Kim, 2018; Kim & Kung, 2016: Oh, 2014) and R&D expenditures plus advertising expenditures (Balakrishnan & Fox, 1993; Bradley et al., 1984; Titman & Wessels, 1988). However, all the studies are performed on the US market. Advertising expenditures cannot be obtained at all and there is only very limited data on R&D expenditures. It was only possible to obtain 112 targets with reported R&D expenses. Using R&D expenses will not provide the paper with a sufficient amount of observations. Because of that, an alternative proxy, which have not been used before in previous literature, is necessary to test the impact of asset specificity on the fire-sales discount on the European market.

Crépon et al. (1998) finds a significant relationship between research input (R&D expenditures) and innovation output. The innovation output is measured in number of patents. An earlier study by Pakes & Griliches (1981) has also shown a strong relationship between R&D expenditures and patent applications. These studies show, quite intuitive that patents are a product of R&D intensity. Patent application data is not available. However, number of patents is. Number of patents will be used as proxy for asset specificity as this is the best proxy available on the European market. Another argument for the use of patents as a proxy for asset specificity is that citations of patent from the acquirer plays a huge role in the synergy gains. One would expect that industry insiders have more overlap in patents with targets from the same industry. Hence, a firm with more patents

would have assets there is harder to utilize at its full potential for an industry outsider why an industry insider is supposed to have a higher valuation of the assets.

Finally, the number of patents will be scaled with the book value of assets to adjust for size. By making this adjustment larger firms, which tends to have more patents, will not have a larger weight in the results.

5.2.7 Data collection seventh hypothesis

To test the seventh hypothesis, the study needs data whether the target is listed or unlisted.

Figure 12 - Overview of public and private firms

**Of one's own make*

As seen in the figure above the distribution of listed and unlisted firms is highly uneven. One percent of the firms are listed, whereas the remaining firms are unlisted. This data constraint on listed targets are a major weakness for the test because such a tiny population of listed firms might not give a truthful picture of the reality. The reason is that all performance measures from the acquisition of listed targets will have a much higher weight than the acquisition of unlisted targets.

5.2.8 Data collection eighth hypothesis

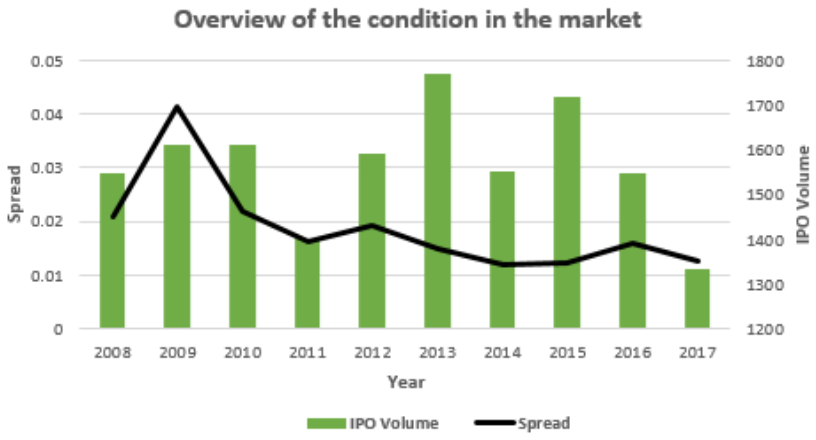
To test the eight hypothesis data regarding the equity- and debt market conditions has to be collected. Following Officer (2007) IPO volume is used as a proxy for the difficulties and costs associated with issuing equity. The volume of all European IPOs, IPO_{vol_t}, is collected in each year in the delimited period.

Officer (2007) and her refrains are using the spread of Corporate and Institutional bonds over the treasury rate as a proxy for how difficult and costly it is to obtain alternative funding in the debt market. At the European market it has not been possible to collect these spreads. Therefore, an alternative proxy is needed. Another

proxy could be to use credit migration data. The subscription on Wharton Research Databases does not include Capital IQ S&P Credit ratings for students. So, these data were neither possible to collect. The proxy used in this study is therefore a C&I spread using the spread between Bloombergs aggregate index of US Corporate bonds and the US treasury rate. It is not the optimal proxy since this study aims to investigate the conditions on the European market. However, one could argue that the US bond market is the largest in the world and would be an indicator for how the conditions are on the other bond markets.

The graph shows the spread and the IPO volume in the same diagram. The rationale behind the combined graph is to show how the two proxies relates to each other. These trends on the debt market and the IPO volume is creating the foundation for the conditions in the market.

Figure 13 - Market conditions



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The left hand-side of the graph is representing the spread, whereas the right hand-side is the IPO-volume. The x-axis is timeline which is showing the development from the period 2008-2017.

5.2.9 Data collection ninth hypothesis

To test the ninth hypothesis, a measure for crisis period is needed. Prior literature has used National Bureau of Economic Research (NBER) month classified as recession's month (e.g. Ang & Mauck, 2011). It has not been possible to find similar data in EU. The NBER months there is classified as recession months is from December 2007 – June 2009. Even though NBER has classified the month based on the US. Europe have had negative GDP growth in all of the month. Europe has in July 2009 positive GDP growth. One important note is that NBER does

not only classify periods of crisis solely on GDP growth[1]. So, one could argue that it would be a fair assumption to use the recession months because seems like the European economy has at least some correlation with the US economy. The variable to this measure is named $Crisis_t$ and is a dummy variable which take the value one if the deal is announced in a crisis month.

5.2.10 Data collection tenth hypothesis

Following Fowler & Schmidt (1989) acquirer experience is measured by the number of previous acquisitions conducted by the acquirer. The deal database used in this paper contains data from 01.01.1997. This date is chosen as a starting point to measure prior experience. These previous deals are accumulated up to the day before the announcement of acquisition and serves as a proxy for acquirer experience.

5.2.11 Data collection eleventh hypothesis

To test the eleventh hypothesis a proxy for relative size is needed. There are several good proxies. A proxy which could have been a good indicator could be the ratio between the market value of equity between the acquirer and the target. However, as seen in figure 12 all targets are not listed so this is not a possibility. Following Bruton et al. (1994) the relative size between acquirers and targets revenue is used. It is also a proxy where there is a lot of data available. This proxy will be used in this study.

5.3 Summary statistics

This section serves two purposes. First, the gathered data will be examined for outliers there potentially can bias the results. Second, an overview of the data gathered through this chapter will be presented.

As seen in appendix 1 a Box-and-Whiskers plots on all the data for the independent variables has been conducted. The independent variables there is dummy variables have not been examined. This section will discuss if these influential data should be removed. The line below and above first quartile and third quartile is called whiskers (Newbold et al., 2013:69). If the data are outside these whiskers it is considered as an outlier. These potential outliers have been examined. All outliers besides some on size have been found to be consistent with the reality. When considering size, there is seven outliers above the third quartile there have been found not to be consistent with the reality by a manual check. Furthermore, there is two size

[1] NBER does define a crisis period as a significant decline in economic activity all over the economy. It takes GDP growth, real income, industrial production, unemployment and retail sales into account.

observations there is beneath the first quartile. These two relative size measures are negative. It is not a reason to exclude them just because of the sign since it is possible with negative revenue if a sale is returned in another year of assessment. However, these negative signs have not been in line with the reality. An outlier is referred to as a mistake done by the researcher (Newbold et al., 2013:461). It is only acceptable to remove outliers in special cases or when there is a definite mistake (Newbold et al., 2013:464). Since these are mistakes these observations have been removed and are not considered in the eleventh hypothesis where size is used.

After the outlier have been removed a summary statistic can be seen in the table underneath:

Table 2 - Summary statistics

	Mean	Median	Std. Dev.	Min	Max	Obs
Independent characteristics						
$Distress1_{it}$	0.3533	0.0000	0.4781	0.0000	1.0000	3,249
$Distress2_{it}$	0.3420	0.0000	0.4745	0.0000	1.0000	3,368
$Firesale1_{it}$	0.3533	0.0000	0.4781	0.0000	1.0000	3,249
$Firesale2_{it}$	0.2417	0.0000	0.4282	0.0000	1.0000	3,368
$IndustryD_{it}$	0.5294	1.0000	0.4992	0.0000	1.0000	3,368
Out_{ijt}	0.7016	1.0000	0.4576	0.0000	1.0000	3,368
$Competition_{it}$	617.8637	179.0000	948.9693	0.0000	2,649.0000	3,368
$AssetSpecificity_{it}$	0.0004	0.0000	0.0065	0.0000	0.2912	3,365
$Unlisted_{it}$	0.9831	1.0000	0.1290	0.0000	1.0000	3,368
IPO_{vol}	1,590.2586	1,593.0000	103.7396	1,333.0000	1,769.0000	3,368
$Spread_t$	1.7825	1.6096	0.7312	1.0835	4.5083	3,346
$Crisis_t$	0.1416	0.0000	0.3487	0.0000	1.0000	3,368
$Experience_i$	13.9053	7.0000	18.5007	0.0000	241.0000	3,368
$Size_i$	1.8322	0.0108	19.9751	0.0000	679.3246	2,666
Acquirer characteristics						
Tobin's Q	1.2408	0.8895	1.5418	0.0060	49.3930	2,820
Operating Revenue	5,844,925.2252	906,411.9554	16,817,541.8793	1.5718	404,254,000.0000	3,196
Total Assets	10,666,949.0312	1,066,293.5927	65,323,272.5439	8.3746	2,668,189,539.7276	3,168
Market Capitalization	7,351,068.4536	826,990.9989	24,644,938.7809	66.9178	625,348,843.8220	3,069
Market-to-Book	2.7366	1.9665	9.4601	-194.3920	342.8720	3,026
Tangible Assets	2,051,241.0847	132,333.4265	9,702,727.9787	1.5745	273,153,269.8893	3,128
Total Debt	2,082,239.8975	172,856.2228	11,763,540.9809	0.0000	453,443,000.0000	3,117
Leverage	0.2186	0.2022	0.2686	0.0000	11.0286	3,167
Tangibility	0.1849	0.1181	0.1837	0.0001	0.9853	3,128
Target characteristics						
Operating Revenue	71,795.9769	8,941.1556	381,068.7986	0.0510	9,788,828.1628	2,818
Total Assets	66,019.2281	6,176.7708	395,176.5709	0.0016	9,638,709.5649	3,365
Tangible Assets	18,893.9454	376.1779	199,041.3399	0.0710	7,446,951.2608	2,874
Total Debt	23,626.1379	283.4221	239,026.0009	0.0000	7,631,851.4910	3,249
Leverage	0.2286	0.1237	0.2478	0.0000	0.8905	3,365
Tangibility	0.1629	0.0638	0.2191	0.0000	2.9690	2,874
Deal characteristics						
All Cash Payment	0.0840	0.0000	0.2775	0.0000	1.0000	3,368
All Stock Payment	0.0389	0.0000	0.1934	0.0000	1.0000	3,368
Toehold	0.0162	0.0000	0.0813	0.0000	0.5000	3,368

**Of one's own make*

The figure above is presenting the key variables used to answer the hypotheses. All accounting data is listed in thousands US dollars. The independent variable characteristics are all used in different settings to investigate the hypotheses. The acquirer characteristics are all variables related to the acquirer. Some of them are used as control variables throughout the analysis others are stated to describe the nature of the acquirers in the data set. The target characteristics are variables related to the target. The variables used to control for target characteristics are also presented in the table above. The deal characteristics are also lined up, these characteristics are all control variables. The table above serve the purpose of explaining how the different variables look like. The mean and median values are shown for all variables. This contributes with a brief overview of how the average deal in the data looks like. The standard deviation is shows how much these deals deviates from each other. The minimum and maximum observations are also listed to show which span the study is performed within. Another interesting deal characteristics there could have been relevant to include would have been deal value. However, these are only disclosed at a low number of deals why this would not give a better overview of the data. The full dataset can be seen in appendix 2.

6 Analysis

In this section will all the developed hypothesis in chapter three be tested. A complete overview of the regressions with all control variables, besides the fixed-effects, can be seen in appendix 3 to 13. At last some alternative tests of the long-term performance will be conducted. In-depth discussions of the results will be examined in the next chapter.

6.1 Analysis of hypothesis one

This section considers the first hypothesis, which states that distressed targets are acquired with a higher discount than regular targets. The hypothesis is as follows:

H_1*: Distressed targets are acquired at a higher discount.*

To test the hypothesis two regressions are set up to find a relationship between distress and acquirer performance on short- and long-term. The two tests are formulated in the following way:

$$CAR_{ijdt} = \beta_1 * Distress_{it} + \gamma * X_{ijd} + \alpha_t + \alpha_i + \epsilon_{ijdt}$$

$$BHAR_{ijdt} = \beta_1 * Distress_{it} + \gamma * X_{ijd} + \alpha_t + \alpha_i + \epsilon_{ijdt}$$

Prior to the analysis it is a necessity to investigate the variables, and if they fulfill the assumptions for a multiple regression as mentioned in section 4.6.1. These assumptions are carried out on both short- and long-term performance with respect to the two different measures of distress.

In the first column (1) the results obtained when using the first distress measure, $Distress1_{it}$, will be shown. Column (2) will represent the results of the second distress measure, $Distress2_{it}$, on short-term.

Afterwards the long-term performance will be examined. In column (3) test statistics of BHAR with $Distress1_{it}$ measure will be shown. Finally, column (4) will contain the results of the long-term performance when using the second distress measure $Distress2_{it}$.

Table 3 summarizes the test results of the assumptions as described in section 4.6.1. All the results can be found in appendix 14 and 15.

Table 3 - Assumptions of the first hypothesis

Assumptions	Conditions	Short-term		Long-term	
		(1)	(2)	(3)	(4)
Assumption 1	Independet residuals	yes	yes	yes	yes
Assumption 2	Linearity	yes	yes	yes	yes
Assumption 3	Normal distribution	no	no	no	no
	Heteroscedasticity	no	no	no	no
Assumption 4	Autocorrelation	no	no	no	no
Assumption 5	Multi collinearity	no	no	no	no

*Of one's own make

As seen in the table above, assumption three to five is not fulfilled on both short- and long-term. This is an immediate weakness for the test. This means that the results should be interpreted carefully.

After testing the assumptions, the regressions are made. The results are listed in the table below.

Table 4 - Results of the first hypothesis

Dependent variable	CAR		BHAR	
	(1)	(2)	(3)	(4)
$Distress1_{it}$	0.0057657**		-0.0110652	
	(2.00)		(-0.76)	
$Distress2_{it}$		0.0061879**		0.0287661*
		(2.41)		(1.95)
Control: Acq	Yes	Yes	Yes	Yes
Control: Target	Yes	Yes	Yes	Yes
Control: Deal	Yes	Yes	Yes	Yes
Control: Year Fixed Effect	Yes	Yes	Yes	Yes
Control: Industry Fixed Effect	Yes	Yes	Yes	Yes
Observations	2,230	2,290	2,138	2,198
$Adjusted - R^2$	0.0968	0.1411	-0.0438	-0.0687
Coefficients are listed above and T-statistics are in brackets				
, **, * are 10%,5%,1% confidence level respectively*				

**Of one's own make*

As seen in the table above the tests in column (1) and (2) show a positive relationship between acquirer performance and distress on both measures on short-term. This means that the null hypothesis is rejected on a 95 percent confidence level for the both measures of distress after controlling for known effects. The alternative hypothesis is accepted, which means that distressed targets are acquired at a higher discount since the acquirer experience an abnormal short-term return. This would not be the case if the target was acquired for a fair market value. The results reveal that an acquisition of a distressed target is predicted to yield a higher abnormal return of 0.058 percent and 0.062 percent compared to acquire a non-distressed target. The coefficient of

determination is quite similar to earlier studies and the model with the first measure of distress explains 9.68 percent of the returns while the second model can have a bit higher explanatory power with 14.11 percent.

In the long-term only the second distress measures in column (4) are significant on a 90 percent confidence level after controlling for known effects. This means that the null hypothesis cannot be rejected. The coefficient is also indicating that the acquirer is experiencing a gain four month after the acquisition on average. The first distress measure is insignificant, this further confirms that the null hypothesis cannot be rejected. As mentioned before this give rise to uncertainty because the model becomes less robust. An important notice is to emphasize that the coefficient of determination is negative on the long term. An explanation for this can be the use of many independent variables there does not help explain the returns. Because the fixed-effects are made with dummy variables.

To sum up the results indicate a short-term gain for the acquirer if the target is distressed. These results are also in line with what was expected. Thus, the results are indicating an expected outcome the robustness of the results should be taking into consideration because the violation of the assumptions.

6.2 Analysis of hypothesis two

In extension with the prior analysis, the second hypothesis is stating that if the industry is also distressed the discount is even higher:

H_2: *Distressed targets are acquired at a higher discount when their industry is distressed.*

To test the hypothesis a regression will be made to test the relationship on a short- and long-term. The two regressions are stated below:

$$CAR_{ijdt} = \beta_1 * Firesale_{it} + \beta_2 * \ Distress_{it} + \beta_3 * IndustryD_{it} + \ \gamma * X_{ijd} + \alpha_t + \alpha_i + \epsilon_{ijdt}$$

$$BHAR_{ijdt} = \beta_1 * Firesale_{it} + \beta_2 * \ Distress_{it} + \beta_3 * IndustryD_{it} + \ \gamma * X_{ijd} + \alpha_t + \alpha_i + \epsilon_{ijdt}$$

As performed in the prior analysis the assumptions of the independent variables will be investigated.

In the first column (1) the results obtained when using the first distress measure, $Distress1_{it}$, will be shown. Column (2) will represent the results of the second distress measure, $Distress2_{it}$, on short-term.

Afterwards the long-term performance will be examined. In column (3) test statistics of BHAR with $Distress1_{it}$ measure will be shown. Finally, column (4) will contain the results of the long-term performance when using the second distress measure $Distress2_{it}$.

Table 5 summarizes the test results of the assumptions as described in section 4.6.1. All the results can be found in appendix 14 and 16.

Table 5 - Assumptions of the second hypothesis

Assumptions	Conditions	Short-term		Long-term	
		(1)	(2)	(3)	(4)
Assumption 1	Independet residuals	yes	yes	yes	yes
Assumption 2	Linearity	yes	yes	yes	yes
Assumption 3	Normal distribution	no	no	no	no
	Heteroscedasticity	no	no	no	no
Assumption 4	Autocorrelation	no	no	no	no
Assumption 5	Multi collinearity	no	no	no	no

**Of one's own make*

As seen in the table above, assumption three to five is not fulfilled on both short- and long-term. This is an immediate weakness for the test. This means that the results should be interpreted with care.

The variables are specified in section 5.2.2. As before two distress measures are used to ensure robustness in the tests. The results of the test can be seen in the table below.

Table 6 - Results of the second hypothesis

Dependent variable	CAR		BHAR	
	(1)	(2)	(3)	(4)
$Firesale1_{it}$	0.011232***		0.0026811	
	(3.33)		(0.16)	
$Firesale2_{it}$		0.0117536**		0.0091016
		(2.25)		(0.30)
$IndustryD_{it}$	-0.0119117***	-0.0082174**	-0.0296897	-0.0339614*
	(-3.10)	(-2.35)	(-1.53)	(-1.70)
$Distress1_{it}$	0		0	
	(omitted)		(omitted)	
$Distress2_{it}$		-0.001131		0.0238159
		(-0.27)		(0.98)
Control: Acq	Yes	Yes	Yes	Yes
Control: Target	Yes	Yes	Yes	Yes
Control: Deal	Yes	Yes	Yes	Yes
Control: Year Fixed Effect	Yes	Yes	Yes	Yes
Control: Industry Fixed Effect	Yes	Yes	Yes	Yes
Observations	2,230	2,290	2,138	2,198
$Adjusted - R^2$	0.1011	0.1438	-0.043	-0.0681
Coefficients are listed above and T-statistics are in brackets				
, **, * are 10%,5%,1% confidence level respectively*				

**Of one's own make*

As seen above in column (1) the $Firesale1_{it}$ interaction term shows significance on a 99 percent confidence level controlled for known effects. $Firesale2_{it}$ in column (2) has a significant positive coefficient on a 95 percent confidence level. The theory suggests that if the target and industry is distressed fire-sales will occur. This is in line with the findings. The alternative hypothesis is confirmed and distressed targets in a distressed industry is sold at a discount. These results show that if a firm is distressed and its industry is distressed acquirers can earn an even larger return compared to just buying a distressed firm in a non-distressed industry. An important note is that in both column (1) and (2) the coefficient of industry distress is significantly negative on a 99 percent and 95 percent confidence level, respectively. This suggest that if an acquirer buys a non-distressed target in a distressed industry the abnormal return will be negative.

The distress measure (1) is omitted because of multi collinearity, which was a concern due to the high VIF value see appendix 2 sheet 2. An interesting finding is that both distress measures becomes insignificant. This suggests that the findings in the first hypothesis is primarily driven by industry distress rather than solely firm-level distress.

On the long-term the test is accepting the null hypothesis on both measures. This means that no effect can be found to support the theory in favor of the alternative hypothesis. The results are surprising in the sense that the short-term was highly affected by fire-sales discount, whereas the effect is vanished on the long-term. There can be several reasons for the results and will be discussed further in the discussion.

It is relevant to mention that the coefficient of determination is positive on short-term and negative on long-term. This is due to the number of independent variables included in the test.

6.3 Analysis of hypothesis three

One of the implications of Shleifer & Vishny's (1992) theory is that when a firm faces distress the industry peers are more likely to face distress themselves and do not have the opportunity to buy the distressed firm. Because of that one would expect that it is more likely for an acquirer outside the industry to buy the target instead of industry peers. This leads to the following hypothesis:

H_3: *Distressed targets in distressed industries are more likely to be acquired by outsiders.*

To test this hypothesis a probit model is set up:

$$Prob(Out_{ijdt}) = \beta_1 * Firesale_{it} + \beta_2 * \ Distress_{it} + \beta_3 * IndustryD_{it} + \ \gamma * X_{ijd} + \alpha_t + \alpha_i + \epsilon_{ijdt}$$

Table 5 summarizes the test results of the assumptions as described in section 4.6.1. All the results can be found in appendix 14 and 17.

Table 7 - Assumption of the third hypothesis

Assumptions	Conditions	Probit	
		(1)	(2)
Assumption 1	Multi collinearity	no	no
Assumption 2	Independent variables	yes	yes
Assumption 3	Autocorrelation	no	no
Assumption 4	Normal distribution	no	no

**Of one's own make*

As seen in the table above, assumption one, three and four fulfilled. This is an immediate weakness for the test. This means that the results should be interpreted with care.

The results of this probit model is stated in the table below:

Table 8 - Results of the third hypothesis

Dependent variable	Out	
	(1)	(2)
$Firesale1_{it}$	0.0479214 (0.38)	
$Firesale2_{it}$		0.274285 (1.43)
$IndustryD_{it}$	0.0666293 (0.47)	0.0247602 (0.26)
$Distress1_{it}$	0 (omitted)	
$Distress2_{it}$		-0.01466400 (-0.13)
Control: Acq	Yes	Yes
Control: Target	Yes	Yes
Control: Deal	Yes	Yes
Control: Year Fixed Effect	Yes	Yes
Control: Industry Fixed Effect	Yes	Yes
Observations	1,328	1,367
Pseudo R2	0.2636	0.2658
Coefficients are listed above and z-statistics are in brackets **, **, *** are 10%,5%,1% confidence level respectively*		

**Of one's own make*

As seen in the table above all coefficients are insignificant. Therefore, it is not possible to predict the acquirer identity from firm- and industry-level distress. One would expect significant positive coefficient on either the fire-sale measures or industry distress measures. Since this would show that firm- and industry-level distress increases the probability for a firm to be acquired by an industry outsider. However, this is not the case. These results contradict Shleifer & Vishny's (1992) theory. These findings will be discussed in a later section.

6.4 Analysis of hypothesis four

Thus far, the hypothesis has been building on the assumptions that firm- and industry-level distress drives the price discount. The fourth hypothesis is stating that an acquirers identity also has an effect on the price discount:

H_4: *Distressed targets in distressed industries are acquired by a higher discount when it is bought of an industry insider compared to an industry outsider*.

Below two regressions are set up to test whether acquirer identity also have an impact on the price discount:

$$CAR_{ijdt} = \beta_1 * (Out_{ijt} * Distress_{it} * IndustryD_{it}) + \beta_2 * Out_{ijt} + \beta_3 * \ Distress_{it} + \beta_4 * IndustryD_{it} + \ \gamma * X_{ijd} + \alpha_t + \alpha_i + \epsilon_{ijdt}$$

$$BHAR_{ijdt} = \beta_1 * (Out_{ijt} * Distress_{it} * IndustryD_{it}) + \beta_2 * Out_{ijt} + \beta_3 * \ Distress_{it} + \beta_4 * IndustryD_{it} + \ \gamma * X_{ijd} + \alpha_t + \alpha_i + \epsilon_{ijdt}$$

As performed in the prior analysis the assumptions of the independent variables will be investigated. In the first column (1) the results obtained when using the first distress measure, $Distress1_{it}$, will be shown. Column (2) will represent the results of the second distress measure, $Distress2_{it}$, on short-term.

Afterwards the long-term performance will be examined. In column (3) test statistics of BHAR with $Distress1_{it}$ measure will be shown. Finally, column (4) will contain the results of the long-term performance when using the second distress measure $Distress2_{it}$.

Table 9 summarizes the test results of the assumptions as described in section 4.6.1. All the results can be found in appendix 14 and 18.

Table 9 - Assumptions of the fourth hypothesis

Assumptions	Conditions	Short-term		Long-term	
		(1)	(2)	(3)	(4)
Assumption 1	Independet residuals	yes	yes	yes	yes
Assumption 2	Linearity	yes	yes	yes	yes
Assumption 3	Normal distribution	no	no	no	no
	Heteroscedasticity	no	no	no	no
Assumption 4	Autocorrelation	no	no	no	no
Assumption 5	Multi collinearity	no	no	no	no

**Of one's own make*

As seen in the table above assumption three to five is not fulfilled on both short- and long-term. This is an immediate weakness for the test. This means that the results shall be interpreted carefully.

Below is a table of the results from the two regressions:

Table 10 - Results of the fourth hypothesis

Dependent variable	CAR		BHAR	
	(1)	(2)	(3)	(4)
$(Out_{ijt} * Distress1_{it} * IndustryD_{it})$	0.0102026** (2.03)		0.003641 (0.14)	
$(Out_{ijt} * Distress2_{it} * IndustryD_{it})$		0.0303204*** (5.39)		0.0160821 (0.50)
$Firesale1_{it}$	0.00453 (0.96)		0.0001693 (0.01)	
$Firesale2_{it}$		-0.0084105 (-1.31)		-0.0024447 (-0.07)
$IndustryD_{it}$	-0.0117581*** (-3.06)	-0.008309** (-2.39)	-0.0296903 (-1.53)	-0.0341197* (-1.71)
$Distress1_{it}$	0 (omitted)		0 (omitted)	
$Distress2_{it}$		-0.0015342 (-0.37)		0.0237317 (0.98)
Out_{ijt}	-0.0038917 (-1.13)	-0.0069029** (-2.14)	0.0046888 (0.27)	0.0106433 (0.57)
Control: Acq	Yes	Yes	Yes	Yes
Control: Target	Yes	Yes	Yes	Yes
Control: Deal	Yes	Yes	Yes	Yes
Control: Year Fixed Effect	Yes	Yes	Yes	Yes
Control: Industry Fixed Effect	Yes	Yes	Yes	Yes
Observations	2,230	2,290	2,138	2,198
$Adjusted - R^2$	0.1021	0.1561	-0.0441	-0.0688
Coefficients are listed above and T-statistics are in brackets				
, **, * are 10%,5%,1% confidence level respectively*				

**Of one's own make*

As seen in the table above, when examining the short-term performance, the triple interaction term is significant on a 95 percent confidence level independent of the distress measure. In the second model in column (2) the triple interaction term is even statistically significant on a 99 percent confidence level. The results show that the interaction effects of firm- and industry-level distress has a stronger impact on acquirer returns when the acquirer are from a different industry than the target. Another thing to note is that when including the triple interaction term, the two measures of fire-sales becomes insignificant. The two distress measures are also insignificant. These results suggest that the previous results in hypothesis one and two is highly driven by acquisitions by industry outsiders. These results are consistent with Shleifer & Vishny's (1992) theory of when a fire-sale occurs. An important notice is that the coefficient for industry-level distress is significantly negative in both column (1) and (2). This means that the triple interaction term nor the interaction terms of fire-sale captures the whole effect of industry distress on short-term performance of the acquirer. The coefficient on industry distress would have been insignificant if the effect was captured by the interaction terms mentioned before. Furthermore, the coefficient is, quite surprisingly, significant negative. This suggest that it is not enough for the industry itself to be distressed for a fire-sale to occur. It is actually associated with negative abnormal returns to acquire a non-distressed target in a distressed industry. To gain a significant abnormal return the target has to be distressed.

When looking on the long-term performance one can see that, the triple interaction term is insignificant in both column (3) and (4). This is not consistent with Shleifer & Vishny's (1992) theory where one would expect significantly positive coefficients on long-term.

6.5 Analysis of hypothesis five

The fifth hypothesis investigates the impact of implicit competition within the industry on the price discount:

H_5: *Distressed targets in a distressed industry with low implicit competition are acquired by a higher discount.*

To test the hypothesis above the following regressions are made. The purpose is to investigate the impact of implicit competition on the price discount both on short- and long-term.

$$CAR_{ijdt} = \beta_1 * (Firesale_{it} * Competition_{it}) + \beta_2 * Firesale_{it} + \beta_3 * Competition_{it} + \beta_4 * \ Distress_{it} + \beta_5 * IndustryD_{it} + \ \gamma * X_{ijd} + \alpha_t + \alpha_i + \epsilon_{ijdt}$$

$$BHAR_{ijdt} = \beta_1 * (Firesale_{it} * Competition_{it}) + \beta_2 * Firesale_{it} + \beta_3 * Competition_{it} + \beta_4 * \ Distress_{it} + \beta_5 * IndustryD_{it} + \ \gamma * X_{ijd} + \alpha_t + \alpha_i + \epsilon_{ijdt}$$

As performed in the prior analysis the assumptions of the independent variables will be investigated. In the first column (1) the results obtained when using the first distress measure, $Distress1_{it}$, will be shown. Column (2) will represent the results of the second distress measure, $Distress2_{it}$, on short-term.

Afterwards the long-term performance will be examined. In column (3) test statistics of BHAR with $Distress1_{it}$ measure will be shown. Finally, column (4) will contain the results of the long-term performance when using the second distress measure $Distress2_{it}$.

Table 11 summarizes the test results of the assumptions as described in section 4.6.1. All the results can be found in appendix 14 and 19.

Table 11 - Assumptions of the fifth hypothesis

Assumptions	Conditions	Short-term		Long-term	
		(1)	(2)	(3)	(4)
Assumption 1	Independet residuals	yes	yes	yes	yes
Assumption 2	Linearity	yes	yes	yes	yes
Assumption 3	Normal distribution	no	no	no	no
	Heteroscedasticity	no	no	no	no
Assumption 4	Autocorrelation	no	no	no	no
Assumption 5	Multi collinearity	no	no	no	no

**Of one's own make*

As seen in the table above assumption three to five is not fulfilled on both short- and long-term. This is an immediate weakness for the test. This means that the results shall be interpreted carefully.

The results of the regressions can be seen in the table below:

Table 12 - Results of the fifth hypothesis

Dependent variable	CAR		BHAR	
	(1)	(2)	(3)	(4)
$(Firesale1_{it} * Competition_{it})$	-0.000003310 (-1.43)		-0.000006 (-0.48)	
$(Firesale2_{it} * Competition_{it})$		-0.00000342 (-1.32)		-0.0000129 (-0.88)
$Firesale1_{it}$	0.013848*** (3.60)		0.0071391 (0.37)	
$Firesale2_{it}$		0.0144208** (2.56)		0.0189665 (0.59)
$IndustryD_{it}$	-0.0121038*** (-3.14)	-0.0084282** (-2.41)	-0.0299611 (-1.54)	-0.0346929* (-1.74)
$Distress1_{it}$	0 (omitted)		0 (omitted)	
$Distress2_{it}$		-0.00117430 (-0.28)		0.0239171 (0.99)
$Competition_{it}$	-0.0000003370 (-0.06)	-0.0000006 (-0.11)	-6.14E-06 (-0.23)	-0.0000109 (-0.35)
Control: Acq	Yes	Yes	Yes	Yes
Control: Target	Yes	Yes	Yes	Yes
Control: Deal	Yes	Yes	Yes	Yes
Control: Year Fixed Effect	Yes	Yes	Yes	Yes
Control: Industry Fixed Effect	Yes	Yes	Yes	Yes
Observations	2,230	2,290	2,138	2,198
$Adjusted - R^2$	0.1011	0.1437	-0.044	-0.0688
Coefficients are listed above and T-statistics are in brackets **, **, *** are 10%,5%,1% confidence level respectively*				

**Of one's own make*

When looking on the short-term performance, as described earlier in section 4.5.5, one would expect a negative sign on the coefficient of the triple interaction term. However, these are not significantly different from zero. It is still the interaction term between firm- and industry-level distress there has significant influence on the short-term return of the acquirers. This means that competition is not able to capture competition as a channel of fire-sale to the acquirer.

When examining the long-term performance, the coefficients have still negative signs. The theory suggests that high implicit competition is associated with a lower discount. However, they are insignificant so competition cannot explain price discounts of the targets on long-term either.

6.6 Analysis of hypothesis six

The sixth hypothesis is examining the effect of asset specificity on price discounts on distressed targets. Theoretically, firms with a high degree of asset specificity should be sold at a larger discount in an illiquid market. This is what the following hypothesis covers:

H_6: *Distressed targets in a distressed industry with high asset specificity are acquired by a higher discount.*

To test the hypothesis above the following regressions are made:

$$CAR_{ijdt} = \beta_1 * (Firesale_{it} * AssetSpecificity_{it}) + \beta_2 * Firesale_{it} + \beta_3 * AssetSpecificity_{it} + \beta_4 * Distress_{it} + \beta_5 * IndustryD_{it} + \gamma * X_{ijd} + \alpha_t + \alpha_i + \epsilon_{ijdt}$$

$$BHAR_{ijdt} = \beta_1 * (Firesale_{it} * AssetSpecificity_{it}) + \beta_2 * Firesale_{it} + \beta_3 * AssetSpecificity_{it} + \beta_4 * Distress_{it} + \beta_5 * IndustryD_{it} + \gamma * X_{ijd} + \alpha_t + \alpha_i + \epsilon_{ijdt}$$

As performed in the prior analysis the assumptions of the independent variables will be investigated. In the first column (1) the results obtained when using the first distress measure, $Distress1_{it}$, will be shown. Column (2) will represent the results of the second distress measure, $Distress2_{it}$, on short-term.

Afterwards the long-term performance will be examined. In column (3) test statistics of BHAR with $Distress1_{it}$ measure will be shown. Finally, column (4) will contain the results of the long-term performance when using the second distress measure $Distress2_{it}$.

Table 13 summarizes the test results of the assumptions as described in section 4.6.1. All the results can be found in appendix 14 and 20.

Table 13 - Assumptions of the sixth hypothesis

Assumptions	Conditions	Short-term		Long-term	
		(1)	(2)	(3)	(4)
Assumption 1	Independet residuals	yes	yes	yes	yes
Assumption 2	Linearity	yes	yes	yes	yes
Assumption 3	Normal distribution	no	no	no	no
	Heteroscedasticity	no	no	no	no
Assumption 4	Autocorrelation	no	no	no	no
Assumption 5	Multi collinearity	no	no	no	no

**Of one's own make*

As seen in the table above assumption three to five is not fulfilled on both short- and long-term. This is a immediate weakness for the test. This means that the results shall be interpreted carefully.

Table 14 - Results of the sixth hypothesis

Dependent variable	CAR		BHAR	
	(1)	(2)	(3)	(4)
$(Firesale1_{it} * AssetSpecificity_{it})$	-0.8397684 (-0.58)		-7.588102 (-1.07)	
$(Firesale2_{it} * AssetSpecificity_{it})$		-0.6808261 (-0.49)		-9.201475 (-1.18)
$Firesale1_{it}$	0.0114569*** (3.38)		0.0054273 (0.32)	
$Firesale2_{it}$		0.0120072** (2.28)		0.0128786 (0.43)
$IndustryD_{it}$	-0.0120664*** (-2.34)	-0.0082473** (-2.35)	-0.0321653* (-1.65)	-0.0355033* (-1.78)
$Distress1_{it}$	0 (omitted)		0 (omitted)	
$Distress2_{it}$		-0.001144 (-0.27)		0.0244782 (1.01)
$AssetSpecificity_{it}$	0.2512513 (0.22)	0.2152125 (0.21)	-1.580308 (-0.29)	-2.824154 (-0.50)
Control: Acq	Yes	Yes	Yes	Yes
Control: Target	Yes	Yes	Yes	Yes
Control: Deal	Yes	Yes	Yes	Yes
Control: Year Fixed Effect	Yes	Yes	Yes	Yes
Control: Industry Fixed Effect	Yes	Yes	Yes	Yes
Observations	2,230	2,290	2,138	2,198
$Adjusted - R^2$	0.1003	0.143	-0.0416	-0.0663
Coefficients are listed above and T-statistics are in brackets **, **, *** are 10%,5%,1% confidence level respectively*				

**Of one's own make*

As seen in the table above when examining the short-term effect on the acquirers' returns the triple interaction terms coefficients has a negative sign. This is the opposite of what was expected. However, they are statistically insignificant independent of the distress measure. The results show that the assets illiquidity is not a driver of the fire-sales discount. The fire-sales measures are still significant which suggests that it is the firm- and industry-level distress there drives the fire-sales discount rather than the asset specificity.

When examining the long-term performance of the acquirers return the triple interaction term is again insignificant. Furthermore, the sign of the coefficient is different from what was expected. For asset specificity

to be a channel of fire-sales the coefficients had to be significantly positive. Both results will be discussed in the discussion.

To sum up neither on short- or long-term is there anything in the results there indicates that asset specificity is a channel of fire-sales. These results contradict the theory of Shleifer & Vishny (1992), which predicts that distressed targets in a distressed industry with high asset specificity is being sold with a larger discount in an illiquid market.

6.7 Analysis of hypothesis seven

The purpose of the seventh hypothesis is to examine the impact of an easier access to the equity market and what effect it has on the fire-sales discount. To investigate this the following hypothesis is made:

H_7: *Distressed targets there is unlisted are acquired at a higher discount than distressed targets there are listed.*

This can be tested with the following hypothesis both on short- and long-term:

$$CAR_{ijdt} = \beta_1 * (Distress2_{it} * Unlisted_{it}) + \beta_2 * Distress_{it} + \beta_3 * Unlisted_{it} + \gamma * X_{ijd} + \alpha_t + \alpha_i + \epsilon_{ijdt}$$

$$BHAR_{ijdt} = \beta_1 * (Distress_{it} * Unlisted_{it}) + \beta_2 * Distress_{it} + \beta_3 * Unlisted_{it} + \gamma * X_{ijd} + \alpha_t + \alpha_i + \epsilon_{ijdt}$$

As performed in the prior analysis the assumptions of the independent variables will be investigated. In the first column (1) the results obtained when using the first distress measure, $Distress1_{it}$, will be shown. Column (2) will represent the results of the second distress measure, $Distress2_{it}$, on short-term.

Afterwards the long-term performance will be examined. In column (3) test statistics of BHAR with $Distress1_{it}$ measure will be shown. Finally, column (4) will contain the results of the long-term performance when using the second distress measure $Distress2_{it}$.

Table 15 summarizes the test results of the assumptions as described in section 4.6.1. All the results can be found in appendix 14 and 21.

Table 15 - Assumptions of the seventh hypothesis

Assumptions	Conditions	Short-term		Long-term	
		(1)	(2)	(3)	(4)
Assumption 1	Independet residuals	yes	yes	yes	yes
Assumption 2	Linearity	yes	yes	yes	yes
Assumption 3	Normal distribution	no	no	no	no
	Heteroscedasticity	no	no	no	no
Assumption 4	Autocorrelation	no	no	no	no
Assumption 5	Multi collinearity	no	no	no	no

**Of one's own make*

As seen in the table above assumption three to five is not fulfilled on both short- and long-term. This is an immediate weakness for the test. This means that the results shall be interpreted carefully.

The results of the regression are listed in the table below:

Table 16 - Results of the seventh hypothesis

Dependent variable	CAR		BHAR	
	(1)	(2)	(3)	(4)
$(Distress1_{it} * Unlisted_{it})$	0.2787323***		-0.097207	
	(5.16)		(-0.26)	
$(Distress2_{it} * Unlisted_{it})$		-0.0729778		0.6955789
		(-0.58)		(0.95)
$Distress1_{it}$	0		0	
	(omitted)		(omitted)	
$Distress2_{it}$		0		0
		(omitted)		(omitted)
$Unlisted_{it}$	0	0	0	0
	(omitted)	(omitted)	(omitted)	(omitted)
Control: Acq	Yes	Yes	Yes	Yes
Control: Target	Yes	Yes	Yes	Yes
Control: Deal	Yes	Yes	Yes	Yes
Control: Year Fixed Effect	Yes	Yes	Yes	Yes
Control: Industry Fixed Effect	Yes	Yes	Yes	Yes
Observations	794	768	768	730
$Adjusted - R^2$	0.0685	0.1806	-0.2813	-0.2897
Coefficients are listed above and T-statistics are in brackets				
, **, * are 10%,5%,1% confidence level respectively*				

**Of one's own make*

As seen in the table above, when considering short-term performance, the coefficient on the interaction term in column (1) Is economically large and significant on a 99 percent confidence level. However, the conclusions depend on what distress measure there is used in the tests. Using the second distress measures yields a positive

coefficient but not significantly different from zero as seen in column (2). The alternative hypothesis is confirmed but this result is not robust because it depends on the measure of distress. Keep in mind the number of listed targets. As described in section 5.2.7 there is very few listed targets and even less distressed listed targets. This is weakness for the test and a reason why one should be careful to draw conclusions about how the access to equity markets affects the fire-sales discount based on these tests.

When considering the long-term performance, the interaction term is insignificant. Especially in column 2 the coefficient is economically large but still insignificant. One would expect the signs of the coefficients to be positive. However, the sample is limited when considering distress listed targets. Therefore, one should be careful drawing conclusions based on these results. Such a small sample makes it difficult to draw general conclusions about the European M&A market.

6.8 Analysis of hypothesis eight

The purpose of the eight hypothesis test if equity- and debt market conditions is a channel of fire-sale. The hypothesis is formulated in the following way:

H_8: *Distressed unlisted targets sell at a higher discount when the conditions on the debt- and equity markets makes alternative sources of liquidity more difficult and costly to obtain.*

To investigate the problem a regression will be made to see if there are any statistical relationship between the dependent and independent variables. An overview of the included variables can be seen in section 5.2.8. The regression is formulated on a short- and long-term below:

$$CAR_{ijdt} = \beta_1 * \left(Unlisted_{it} * Distress_{it} * IPO_{vol_t}\right) + \beta_2 * (Unlisted_{it} * Distress_{it} * Spread_t) + \beta_3 * Unlisted_{it} + \beta_4 * IPO_{vol_t} + \beta_5 * Spread_t + \beta_4 * Distress_{it} + \gamma * X_{ijd} + \alpha_t + \alpha_i + \epsilon_{ijdt}$$

$$BHAR_{ijdt} = \beta_1 * \left(Unlisted_{it} * Distress_{it} * IPO_{vol_t}\right) + \beta_2 * (Unlisted_{it} * Distress_{it} * Spread_t) + \beta_3 * Unlisted_{it} + \beta_4 * IPO_{vol_t} + \beta_5 * Spread_t + \beta_4 * Distress_{it} + \gamma * X_{ijd} + \alpha_t + \alpha_i + \epsilon_{ijdt}$$

In the first column (1) the results obtained when using the first distress measure, $Distress1_{it}$, will be shown. Column (2) will represent the results of the second distress measure, $Distress2_{it}$, on short-term.

Afterwards the long-term performance will be examined. In column (3) test statistics of BHAR with $Distress1_{it}$ measure will be shown. Finally, column (4) will contain the results of the long-term performance when using the second distress measure $Distress2_{it}$.

Table 17 summarizes the test results of the assumptions as described in section 4.6.1. All the results can be found in appendix 14 and 22.

Table 17 - Assumptions of the eighth hypothesis

Assumptions	Conditions	Short-term		Long-term	
		(1)	(2)	(3)	(4)
Assumption 1	Independet residuals	yes	yes	yes	yes
Assumption 2	Linearity	yes	yes	yes	yes
Assumption 3	Normal distribution	no	no	no	no
	Heteroscedasticity	no	no	no	no
Assumption 4	Autocorrelation	no	no	no	no
Assumption 5	Multi collinearity	no	no	no	no

**Of one's own make*

As seen in the table above, assumption three to five is not fulfilled on both short- and long-term. This is an immediate weakness for the test. This means that the results should be interpreted with care.

Below is a table with the results of the regression:

Table 18 - Results of the eighth hypothesis

Dependent variable	CAR		BHAR	
	(1)	(2)	(3)	(4)
$(Unlisted_{it} * Distress_{it} * IPO_{vol_t})$	-9E-06	-5E-06	0.0000574	0.0001086
	(-0.73)	(-0.37)	(0.93)	(1.46)
$(Unlisted_{it} * Distress_{it} * Spread_t)$	0.005072	-0.0001002	-0.0054715	0.0230796
	(1.59)	(-0.03)	(-0.34)	(1.25)
$Unlisted_{it}$	0.161008***	0.153754***	-0.2930799	-0.2373923
	(3.84)	(3.79)	(-1.41)	(-1.04)
IPO_{vol_t}	-1.11E-06	-5.96E-06	0.0000181	0.0000588
	(-0.10)	(-0.53)	(0.32)	(0.91)
$Spread_t$	0.0050439	0.0058685	0.0312265	0.0164991
	(1.33)	(1.52)	(1.53)	(0.70)
$Distress1_{it}$	0.0107087		-0.0917999	
	(0.55)		(-0.95)	
$Distress2_{it}$		0.013829		-0.183903
		(0.67)		(-1.57)
Control: Acq	Yes	Yes	Yes	Yes
Control: Target	Yes	Yes	Yes	Yes
Control: Deal	Yes	Yes	Yes	Yes
Control: Year Fixed Effect	Yes	Yes	Yes	Yes
Control: Industry Fixed Effect	Yes	Yes	Yes	Yes
Observations	2,213	2,273	2,133	2,193
$Adjusted - R^2$	0.1087	0.1504	-0.0444	-0.0668
Coefficients are listed above and T-statistics are in brackets				
, **, * are 10%,5%,1% confidence level respectively*				

**Of one's own make*

Taking the results into consideration the null hypothesis is accepted on all four tests. All the test results are insignificant on all confidence levels. This means that the model cannot prove any relationship between the market condition and the fire-sales discount of distress targets on both short- and long-term. The results are surprising because the theory suggest that bad markets and a high credit spread should worsen the bargain power of the target. This should result in higher wealth transfer to the acquirer on both event windows. This will be discussed further in the discussion.

The variable, $Unlisted_{it}$, is significant on a 99 confidence level on both measures on the short-term. This indicates that unlisted targets are positive associated with the performance of the acquirer. A reason for this result can be the illiquidity premium the acquirer is harvesting because of illiquid shares.

6.9 Analysis of hypothesis nine

The ninth analysis is considering if crisis is having an impact in determining the targets acquisition discount. The hypothesis is formulated in the following way:

H_9: *Distressed targets are acquired at a higher discount in distressed times.*

To investigate if crisis is having an effect a multiple regression will be used to test the relationship.

$$CAR_{ijdt} = \beta_1 * (Distress_{it} * Crisis_t) + \beta_2 * Crisis_t + \beta_3 * Distress_{it} + \gamma * X_{ijd} + \alpha_t + \alpha_i + \epsilon_{ijdt}$$

$$BHAR_{ijdt} = \beta_1 * (Distress_{it} * Crisis_t) + \beta_2 * Crisis_t + \beta_3 * Distress_{it} + \gamma * X_{ijd} + \alpha_t + \alpha_i + \epsilon_{ijdt}$$

The different parameters are mentioned and specified in section 5.2.9. Once again, the two distress measures are both tested to ensure a robustness in the findings.

As performed in the prior analysis the assumptions of the independent variables will be investigated. In the first column (1) the results obtained when using the first distress measure, $Distress1_{it}$, will be shown. Column (2) will represent the results of the second distress measure, $Distress2_{it}$, on short-term.

Afterwards the long-term performance will be examined. In column (3) test statistics of BHAR with $Distress1_{it}$ measure will be shown. Finally column (4) will contain the results of the long-term performance when using the second distress measure $Distress2_{it}$.

Table 19 summarizes the test results of the assumptions as described in section 4.6.1. All the results can be found in appendix 14 and 23.

Table 19 - Assumptions of the ninth hypothesis

Assumptions	Conditions	Short-term		Long-term	
		(1)	(2)	(3)	(4)
Assumption 1	Independet residuals	yes	yes	yes	yes
Assumption 2	Linearity	yes	yes	yes	yes
Assumption 3	Normal distribution	no	no	no	no
	Heteroscedasticity	no	no	no	no
Assumption 4	Autocorrelation	no	no	no	no
Assumption 5	Multi collinearity	no	no	no	no

**Of one's own make*

As seen in the table above, assumption three to five is not fulfilled on both short- and long-term. This is an immediate weakness for the test. This means that the results shall be interpreted carefully.

The results of the test can be seen in the table below.

Table 20 - Results of the ninth hypothesis

Dependent variable	CAR		BHAR	
	(1)	(2)	(3)	(4)
$(Distress_{it} * Crisis_t)$	0.0256809***	0.0139942**	0.0089394	-0.0150735
	(3.79)	(1.99)	(0.26)	(-0.37)
$Crisis_t$	0.0013689	0.0036166	-0.0311861	-0.0211953
	(0.17)	(0.43)	(-0.70)	(-0.42)
$Distress1_{it}$	0.0024048		-0.0121146	
	(0.80)		(-0.80)	
$Distress2_{it}$		0.0043147		0.0308728**
		(1.58)		(1.97)
Control: Acq	Yes	Yes	Yes	Yes
Control: Target	Yes	Yes	Yes	Yes
Control: Deal	Yes	Yes	Yes	Yes
Control: Year Fixed Effect	Yes	Yes	Yes	Yes
Control: Industry Fixed Effect	Yes	Yes	Yes	Yes
Observations	2,230	2,290	2,138	2,198
$Adjusted - R^2$	0.1037	0.1424	-0.0447	-0.0696
Coefficients are listed above and T-statistics are in brackets				
, **, * are 10%,5%,1% confidence level respectively*				

**Of one's own make*

When examining the short-term the first interaction term in column (1) is significant on a 99 percent confidence level. The interaction term in the second model as seen in column (2) is significant on a 95 percent confidence

level. This is aligned with the expectation of this study since it shows that when a distressed target is sold during a crisis it is sold at a further discount. The two measures of distress are insignificant. Remember the results in the first hypothesis where the coefficients on both distress measures was significant. Now they are insignificant, which implies that it is not distress itself there drives the discount but also the economic conditions of the surroundings as seen from the results in hypothesis two and this hypothesis.

Taking the coefficient into consideration in column (1), one can see that a distress acquisition during a crisis contribute to an abnormal gain of 2.57 percent relatively to the other acquisitions in the sample. The coefficient in column (2) is economical smaller but still significantly positive. The average abnormal gain for an acquirer is in this model is 1.14 percent when a distressed firm is acquired during a crisis relatively to the other acquisitions in the sample.

On the long-term the interaction terms are insignificant. Acquirering a distressed target during a crisis period is not associated with abnormal performance. However, the second distress measure is significant, as seen in column (4). Why one could gain abnormal returns by acquiring a distressed target. It is quite surprising since the distress measure have been insignificant on long-term in all the previous hypotheses. Why one should not put too much weight on this finding.

The coefficient of determination is negative here in this case. The reason for this might be that there are too many independent variables with small explanatory power.

6.10 Analysis of hypothesis ten

The tenth hypothesis is aiming to find out if the degree of prior merger experience is a deterministic factor for wealth gain to the acquirer when acquiring a distressed target.

H_{10}: *Distressed targets acquired by an experienced firm are associated with higher wealth gain for the acquirer.*

To find out if merger experience is having an effect a multiple regression will be performed. The test will be conducted on a short- and long-term.

$$CAR_{ijdt} = \beta_1 * \left(Distress_{it} * \ Experience_{jt}\right) + \ \beta_2 * Distress_{it} + \beta_3 * Experence_{jt} + \ \gamma * X_{ijd} + \alpha_t + \alpha_i + \epsilon_{ijdt}$$

$$BHAR_{ijdt} = \beta_1 * \left(Distress_{it} * \ Experience_{jt}\right) + \ \beta_2 * Distress_{it} + \beta_3 * Experence_{jt} + \ \gamma * X_{ijd} + \alpha_t + \alpha_i + \epsilon_{ijdt}$$

As performed in the prior analysis the assumptions of the independent variables will be investigated. In the first column (1) the results obtained when using the first distress measure, $Distress1_{it}$, will be shown. Column (2) will represent the results of the second distress measure, $Distress2_{it}$, on short-term.

Afterwards the long-term performance will be examined. In column (3) test statistics of BHAR with $Distress1_{it}$ measure will be shown. Finally, column (4) will contain the results of the long-term performance when using the second distress measure $Distress2_{it}$.

Table 21 summarizes the test results of the assumptions as described in section 4.6.1. All the results can be found in appendix 14 and 24.

Table 21 - Assumptions of the tenth hypothesis

Assumptions	Conditions	Short-term		Long-term	
		(1)	(2)	(3)	(4)
Assumption 1	Independet residuals	yes	yes	yes	yes
Assumption 2	Linearity	yes	yes	yes	yes
Assumption 3	Normal distribution	no	no	no	no
	Heteroscedasticity	no	no	no	no
Assumption 4	Autocorrelation	no	no	no	no
Assumption 5	Multi collinearity	no	no	no	no

**Of one's own make*

As seen in the table above, assumption three to five is not fulfilled on both short- and long-term. This is an immediate weakness for the test. This means that the results shall be interpreted carefully.

The results of the tests are stated below in the table.

Table 22 - Results of the tenth hypothesis

Dependent variable	CAR		BHAR	
	(1)	(2)	(3)	(4)
$(Distress_{it} * Experience_{jt})$	-0.0000186 (-0.16)	-0.0000418 (-0.43)	0.0005553 (0.95)	-0.0001428 (-0.26)
$Experence_{jt}$	-0.0000193 (-0.27)	-0.0000139 (-0.18)	-0.0002685 (-0.76)	-0.0000665 (-0.15)
$Distress1_{it}$	0.0060563* (1.68)		-0.0196069 (-1.15)	
$Distress2_{it}$		0.0062514** (2.43)		0.0290171** (2.84)
Control: Acq	Yes	Yes	Yes	Yes
Control: Target	Yes	Yes	Yes	Yes
Control: Deal	Yes	Yes	Yes	Yes
Control: Year Fixed Effect	Yes	Yes	Yes	Yes
Control: Industry Fixed Effect	Yes	Yes	Yes	Yes
Observations	2,230	2,290	2,138	2,198
$Adjusted - R^2$	0.0959	0.1404	-0.0444	-0.0697
Coefficients are listed above and T-statistics are in brackets **, **, *** are 10%,5%,1% confidence level respectively*				

**Of one's own make*

On the short-term the null hypothesis is accepted. This means that merger experience does not have any significant effect on distressed acquisitions. Neither do stand-alone experience on the short-term performance. This is the opposite of what was expected. The theory was suggesting that the acquirer could use prior experience to excel in acquisition both with distressed and regular acquisitions.

The two distress measures (1) and (2) is significant on respectively 90 and 95 percent confidence level on short-term. This was also to be expected because of the prior results in the analysis.

On the long run the null hypothesis is also accepted. By accepting the null hypothesis, there cannot be showed any effect on both the stand-alone experience and the interaction term between experience and firm-level distress. The second distress measure is significant on a 95 percent confidence level which, means that acquirers on average earns an abnormal return in the next four month by acquiring a distressed firm. However, it is only on the second distress measure why this result is not robust.

The findings in this test was the opposite of what the study was expecting to document, this will be discussed further in the discussion.

6.11 Analysis of hypothesis eleven

The eleventh analysis is considering the last hypothesis. The hypothesis is trying to clarify if the relative size has an impact on the acquirers performance measure. The hypothesis is formulated in the following way:

H_{11}: *Distressed targets acquired by a relatively larger firm are associated with higher wealth transfer to the acquirer*

To test this hypothesis a regression can be set up as below:

$$CAR_{ijdt} = \beta_1 * \left(Distress_{it} * Size_{ijt}\right) + \beta_2 * Size_{ijt} + \beta_3 * Distress_{it} + \gamma * X_{ijd} + \alpha_t + \alpha_i + \epsilon_{ijdt}$$

$$BHAR_{ijdt} = \beta_1 * \left(Distress_{it} * Size_{ijt}\right) + \beta_2 * Size_{ijt} + \beta_3 * Distress_{it} + \gamma * X_{ijd} + \alpha_t + \alpha_i + \epsilon_{ijdt}$$

The different parameters are mentioned and specified in section 5.2.11. Once again, the two distress measures are both tested to ensure a robustness in the findings.

As performed in the prior analysis the assumptions of the independent variables will be investigated. In the first column (1) the results obtained when using the first distress measure, $Distress1_{it}$, will be shown. Column (2) will represent the results of the second distress measure, $Distress2_{it}$, on short-term.

Afterwards the long-term performance will be examined. In column (3) test statistics of BHAR with $Distress1_{it}$ measure will be shown. Finally, column (4) will contain the results of the long-term performance when using the second distress measure $Distress2_{it}$.

Table 23 summarizes the test results of the assumptions as described in section 4.6.1. All the results can be found in appendix 14 and 25.

Table 23 - Assumptions of the eleventh hypothesis

Assumptions	Conditions	Short-term		Long-term	
		(1)	(2)	(3)	(4)
Assumption 1	Independet residuals	yes	yes	yes	yes
Assumption 2	Linearity	yes	yes	yes	yes
Assumption 3	Normal distribution	no	no	no	no
	Heteroscedasticity	no	no	no	no
Assumption 4	Autocorrelation	no	no	no	no
Assumption 5	Multi collinearity	no	no	no	no

**Of one's own make*

As seen in the table above, assumption three to five is not fulfilled on both short- and long-term. This is an immediate weakness for the test. This means that the results shall be interpreted carefully.

The regression is carried out and the results of the tests can be seen below:

Table 24 - Results of the eleventh hypothesis

Dependent variable	CAR		BHAR	
	(1)	(2)	(3)	(4)
$(Distress_{it} * Size_{ijt})$	-0.0001169	-0.0001012	0.0006498	0.0005913
	(-0.42)	(-0.41)	(0.45)	(0.40)
$Size_{ijt}$	-0.0000972	-0.0000883	0.0005841	0.0004477
	(-0.81)	(-0.70)	(0.95)	(0.60)
$Distress1_{it}$	0.0060826*		-0.0124546	
	(1.89)		(-0.73)	
$Distress2_{it}$		0.0059235**		0.0252735
		(2.12)		(1.48)
Control: Acq	Yes	Yes	Yes	Yes
Control: Target	Yes	Yes	Yes	Yes
Control: Deal	Yes	Yes	Yes	Yes
Control: Year Fixed Effect	Yes	Yes	Yes	Yes
Control: Industry Fixed Effect	Yes	Yes	Yes	Yes
Observations	1,879	1,924	1,797	1,842
$Adjusted - R^2$	0.1747	0.2175	-0.0523	-0.0884
Coefficients are listed above and T-statistics are in brackets				
, **, * are 10%,5%,1% confidence level respectively*				

**Of one's own make*

The above results are suggesting that the null hypothesis is accepted. All of the interaction terms between size and firm-level distress on short- and long-term are all insignificant on all confidence levels. This means that the study cannot draw a relationship between an acquirers' performance and the relative size of the firms. This is a

bit surprising because the theory is suggesting that larger firm should be better suited to integrate smaller firms and being able to provide sufficient slack to get the firm back on track. The results will be further discussed in chapter 7. On short-term the first and second distress measure is significant on a 90 percent and 95 percent confidence level, respectively. This means that the acquirer captures a gain but the relative size of the firms is not able to explain it.

6.12 Alternative tests

In all the hypotheses, when considering long-term, the key independent variables have been insignificant. A major concern is that the four month event window used for long-term performance is too short. Integrate a firm is a long and demanding process. Why it could easily take more than four month for the acquirer to fully exploit the synergies. The rationale for choosing a smaller event window to measure long-term performance was because of data constraints on some of the hypothesis. It was especially on the hypothesis, which required to distinguish between listed and unlisted targets.

To eliminate this major criticism a longer event window has been used to test the hypothesis on long-term. A two year window has been applied which is a common length used in event studies testing long-term performance (e.g. Ikenberry et al., 2002; Oh, 2014).

As seen in appendix 26 applying a longer event window does not change any conclusions in this paper since all hypothesis is insignificant on a 95 percent confidence level. Because of that, the critique of the event window will not be examined further in this paper since it does not make a difference on the results.

6.13 Sub-conclusion

The findings in the analysis is represented in the table below:

Table 25 - Summary of findings

Hypothesis (H)	CAR		BHAR		Probit	
	(1)	(2)	(3)	(4)	(1)	(2)
H1: *Distressed targets are acquired at a higher discount.*	✓	✓	×	×		
H2: *Distressed targets are acquired at a higher discount when their industry is distressed.*	✓	✓	×	×		
H3: *Distressed targets in distressed industries are more likely to be acquired by outsiders.*					×	×
H4: *Distressed targets in distressed industries are acquired by a higher discount when it is bought of an industry insider compared to an industry outsider.*	✓	✓	×	×		
H5: *Distressed targets in a distressed industry with low implicit competition are acquired by a higher discount.*	×	×	×	×		
H6: *Distressed targets in a distressed industry with high asset specificity are acquired by a higher discount.*	×	×	×	×		
H7: *Distressed targets there is unlisted are acquired at a higher discount than distressed targets there are listed.*	✓	×	×	×		
H8: *Distressed unlisted targets sell at a higher discount when the conditions on the debt- and equity markets makes alternative sources of liquidity more difficult and costly to obtain.*	×	×	×	×		
H9: *Distressed targets are acquired at a higher discount in distressed times.*	✓	✓	×	×		
H10: *Distressed targets acquired by an experienced firm are associated with higher wealth transfer to the acquirer.*	×	×	×	×		
H11: *Distressed targets acquired by a relatively larger firm are associated with higher wealth transfer to the acquirer.*	×	×	×	×		

**Of ones own make. (Conclusions are based on a 95 percent confidence level)*

The study could conclude that when acquiring a distressed target in Europe it was associated with an average abnormal gain of 0.058 percent and 0.062 percent depending on distress measure compared to acquiring a non-distressed target.

It was shown that industry distress resulted in a deeper discount when buying a distressed firm. This was one of the properties proposed by Shleifer & Vishny (1992). Furthermore, another implication of the model was that

acquirer identity was a fire-sales channel. The study was able to show that acquirer identity was deterministic for discounts of distressed targets, which resulted in a wealth transfer to the acquirer. However, the study was not able to show that firm- and industry-level distress increased the probability for a target to be acquired by an industry outsider.

Another finding was that unlisted distressed targets were sold at a higher discount. This shows that the illiquidity of unlisted targets and a difficult access to the equity market was a property, which could help explain why distressed targets are sold at a discount that resulted in a wealth transfer to the acquirer. However, these results were not robust because the findings were only significant on one of the distress measures.

At last, the study was able to find that general distress was a property, which influenced the discount of distressed targets and resulted in a wealth transfer to the acquirer. This was also an implication of Shleifer & Vishny's (1992) model. The theory stated that the general market liquidity is a fire-sales channel.

The study could conclude that these findings was only existing on short-term. It could not be shown that the above discounts of the target were present on long-term. Even though the market saw the acquisition of a distressed target as a positive signal compared to acquisitions of non-distressed targets. The acquirer could not gain any abnormal performance on long-term.

Another implication of Shleifer & Vishny's (1992) theory was that the number of potential buyers within the industry should have a significant influence on the discount of the target. This study could not show any evidence that supports this property as a fire-sales channel on both short- and long-term.

The specificity of the assets was also examined as a potential property, which could help explain the discounts of distressed targets. The study could not find any evidence to support this theory stated by Williamson (1988) and Shleifer & Vishny (1992) on both short- and long-term.

The study neither found evidence that supported equity- and debt market conditions as influential properties on the price discount on short- and long-term.

Finally, acquirer characteristics, which could potentially give a larger wealth transfer to the acquirer, was examined. The study could not provide results there supported these hypotheses.

7 Discussion

This section will contain the discussion of all the results found in chapter 6. The results will be discussed up against theories and related empirical studies. At last the discussion will come up with some practical implications in order to discuss how the findings affect the real world.

7.1 Discussion of hypothesis one

The first hypothesis was examining whether distressed firms were sold at a discount compared to non-distressed firms. As seen in table 4 the hypothesis was confirmed on short-term and rejected on long-term. The acquirers gained on average a significant larger abnormal return compared to acquirers of non-distressed firms. These findings show a wealth transfer from the target to the acquirer. However, this result can be driven by many other factors than just the fact that the firm itself is distressed, which will be discussed in a later section. There is no significant abnormal performance on long-term. When a company buys a distressed firm, the market will be skeptical because acquirering a distressed firm is a complex task. One could argue that a firm on the edge of bankruptcy is subject to poor management. Why a motive could be to gain corporate control and exploit managerial synergies by replacing existing managers. Efficiency gains through economics of scope can also be attractive to an acquirer regardless of how the target has been performing in the past. If engaging in a horizontal merger the motive for the acquisition can be to gain larger market shares and increase market power. On the other hand, it can also be a costly task to exploit the synergies and make a turnaround. The results could indicate that the market see the motive behind the acquisition as one of the value increasing theories, as described in section 2.1.1, since there is significant abnormal announcement returns. However, on the long-term there is no significant abnormal performance compared to acquisitions of non-distressed targets. These results suggest that acquirers are not able to earn an abnormal return when buying distressed firms. This could indicate that both the market and the management of the acquirer underestimates the costs associated with exploiting the synergies. Misjudgment about cost of exploiting synergies is common in normal acquisitions (Roll, 1986). When a target faces financial distress, it is definitely not always an easier task. Furthermore, when buying a distressed firm there is a possibility of acquiring a highly undervalued firm, but there is also a big risk of buying a pig in a poke. The element of asymmetric information between the acquirer and the target makes it difficult to see in advance whether the deal will be successful or not. This could also be an explanation for the lack of long-term abnormal gains. These results are consistent with Khatami et al. (2015) which also found abnormal gains to the acquirers when acquirering financial constrained targets.

7.2 Discussion of hypothesis two

The second hypothesis was trying to find out whether an acquisition of a distressed target in a distress industry would result in assets being sold below their fundamental value. Hence, the acquirer will earn a positive abnormal return on short- and long-term. The study found that when the industry and target both are distressed the acquisition will on average have a positive influence on short-term wealth transfer to the acquirer. This is consistent with the predictions of Shleifer & Vishny (1992), which suggests that a fire-sale is costly and will be increased even further when the industry is also distressed. The reason is that when the industry is constrained the potential buyers cannot afford such an investment. This is also consistent with other empirical studies (Bruton et al., 1994; Meier & Servaes, 2015; Oh, 2014). The findings suggest that there is a fire-sale discount. Firm- and industry-level distress should not have a significant impact on acquirer returns, if they were bought at a fair market value. Bruton et al. (1994) have only focused on the loss suffered by the targets shareholders. The results in this paper, Meier & Servaes (2015) and Oh (2014) indicates a wealth transfer from the target to the acquirer when both the firm and industry faces distress. From a society perspective this shows that there is a lower welfare loss than expected, because the fire-sale was only examined from the targets point of view. These results show that some of the welfare loss is distributed to the acquirer.

However, the study could not show a significant relationship between fire-sale discounts and acquirer long-term performance. This indicates that the wealth transfer is only on short-term, whereas the study could not show any difference in acquirer performance when engaging in fire-sale acquisition compared to non fire-sale acquisitions. These results contradict the findings of Oh (2014), because he finds a positive relationship between fire-sale acquisitions and long-term performance. An explanation could be that the model of estimating the returns are the same but the methodology to measure long-term performance are different. Oh (2014) are using matching firms to estimate BHAR, while this study is using an equally weighted European index. This could potentially bias the results because Oh's approach might be more accurate because he finds an individual peer for each observation, while this study uses the same index as benchmark for all observations. An alternative explanation can be that fire-sale discount are not present on the European market on long-term while only a short-term gain can be achieved with certainty.

It is important to emphasize that the industry coefficients are significant negative on short-term. This means that the industry is having a negative impact on acquirer performance without the presence of firm-level distress. When engaging in a distressed acquisition there are two driving forces. The first is that when a firm is buying into a distressed industry it will be met with high skepticism from the market. An explanation could be that they might

find it hard to justify the rationale behind the investment in a poorly performing industry. On the other hand, there is a possibility of making a great deal, because the firm can acquirer the target with a huge discount. The results in this study implies that the first force is the most dominant, because the market on average reacts negatively on such announcements on the European market. This sets the scene for criticism of Shleifer & Vishny's (1992) theory. They do not account for how the market perceive the acquisition. This could potentially be included in an extension of their theory.

One interesting finding is that both distress measures becomes insignificant when introducing industry distress. A reason is that the fire-sale interaction term is capturing the full effect of why acquirers gain on fire-sale acquisitions. This means that the findings in the latter hypothesis is highly driven by acquisitions in distressed industries.

7.3 Discussion of hypothesis three

The third hypothesis was testing the probability of a distressed firm in a distressed industry being acquired by an industry outsider. The study was unable to show a significant relationship between the acquirer identity and the firm- and industry-level distress. The findings oppose the theory of Shleifer & Vishny (1992), which suggests that when firm- and industry-level distress is present the acquirer is more likely to be an outsider. This is one of the implications of the model that the study cannot confirm. The findings in this study contradicts with Oh (2014), which found a link between the acquirer identity and the industry-level distress. He neither found a link between acquirer identity and firm-level distress. To wrap it up this study was not able to show that when a firm is distressed the industry peers are not able to purchase the target themselves.

7.4 Discussion of hypothesis four

The fourth hypothesis was testing whether the price discount differs if an outsider is engaging in a fire-sale acquisition. As earlier defined, a fire-sale acquisition is when firm- and industry-level distress is present. The results show that when an outsider engages in a fire-sale acquisition the target will be acquired at a discount on the short-term. The reason why this is considered as a discount is that wealth transfer to the acquirer. If the target was bought at a fair market value both the acquirer identity and the firm- and industry-level distress should not have a significant impact on the acquirers return.

In the latter hypothesis, the study could not find a significant larger probability of an outsider engaging in a fire-sale acquisition. This means that when fire-sale occurs there is no statistical evidence of the assets being pushed to outsiders. This hypothesis can only show that when an outsider engages in a fire-sale acquisition there is a

discount because the assets are being allocated to a lower value user. When selling to a lower value user there is a welfare loss for the society, which is supporting Shleifer & Vishny's (1992) theory. However, this welfare loss might not be as large as earlier expected, from studies only considering the fire-sales discount from a target point of view, because some of the welfare loss is transferred to the acquirer. These findings are consistent with Oh (2014), which finds that it is due to a weakened bargain power of the target that the industry outsiders gains an abnormal return.

An important notice is that both fire-sale measures and the firm-level distress measures becomes insignificant when including the triple interaction term. This suggests that the triple interaction term captures the effect from firm- and industry-level distress. This indicates that the results in the first and second hypothesis were largely driven by acquirer identity. This supports the acquirer identity as a fire-sales channel proposed by Shleifer & Vishny (1992).

When looking on the long-term performance of the acquirers all independent variables are insignificant. This suggests that acquirers cannot obtain abnormal performance in the long-run by engaging in fire-sales acquisitions outside their own industry.

7.5 Discussion of hypothesis five

The fifth hypothesis is testing if implicit competition is having an impact on fire-sale discount. The test could not show any support for that on short-term. This means that fire-sale is not significantly affected by the degree of competition in the industry. Intuitively a higher competition will result in a potentially larger amount of high valuation buyers. A buyer inside the industry would have a higher fundamental valuation of the firms assets, which would result in a lower discount because they can utilize the assets closer to the value in best use. However, an implication of Shleifer & Vishny's (1992) theory is that when the target and industry both are distressed, industry insider are not able to buy these assets. As seen in the latter hypothesis the fire-sale discount was driven by industry outsider engaging in fire-sale acquisitions. The results in this test supports the findings in the latter hypothesis even further because the amount of potential buyer inside the industry do not affect the price discount. It is important to emphasize that the fire-sale coefficient is still significant. This provides further evidence for that the fire-sales discount is primarily driven by industry outsiders as shown in section 6.4.

The findings in this paper contradicts with Meier & Serveas (2015). They find that low implicit competition resulted in a higher discount when the target faced financial distress. However, they were not testing the impact of industry-level distress, which limits the numbers of buyers within the industry, there actually is able to buy

the target. Intuitively, the number of industry peers should then have an even stronger effect on the fire-sales discount when the industry faces distress. The results in this paper could indicate that the industry insiders are simply not in a position to buy the targets because of troubles in the industry.

7.6 Discussion of hypothesis six

The purpose of the sixth hypothesis was to test if asset specificity was deterministic for fire-sale discount. The results show that on both short- and long-term there was no evidence for this. The findings contradict both Shleifer & Vishny's (1992) and Williamson's (1988) predictions that assets with a high degree of specificity should be sold at a higher discount. Assets with a high degree of specificity has low redeployability, which should theoretically give a higher fire-sale discount because they have fewer alternative uses. So far, the results have primarily been driven by fire-sales acquisitions from outsiders. Why it intuitively also would make sense that this study also found evidence for that asset specificity was a fire-sales channel. However, this is not the case. One possible explanation could be the proxy for asset specificity. This study has used patents, which is a product of R&D expenses. Even though earlier studies found significant relationship between R&D expenses and patents this does not seems to be the case on the European market. One could argue that the model set up in this study simply are not measuring the right thing. Number of patents can vary a lot across different industries and does not necessarily measure the costs associated with developing the patents. The software industry tends to have a high number of patents, whereas the pharmaceutical industry usually has a relatively lower number of patents. This could be misleading because the pharmaceutical industry also has high R&D expenses in general. In this case the number of patents do not serve as a good proxy for R&D. Another explanation could simply be that asset specificity is not a fire-sales channel on the European market. The insignificant findings are not only opposing the theory but also the evidence found by Kim (2018) and Oh (2014).

7.7 Discussion of hypothesis seven

The purpose of the seventh hypothesis was to test if the bargain power of unlisted targets is reduced because of their need for liquidity and severe availability to alternative sources of liquidity. The unlisted targets are compared to listed targets, which also have liquidity needs. This is expected to result in a fire-sale discount. When examining short-term, the first model shows a large and significant discount. This shows that the bargain power of the target is weakened if it is unlisted and financial constrained compared to listed target, which have easier access to alternative funding. This finding is consistent with Officer (2007), which also found a significant discount of unlisted distressed targets compared to listed distressed targets.

The findings is also consistent with Kim (2018) there finds that access to external financing resulted in a higher fire-sales discount.

The study could not find any relationship between long-term performance and the easier access to alternative funding. However, the results are not robust at all since there is a very low amount of distressed listed targets. This is a major weakness of the study. Furthermore, the dummy variables for distress and unlisted is omitted due to high multi collinearity. The problem with multi collinearity arises because of the small sample size. There is not enough variation in the sample. Only one percent of the targets are listed as seen in figure 12 so the interaction term is measuring 99 percent of the same as the two dummy variables. Because of that, the significant coefficient can simply just be a result of pure distress as seen in the analysis in section 6.1. The unlisted dummy has a significant coefficient in the analysis in section 6.8. This means it is hard to say if it is the interaction term that drives the fire-sales discount or one of the two stand-alone variables.

7.8 Discussion of hypothesis eight

The eight hypothesis is testing how the conditions on the debt- and equity market are affecting the fire-sale discount. One would expect that when it is difficult and costly to raise alternative sources of funding then the bargaining power of the target is decreasing. The results reveal that this is not the case. The coefficients on the triple interaction terms and the stand-alone measures for debt- and equity market conditions are insignificant. This means that the market conditions do not serve as a fire-sales channel. This hypothesis, have to the writers best knowledge never been tested before. However, Officer (2007) finds that the debt market conditions has an impact on the discount of unlisted targets. Intuitively, this need for liquidity is even stronger for distressed unlisted targets why one would have expected to find similar or even stronger evidence for this.

The findings also contradict with Kim (2018), which finds that access to external financing is deterministic for the price discount of the target. The methodological approach to this hypothesis has a major weakness. The proxy used for debt market conditions are from a different market than the sample firms. This is of course an immediate bias since the European debt market is not perfectly correlated with the US debt market. However, it serves as a reasonable proxy since it is by far the largest in the world.

7.9 Discussion of hypothesis ninth

The ninth hypothesis is testing whether financial crisis is deepening fire-sale discounts. The rationale behind this hypothesis is that the market becomes illiquid during a crisis. Illiquidity is according to Shleifer & Vishny (1992) the major factor for a fire-sale to occur. They also predict that the discount is even larger in periods of general

distress. The findings of this study support the predictions of Shleifer & Vishny (1992) where both the short-term models have significant coefficients on the interaction term between firm-level distress and crisis periods. This means that targets are sold at a significant discount during periods of crisis. As seen in table 20 there is a wealth transfer to the acquirer. If the target were sold at its fair market value, firm-level distress and general distress should not have a significant impact on the acquirer return. Intuitively when a crisis strikes there is a higher possibility for that a higher value buyer is also financially constrained. The assets will then be allocated to a buyer with a lower fundamental value of the assets, which results in a deeper fire-sales discount. These findings are consistent with Ang & Mauck (2011), which also finds significant positive short-term performance of the acquirers' when acquiring a distressed target during a crisis compared to other deals in crisis and non-crisis periods. Ang & Mauck's (2011) findings on the US market and this study's findings on the European market suggests that the market perceives the acquisitions of distressed targets in a crisis period as more favorable compared to in a non-crisis period and acquisitions of non-distressed targets.

An important notice is that both the crisis- and distress variable are insignificant. This means that the interaction term captures the effects from the variables.

When examining the long-term performance of the acquirers the study cannot find any significant abnormal performance on the European market. This suggests that acquirers cannot obtain abnormal performance in the long-term by engaging in acquisitions of distressed targets during a crisis. The findings of this study on the European market is consistent with the findings of Ang & Mauck (2011) on the US market. They could neither find empirical evidence for abnormal long-term performance.

7.10 Discussion of hypothesis ten

The purpose of this hypothesis was to test if acquirer experience had a significant impact on fire-sales discount. The study did not find any evidence that acquirers, with more acquisition experience, could gain an abnormal return by buying a distressed target on both short- and long-term. Previous studies, which have examined the impact of acquirer experience on merger outcome, found evidence that there is significant relationship between experience and acquisition success (Fowler & Schmidt, 1989; Paine & Power, 1984). However, these studies did examine mergers in general and did not account for firm-level distress. The results in this study contradicts the findings of Bruton et al. (1994) they found evidence for that engaging in distressed acquisitions resulted in significant abnormal performance when the acquirer had more experience.

The results in this study suggests that the management cannot use their skills obtained through prior experience, to make a turnaround of the distressed target, and gain abnormal performance compared to buying non-distressed target.

7.11 Discussion of hypothesis eleven

The eleventh hypothesis was testing if the relative size between the acquirer and the target was affecting the acquirer performance on short- and long-term. The rationale behind the hypothesis is that engaging in a distressed acquisition is a complex task. It is a complex tax because the target needs sufficient slack resources as cash, borrowing capacity and attention from the management in order to make a successful turnaround. However, the study could not find any evidence to support this. The relative size did not have any significant effect on both the short- and long-term. This suggests that just because the acquirer can provide the necessary resources it do not mean that they have the abilities to make the turnaround and get an abnormal performance. These findings are consistent with Bruton et al. (1994), which also did not find at significant relationship between relative size and acquisition performance.

7.12 Practical implications

The discussion above also leads to some food for thought for both government and industry. The findings have practical implications for both policy makers, managers of firms and managers who are engaging in acquisitions. The discussion is aiming to provide some guidance for future decision making.

7.12.1 Policy makers

The results show that when a fire-sale is happening, and a firm is being sold to an outsider, there is a welfare loss for the society. This welfare loss can be hindered if there in the distressed industry is a healthy firm with capacity to purchase the troubled firm. If such a deal went through the welfare loss will be lesser than if an outsider was purchasing the firm. This is not always an option because the antitrust law, which purpose is to secure fair competitive environment, might prohibit such action. This means that the law opposes what potentially would be in the interest of the society. On the other hand, as described in section 2.2, if a firm is gaining too much market power in the industry, monopoly likely conditions will arise, which creates a welfare loss. Based on these thoughts it is important for the policy makers to remember that it is a trade-off between two types of welfare losses. They need to balance the welfare loss from fire-sale and monopoly for the good of the society.

Another result found in the paper also address that there is a welfare loss for the society when distressed assets gets allocated to a buyer there has a lower fundamental value of the assets than in best use. This gives some

concerns for the policy makers because this can have implications on how they could shape the insolvency law in the future. This papers primarily focus is on the European market. Because of that, some practical implications for the European Union will be stated. A lot of the deals happens within the union or in countries which are closely working together with the union. This makes it relevant to give some recommendations for some extensions to the insolvency law in EU. The insolvency law has moved a lot in the recent years. Before May 2015, and the recast of the EU Insolvency Regulation 2015/848, there was roughly speaking 28 different insolvency laws in Europe. Many of the national laws offered few other alternatives than liquidation (Mangelli, 2016). The results found in this paper shows that liquidation is not always the optimal result, as it would result in assets being sold at a discount. This suggests that liquidation or selling assets as a part of a restructuring process is not the optimal solution. The new EU Insolvency regulation is now closer to the US chapter 11 bankruptcy code (Mangelli, 2016). The chapter 11 bankruptcy codes build on the understanding of that a preservation of a firms operations give a lower welfare loss than liquidation. It is a step in the right direction but EU still gives the members sovereignty to implement a certain degree of discretion in its implementation of national laws (Mangelli, 2016). A recommendation to EU would be to implement this regulation in all the membership nations without any exceptions for modification of the regulation. By making companies able to restructure earlier there is a higher possibility of recovery. It will reduce the potential welfare loss for the society by not allocating the assets away from their highest value user.

The results also showed that the optimal solution to reduce the welfare loss for the society is by letting the original owner keep the assets. The optimal solution to do this is by making debt renegotiations easier. Many debt renegotiations often fail due to asymmetric information between creditors and debtors (Oh, 2014). An initiative from EU could be to try to reduce this asymmetric information so a larger amount of the debt renegotiations would succeed. EU has great success in sharing information about criminals across borders in their law enforcement agency, Europol. A similar system could be implemented, with easy access to insolvency information about the debtors in the membership countries. This would increase the transparency of debtors and hence increase the probability of success for a renegotiation of debt. This would potentially keep the assets in the hand of the highest value user. Hence, a lower welfare loss for the society.

The results also show that crisis periods increase the fire-sales discount. This study is primarily considering real assets. In the past during a crisis, the government has bought some financial assets to reduce fire-sales. The difference between a government buying financial assets and real assets is that sometimes the government is the highest value user of financial assets. The government will rarely be the highest value user of real assets.

Furthermore, financial assets have greater implication for the whole economy. Buying financial assets would take off some of the risk from the banks' balance sheets. Thus, this would enable the banks to continue to have a functioning lending activity.

The government should be careful before buying real assets even though there is a fire-sale. This is because they are not the highest value user. However, some companies may be 'too big to fail' and the government could therefore have an interest in saving these firms. The reason is that it would have some more serious consequences for the society, than fire-sale if they went bankrupt. It is important that it is not becoming a habit for the government to bail out firms outside the financial sector. If this happens, some firms will start exploiting this opportunity by taking too much risk. In other words, problems with moral hazard will arise.

7.12.2 Managers engaging in acquisitions

An important implication of the findings in this study is that it is not possible to gain abnormal performance on long-term by acquiring distressed firms. This is also present when there is general distress or the industry is distressed. From a management point of view, this is important to have in mind before engaging in an acquisition of a distressed firm. It might look like an attractive deal on the surface. However, there might be some nasty surprises. There is a reason why these firms are heading towards bankruptcy. Even though the manager believes he have gained superior turnaround skills through experience the results show that experience is not significantly affecting the performance. Furthermore, even though the firm has the resources needed to make the turnaround the results shows that it is not sufficient to gain abnormal performance in the long run. Even corporate raiders, which make a living of acquiring firms and make turnarounds, prefer to buy healthy firms (Walsh & Kosnik, 1993). This signals that buying distressed firms is tough business. The manager should be really careful when engaging in such an acquisition because the corporate raiders are supposed to have superior skills in turnarounds of businesses. The findings could indicate that there are many exogenous factors that the manager cannot control, which drives the outcome. This study did not find anything there could justify why a manager is going into a deal of a distressed target. The recommendation is therefore that the manager should stay out of deals like this or at least consider them carefully before undertaking the investment.

7.12.3 Management of firms

When a firm is facing financial distress, and cannot honor its debt promises it can either be forced to sell off their assets to pay the interest, or hand over the assets to the debt holders if the loan is collateralized. The price they receive from their assets are highly depended on the liquidity condition on the market. This means that if the

market is highly liquid they can sell off their asset close to fundamental value. One of the reasons why firms end up with too much debt could be because of the leverage ratchet effect as described in section 2.4.2.3. Once debt is in place, the shareholders will not reduce the leverage regardless of how profitable it is for the firm. This behaviour from the shareholders will at one point in time result in debt overhang where the firm has no debt capacity left. This will ultimately force the firm to either liquidate its assets to repay debt or transfer the assets to the debt holders.

Another reason could be that the management fails to choose an appropriate capital structure. They might base their decision on outdated theories, which fails to capture the big picture. Both Modigliani & Miller (1958) and Myers & Majluf (1984) is not realistic because their models do not account for collateralized lending, which plays a huge role in the reality. The trade-off theory is having a more up-to-date perspective because they include bankruptcy cost and taxes. However, this theory is a static model and is basing the optimal capital structure from a firms point of view. The findings in this study suggest that a firms management cannot base their decision on these models. An implication of this study's findings is that managers should look across their industry before choosing the right capital structure for the firm. If the industry is highly levered the management will have to choose a lower debt level. Because when they face distress and they are forced to sell their assets, there will be lower number of potential buyers. On the other hand, if the industry leverage is low the manager can choose a higher debt level, because in case of distress, there will be more buyers with a higher potential valuation of the assets to compete with each other. This will result in that the fire-sale discount might be avoided. To sum up, a firms capital structure is highly depended on their industry peers. Another finding in this study is that the general market liquidity is a deterministic factor of fire-sale discount. The management should therefore consider the market liquidity when choosing an appropriate debt level. Despite avoiding liquidation cost it also makes it possible for the firm to be on the buy-side when the industry faces distress. This allows the firm to buy its rivals at a discounted price. This means that it is not sufficient to apply a static capital structure. The capital structure has to be dynamic and has to change with the general market liquidity conditions. These findings give occasion to criticism of existing literature. These, capital structure models are too simple and needs some additional properties before they can be used as decision making tools for the management.

8 Conclusion

The primary motivation behind this paper was to examine, which properties that was a channel of fire-sale on the European market. This is a new contribution to the field. The papers ambitions were to approach the topic from the acquirers point of view.

There are several reasons why firms engage in acquisitions. The paper distinguishes between two types of merger incentives; Value increasing- and value decreasing theories. Value increasing theories implies that the firm is catching some synergies from the merger. Value decreasing theories is a product of bounded rationality and agency costs. Among those incentives are; Efficiency gains, market power, corporate control, managerial hubris, managerial discretion, managerial entrenchment and empire building.

The paper found three leading theories within capital structure. The first is Modigliani & Miller (1958), which says that capital structure is irrelevant, because it does not increase firm value. This is because the investor can use homemade leverage. Myers & Majluf (1984) said that capital structure is a product of financing choices over time, following a pecking order. Therefore, there is no optimal capital structure. The last theory is Kraus & Litzenberger (1973), which suggests that the optimal capital structure was where the firm value was maximized as a trade-of off the tax shield and bankruptcy cost.

One cost associated with imposing risky debt is agency cost. The paper found that excessive risk-taking, debt overhang and the leverage ratchet effect plays an important role when deciding the optimal capital structure. If the firm becomes too leveraged the firm will start experiencing financial distress, which is another cost arising if the firm have trouble honoring their debt promises.

Financial distress is associated with different consequences. It can either result in increased performance or some cost. Financial distress forces the management to make value maximizing choices and increased bargain power against labor unions. They can also increase the bargain power over the senior debt holders. The cost related is; loss of customers, loss of suppliers, loss of key employees, agency cost and fire-sale, which is in particular interest for this study.

The most acknowledged theory within fire-sales literature to explain why distressed targets are sold with a discount is made by Shleifer & Vishny (1992). This theory is suggesting that in order for a fire-sale to occur two things have to be present; firm- and industry-level distress. They also argue that the redeployability of assets is

a deterministic factor for the fire-sale discount. This was also earlier found by Williamson (1988). The reason is that a potentially lower valuation buyer cannot utilize the assets as in best use.

It was found that experience should have an impact on the acquisition outcome, the argument is that the managers are becoming better to integrate the processes when buying a firm. Furthermore, generalizable turnaround skills associated with a larger firm as excess cash, borrowing capacity and managerial time was expected to have an effect on the acquisition outcome.

After the theoretical examination, the paper took an empirical approach. It was found that acquirering a distressed target was related with a higher abnormal performance compared to a non-distressed target on short-term. An acquirer of a distressed target is on average gaining an abnormal announcement return of 0.058 and 0.062 percent depending on the distress measure used compared to a non-distressed target.

One implication of Shleifer & Vishny's (1992) theory is that firm- and industry-level distress is a channel of fire-sale. The study was able to show a significant relationship between the price discounts and when firm- and industry-level distress is present, which is consistent with the theory. The presence of firm- and industry-level distress resulted in a wealth transfer to the acquirer.

The study also found that acquirer identity is a deterministic factor for price discount. This means that an outsider will collect a higher discount, shown in a higher wealth transfer, when engaging in a fire-sale acquisition. This is also one of the implications of Shleifer & Vishny's (1992) theory. However, the study was unable to show that firm- and industry-level distress increased the probability of a target to be sold to an outsider. The paper was also able to show that the illiquidity of unlisted targets and a difficult access to the equity market was a channel of fire-sale, which resulted in a wealth transfer to the acquirer. This result was not robust at all since there was limited data, violation of assumptions and only presence on one distress measure.

The last thing the study could conclude was that general economic- and financial crisis was a fire-sales channel. Acquiring a distressed target during a crisis period resulted in a wealth transfer to the acquirer compared to when acquiring firms where crisis and firm-level distress were not present. This was also one of the implicit predictions made by Shleifer & Vishny (1992) the study was able to prove.

The study was however not able to show that implicit competition had an impact on the price discount. This finding does not support Shleifer & Vishny (1992). Since, the amount of potentially high value buyers should affect the price discount.

The specificity of the assets was also examined as a potential property, which could help explain the discounts of distressed targets. The study could not find any evidence to support this theory stated by Williamsson (1988) and Shleifer & Vishny (1992) on both short- and long-term.

The study neither found evidence that supported equity- and debt market conditions as influential properties on the price discount on short- and long-term.

Finally, acquirer characteristics, which could potentially give a larger wealth transfer to the acquirer, was examined. The study could not provide results there supported these hypotheses.

The study was not able, in any of the hypothesis, to show any long-term abnormal gains for the acquirers and hence no fire-sales discount on the long-term.

Due to the findings, the study has found some practical implications for different stakeholders. From the governments points of view the study recommend a review of the antitrust- and insolvency law to be updated and made relevant for a more globalized society. Another recommendation is being that debt renegotiation should be easier, this proposal was aiming to reducing the asymmetric information between the creditors and debtors.

The final recommendation for the government was how they should handle the market for real assets in a period of general crisis. The study did not come up with some specific actions to meet the problem but instead gave some inputs to take into consideration.

The study also found some recommendation for the managers that are attending in acquisitions. The message is that even though a distressed target looks like a great deal, it might be a highly complex task to succeed. Therefore, the management should carefully consider acquirer a target, which faces distress. The reason for this is that the study could not find any properties that resulted in abnormal performance for the acquirer on long-term.

The last recommendation was aiming to give management of firms some guidelines when choosing an appropriate capital structure. It was proposed that the management should both look on the industry debt level and on the market liquidity. The reason is that it is not enough just to consider one's own firm when choosing a capital structure. It was recommended that the management should not base their decisions on existing theories. Instead the management should consider a more dynamic decision-making tool.

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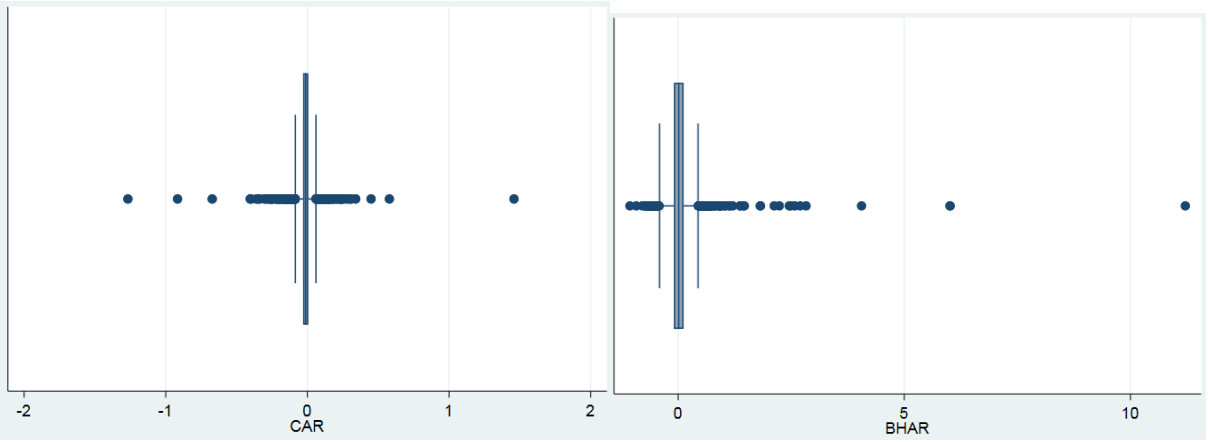
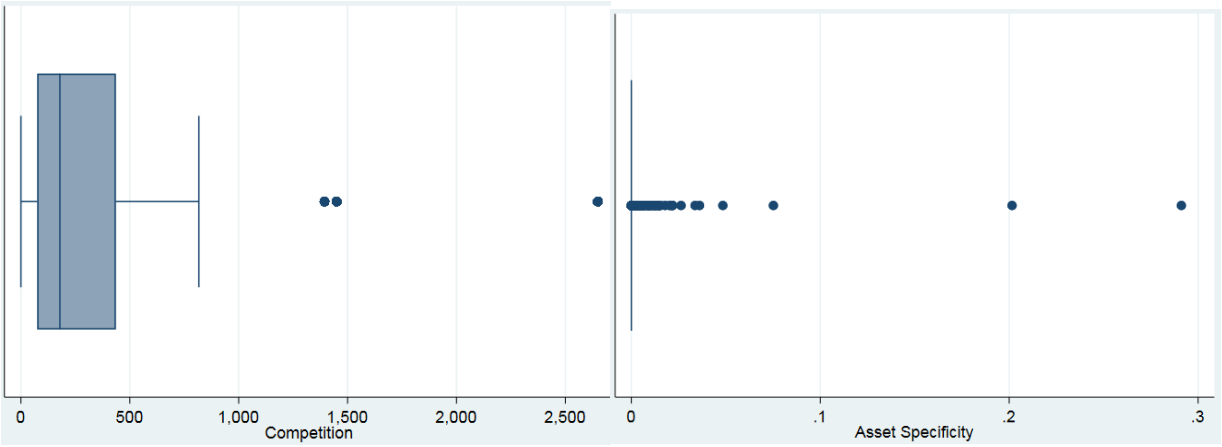
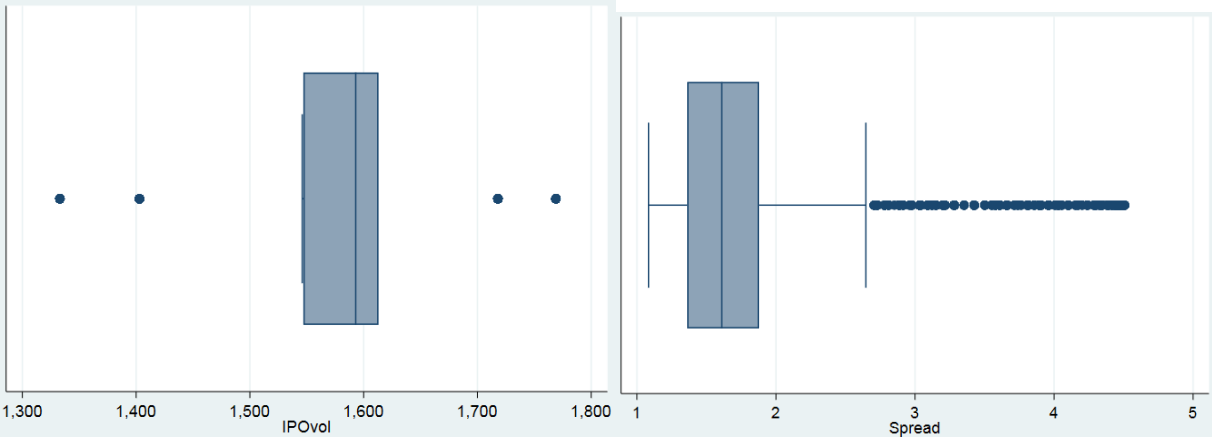
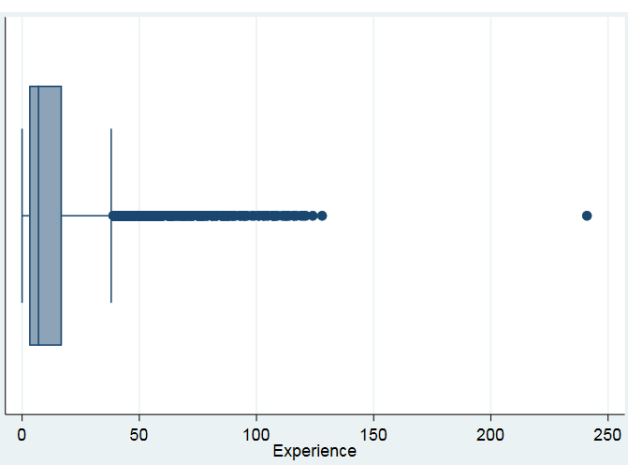
Table of Content - Appendix

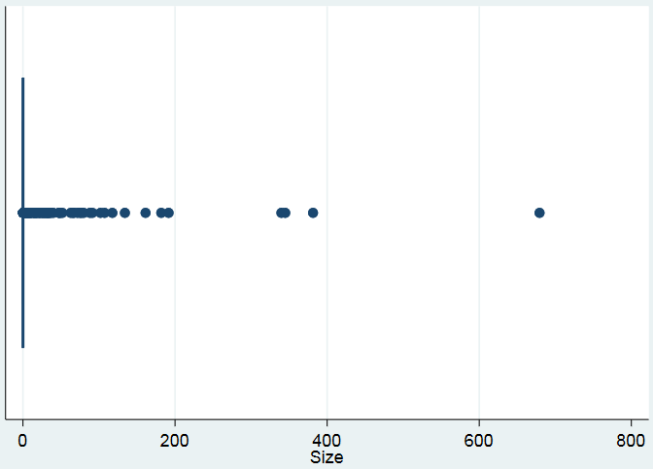
Appendix 1 – Box-and-Whiskers plots











Appendix 2 – Data and VIF

The attached disc contains the excel file with the full data set (sheet 1) and VIF tables (sheet 2) for later use in the assumptions. Furthermore, the disc contains the do-file with the code used in STATA.

Appendix 3 – Regressions first hypothesis

First distress measure

Short-term:

Source	SS	df	MS	Number of obs	=	2,230
				F(423, 1806)	=	1.56
Model	1.51907747	423	.0035912	Prob > F	=	0.0000
Residual	4.1452723	1,806	.002295278	R-squared	=	0.2682
				Adj R-squared	=	0.0968
Total	5.66434976	2,229	.002541207	Root MSE	=	.04791

car	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
distress1	.0057657	.0028836	2.00	0.046	.0001101	.0114214
acquirertangibilitycontrol	.0032209	.0081905	0.39	0.694	-.0128429	.0192848
acquirerleveragecontrol	.0029263	.0072013	0.41	0.685	-.0111975	.01705
targettangibilitycontrol	.0042657	.0065985	0.65	0.518	-.0086758	.0172073
targetleveragecontrol	-.011757	.0060669	-1.94	0.053	-.0236559	.0001418
acquirertobinsq	.0022779	.0010649	2.14	0.033	.0001893	.0043665
allstocks	-.00267	.0058521	-0.46	0.648	-.0141475	.0088075
allcash	-.0010338	.0041436	-0.25	0.803	-.0091606	.007093
initialstake	-.026385	.0137604	-1.92	0.055	-.0533731	.000603
acquirermarkettobook	.0002494	.0001406	1.77	0.076	-.0000263	.000525

Long-term:

Source	SS	df	MS	Number of obs	=	2,138
				F(416, 1721)	=	0.78
Model	18.0788786	416	.043458843	Prob > F	=	0.9988
Residual	95.3237601	1,721	.055388588	R-squared	=	0.1594
				Adj R-squared	=	-0.0438
Total	113.402639	2,137	.053066279	Root MSE	=	.23535

bhar	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
distress1	-.0110652	.0145131	-0.76	0.446	-.0395304	.0174
acquirertangibilitycontrol	-.0853017	.0412171	-2.07	0.039	-.1661427	-.0044608
acquirerleveragecontrol	-.0365125	.0361718	-1.01	0.313	-.1074579	.0344329
targettangibilitycontrol	.0206332	.033466	0.62	0.538	-.045005	.0862714
targetleveragecontrol	-.0277169	.030445	-0.91	0.363	-.0874299	.0319962
acquirertobinsq	.0105085	.0057174	1.84	0.066	-.0007052	.0217223
allstocks	-.0257577	.0303372	-0.85	0.396	-.0852593	.033744
allcash	-.0152395	.0211927	-0.72	0.472	-.0568056	.0263266
initialstake	.0820612	.0695523	1.18	0.238	-.0543547	.2184771
acquirermarkettobook	.0003476	.0007026	0.49	0.621	-.0010304	.0017256

Second distress measure

Short-term:

Source	SS	df	MS	Number of obs	=	2,290
				F(426, 1863)	=	1.88
Model	1.89756688	426	.004454382	Prob > F	=	0.0000
Residual	4.40822749	1,863	.002366198	R-squared	=	0.3009
				Adj R-squared	=	0.1411
Total	6.30579437	2,289	.002754825	Root MSE	=	.04864

car	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
distress2	.0061879	.0025687	2.41	0.016	.00115	.0112257
acquirertangibilitycontrol	.0059087	.0081753	0.72	0.470	-.0101251	.0219425
acquirerleveragecontrol	.0045198	.0072017	0.63	0.530	-.0096044	.0186439
targettangibilitycontrol	.0021179	.0065228	0.32	0.745	-.0106749	.0149106
targetleveragecontrol	-.0090674	.0053349	-1.70	0.089	-.0195304	.0013956
acquirertobinsq	.0024715	.0010668	2.32	0.021	.0003793	.0045638
allstocks	-.0019658	.0057916	-0.34	0.734	-.0133245	.0093929
allcash	-.0012856	.0041471	-0.31	0.757	-.0094189	.0068478
initialstake	-.0274838	.0136553	-2.01	0.044	-.054265	-.0007026
acquirermarkettobook	.0002376	.0001422	1.67	0.095	-.0000414	.0005165

Long-term:

Source	SS	df	MS	Number of obs	=	2,198
				F(419, 1778)	=	0.66
Model	20.4503857	419	.048807603	Prob > F	=	1.0000
Residual	130.900882	1,778	.073622543	R-squared	=	0.1351
				Adj R-squared	=	-0.0687
Total	151.351267	2,197	.068889971	Root MSE	=	.27133

bhar	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
distress2	.0287661	.0147238	1.95	0.051	-.0001116	.0576438
acquirertangibilitycontrol	-.0788783	.0467039	-1.69	0.091	-.1704785	.012722
acquirerleveragecontrol	-.0411378	.0410492	-1.00	0.316	-.1216475	.0393719
targettangibilitycontrol	.0120204	.0374708	0.32	0.748	-.061471	.0855119
targetleveragecontrol	-.0421503	.0303076	-1.39	0.164	-.1015926	.0172921
acquirertobinsq	.0119226	.0064892	1.84	0.066	-.0008047	.0246499
allstocks	-.0311849	.033999	-0.92	0.359	-.097867	.0354973
allcash	-.0165665	.0240626	-0.69	0.491	-.0637604	.0306275
initialstake	.0803398	.078274	1.03	0.305	-.0731788	.2338584
acquirermarkettobook	.0002826	.0008075	0.35	0.726	-.0013011	.0018663

Appendix 4 – Regressions second hypothesis

First distress measure

Short-term

Source	SS	df	MS	Number of obs	=	2,230
				F(424, 1805)	=	1.59
Model	1.54098677	424	.003634403	Prob > F	=	0.0000
Residual	4.12336299	1,805	.002284412	R-squared	=	0.2721
				Adj R-squared	=	0.1011
Total	5.66434976	2,229	.002541207	Root MSE	=	.0478

car	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
firesales1	.011232	.0033751	3.33	0.001	.0046124	.0178515
industryd	-.0119117	.0038463	-3.10	0.002	-.0194555	-.004368
distress1	0	(omitted)				
acquirertangibilitycontrol	.0023941	.0081755	0.29	0.770	-.0136403	.0184285
acquirerleveragecontrol	.0031873	.0071847	0.44	0.657	-.010904	.0172785
targettangibilitycontrol	.0038125	.0065845	0.58	0.563	-.0091016	.0167266
targetleveragecontrol	.0003335	.0072024	0.05	0.963	-.0137924	.0144594
acquirertobinsq	.0023235	.0010625	2.19	0.029	.0002397	.0044074
allstocks	-.0031618	.0058404	-0.54	0.588	-.0146163	.0082928
allcash	-.0011328	.0041339	-0.27	0.784	-.0092406	.0069749
initialstake	-.0270473	.0137295	-1.97	0.049	-.0539747	-.00012
acquirermarkettobook	.0002431	.0001402	1.73	0.083	-.0000319	.0005181

Long-term

Source	SS	df	MS	Number of obs	=	2,138
				F(417, 1720)	=	0.79
Model	18.2081905	417	.043664725	Prob > F	=	0.9986
Residual	95.1944482	1,720	.055345609	R-squared	=	0.1606
				Adj R-squared	=	-0.0430
Total	113.402639	2,137	.053066279	Root MSE	=	.23526

bhar	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
firesales1	.0026811	.0170688	0.16	0.875	-.0307966	.0361588
industryd	-.0296897	.0194235	-1.53	0.127	-.0677859	.0084065
distress1	0	(omitted)				
acquirertangibilitycontrol	-.0871068	.0412181	-2.11	0.035	-.1679496	-.006264
acquirerleveragecontrol	-.0359728	.0361595	-0.99	0.320	-.106894	.0349485
targettangibilitycontrol	.0191855	.0334664	0.57	0.567	-.0464536	.0848246
targetleveragecontrol	.0019953	.0361112	0.06	0.956	-.0688312	.0728219
acquirertobinsq	.0105835	.0057154	1.85	0.064	-.0006263	.0217933
allstocks	-.0278473	.0303562	-0.92	0.359	-.0873863	.0316917
allcash	-.015432	.0211848	-0.73	0.466	-.0569827	.0261187
initialstake	.0808507	.0695298	1.16	0.245	-.0555212	.2172226
acquirermarkettobook	.0003297	.0007024	0.47	0.639	-.001048	.0017074

Second distress measure

Short-term

Source	SS	df	MS	Number of obs	=	2,290
				F(428, 1861)	=	1.90
Model	1.91645558	428	.0044777	Prob > F	=	0.0000
Residual	4.38933879	1,861	.002358592	R-squared	=	0.3039
				Adj R-squared	=	0.1438
Total	6.30579437	2,289	.002754825	Root MSE	=	.04857

car	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
firesales2	.0117536	.0052351	2.25	0.025	.0014863	.022021
industryd	-.0082174	.0034983	-2.35	0.019	-.0150784	-.0013564
distress2	-.001131	.0042064	-0.27	0.788	-.0093807	.0071187
acquirertangibilitycontrol	.006567	.008186	0.80	0.423	-.0094876	.0226217
acquirerleveragecontrol	.0048874	.0071913	0.68	0.497	-.0092165	.0189913
targettangibilitycontrol	.002797	.0065191	0.43	0.668	-.0099884	.0155825
targetleveragecontrol	-.0034076	.0073576	-0.46	0.643	-.0178377	.0110225
acquirertobinsq	.0024408	.0010651	2.29	0.022	.0003519	.0045298
allstocks	-.0025998	.0057866	-0.45	0.653	-.0139488	.0087491
allcash	-.0013539	.0041405	-0.33	0.744	-.0094745	.0067666
initialstake	-.0272983	.0136396	-2.00	0.045	-.0540488	-.0005478
acquirermarkettobook	.0002349	.000142	1.65	0.098	-.0000436	.0005134

Long-term

Source	SS	df	MS	Number of obs	=	2,198
				F(421, 1776)	=	0.67
Model	20.6681791	421	.049093062	Prob > F	=	1.0000
Residual	130.683088	1,776	.07358282	R-squared	=	0.1366
				Adj R-squared	=	-0.0681
Total	151.351267	2,197	.068889971	Root MSE	=	.27126

bhar	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
firesales2	.0091016	.030037	0.30	0.762	-.0498099	.0680131
industryd	-.0339614	.0199416	-1.70	0.089	-.0730729	.00515
distress2	.0238159	.0242252	0.98	0.326	-.0236971	.0713289
acquirertangibilitycontrol	-.0808068	.0468274	-1.73	0.085	-.1726494	.0110358
acquirerleveragecontrol	-.040326	.0410447	-0.98	0.326	-.120827	.0401751
targettangibilitycontrol	.0123897	.0375024	0.33	0.741	-.0611637	.0859431
targetleveragecontrol	.0030007	.0418462	0.07	0.943	-.0790723	.0850737
acquirertobinsq	.0117585	.0064883	1.81	0.070	-.0009669	.024484
allstocks	-.0335973	.0340281	-0.99	0.324	-.1003367	.0331422
allcash	-.0167703	.0240564	-0.70	0.486	-.0639522	.0304116
initialstake	.0790623	.0782867	1.01	0.313	-.0744814	.232606
acquirermarkettobook	.0002706	.0008073	0.34	0.738	-.0013127	.0018539

Appendix 5 – Regressions third hypothesis

First distress measure

Probit regression — Number of obs = 1,328
LR chi2(174) = 480.54
Prob > chi2 = 0.0000
Log likelihood = -671.28111 — Pseudo R2 = 0.2636

out	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
firesales1	.0479214	.1263694	0.38	0.705	-.199758	.2956008
industryd	.0666293	.1404241	0.47	0.635	-.2085968	.3418555
distress1	0	(omitted)				
acquirertangibilitycontrol	-.2514865	.3366808	-0.75	0.455	-.9113686	.4083957
acquirerleveragecontrol	.5131975	.3052925	1.68	0.093	-.0851648	1.11156
targettangibilitycontrol	.2319185	.2992419	0.78	0.438	-.3545849	.8184219
targetleveragecontrol	-.1027088	.2735426	-0.38	0.707	-.6388424	.4334249
acquirertobinsq	-.0069849	.0422561	-0.17	0.869	-.0898054	.0758356
allstocks	.3618707	.2210807	1.64	0.102	-.0714395	.7951808
allcash	-.0290215	.1535254	-0.19	0.850	-.3299258	.2718828
initialstake	-.2259502	.5191177	-0.44	0.663	-1.243402	.7915018
acquirermarkettobook	-.0016578	.0063009	-0.26	0.792	-.0140073	.0106916

Second distress measure

Probit regression — Number of obs = 1,367
LR chi2(175) = 498.06
Prob > chi2 = 0.0000
Log likelihood = -688.02877 — Pseudo R2 = 0.2658

out	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
firesales2	.274285	.191723	1.43	0.153	-.1014852	.6500551
industryd	.021313	.1274242	0.17	0.867	-.2284338	.2710598
distress2	-.0268906	.1532036	-0.18	0.861	-.3271642	.273383
acquirertangibilitycontrol	-.2826935	.3302746	-0.86	0.392	-.9300198	.3646328
acquirerleveragecontrol	.6615003	.2997716	2.21	0.027	.0739588	1.249042
targettangibilitycontrol	.2776478	.2905719	0.96	0.339	-.2918627	.8471583
targetleveragecontrol	-.1890783	.275773	-0.69	0.493	-.7295835	.3514269
acquirertobinsq	-.003373	.0416649	-0.08	0.935	-.0850347	.0782886
allstocks	.3554953	.217433	1.63	0.102	-.0706656	.7816562
allcash	-.0180803	.1508291	-0.12	0.905	-.3136998	.2775393
initialstake	-.1858524	.5132934	-0.36	0.717	-1.191889	.8201841
acquirermarkettobook	-.0003729	.0061149	-0.06	0.951	-.0123579	.0116121

Appendix 6 – Regressions fourth hypothesis

First distress measure

Short-term

Source	SS	df	MS	Number of obs	=	2,230
				F(426, 1803)	=	1.60
Model	1.55046439	426	.003639588	Prob > F	=	0.0000
Residual	4.11388537	1,803	.002281689	R-squared	=	0.2737
				Adj R-squared	=	0.1021
Total	5.66434976	2,229	.002541207	Root MSE	=	.04777

car	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
firesales1out	.0102026	.005016	2.03	0.042	.0003648	.0200404
industryd	-.0117581	.0038448	-3.06	0.002	-.0192988	-.0042174
out	-.0038917	.0034445	-1.13	0.259	-.0106474	.002864
firesales1	.00453	.004718	0.96	0.337	-.0047233	.0137833
distress1	0	(omitted)				
acquirertangibilitycontrol	.0029795	.008176	0.36	0.716	-.013056	.019015
acquirerleveragecontrol	.0032015	.0071844	0.45	0.656	-.0108891	.0172921
targettangibilitycontrol	.0043374	.0065859	0.66	0.510	-.0085794	.0172542
targetleveragecontrol	-.000048	.0072005	-0.01	0.995	-.0141702	.0140743
acquirertobinsq	.00239	.0010624	2.25	0.025	.0003063	.0044736
allstocks	-.0031723	.0058408	-0.54	0.587	-.0146278	.0082832
allcash	-.0011446	.0041322	-0.28	0.782	-.009249	.0069597
initialstake	-.0267412	.0137221	-1.95	0.051	-.0536541	.0001718
acquirermarkettobook	.0002447	.0001402	1.75	0.081	-.0000301	.0005196

Long-term

Source	SS	df	MS	Number of obs	=	2,138
				F(419, 1718)	=	0.78
Model	18.2178703	419	.043479404	Prob > F	=	0.9989
Residual	95.1847684	1,718	.055404405	R-squared	=	0.1606
				Adj R-squared	=	-0.0441
Total	113.402639	2,137	.053066279	Root MSE	=	.23538

bhar	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
firesales1out	.003641	.0253048	0.14	0.886	-.0459905	.0532726
industryd	-.0296903	.0194367	-1.53	0.127	-.0678124	.0084319
out	.0046888	.0174983	0.27	0.789	-.0296315	.0390091
firesales1	.0001693	.0237925	0.01	0.994	-.0464959	.0468346
distress1	0	(omitted)				
acquirertangibilitycontrol	-.086823	.0412713	-2.10	0.036	-.1677704	-.0058757
acquirerleveragecontrol	-.0364314	.0361958	-1.01	0.314	-.1074238	.034561
targettangibilitycontrol	.0192131	.0335091	0.57	0.566	-.0465099	.0849361
targetleveragecontrol	.0019543	.0361481	0.05	0.957	-.0689446	.0728532
acquirertobinsq	.0106379	.0057229	1.86	0.063	-.0005868	.0218625
allstocks	-.0281708	.0303868	-0.93	0.354	-.0877698	.0314282
allcash	-.0152639	.0212019	-0.72	0.472	-.0568482	.0263205
initialstake	.0811247	.0695702	1.17	0.244	-.0553267	.217576
acquirermarkettobook	.0003309	.0007028	0.47	0.638	-.0010475	.0017094

Second distress measure

Short-term

Source	SS	df	MS	Number of obs	=	2,290
				F(430, 1859)	=	1.98
Model	1.98402618	430	.004614014	Prob > F	=	0.0000
Residual	4.32176819	1,859	.002324781	R-squared	=	0.3146
				Adj R-squared	=	0.1561
Total	6.30579437	2,289	.002754825	Root MSE	=	.04822

car	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
firesales2out	.0303204	.0056241	5.39	0.000	.0192902	.0413505
industryd	-.008309	.0034732	-2.39	0.017	-.0151207	-.0014972
out	-.0069029	.0032325	-2.14	0.033	-.0132427	-.0005631
firesales2	-.0084105	.0064064	-1.31	0.189	-.020975	.004154
distress2	-.0015342	.0041771	-0.37	0.713	-.0097264	.0066581
acquirertangibilitycontrol	.0077882	.0081304	0.96	0.338	-.0081574	.0237339
acquirerleveragecontrol	.0047083	.0071453	0.66	0.510	-.0093054	.018722
targettangibilitycontrol	.0025022	.0064735	0.39	0.699	-.0101939	.0151982
targetleveragecontrol	-.0038864	.0073055	-0.53	0.595	-.0182142	.0104413
acquirertobinsq	.0023668	.0010576	2.24	0.025	.0002926	.0044409
allstocks	-.0031527	.0057496	-0.55	0.584	-.014429	.0081236
allcash	-.0009783	.0041119	-0.24	0.812	-.0090426	.0070861
initialstake	-.0256764	.0135448	-1.90	0.058	-.052241	.0008883
acquirermarkettobook	.0002403	.000141	1.70	0.088	-.0000362	.0005169

Long-term

Source	SS	df	MS	Number of obs	=	2,198
				F(423, 1774)	=	0.67
Model	20.7364186	423	.049022266	Prob > F	=	1.0000
Residual	130.614849	1,774	.07362731	R-squared	=	0.1370
				Adj R-squared	=	-0.0688
Total	151.351267	2,197	.068889971	Root MSE	=	.27134

bhar	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
firesales2out	.0160821	.0324773	0.50	0.621	-.0476157	.0797799
industryd	-.0341197	.0199483	-1.71	0.087	-.0732443	.005005
out	.0106433	.0186856	0.57	0.569	-.0260047	.0472913
firesales2	-.0024447	.0371258	-0.07	0.948	-.0752596	.0703702
distress2	.0237317	.0242349	0.98	0.328	-.0238003	.0712638
acquirertangibilitycontrol	-.0800466	.0468634	-1.71	0.088	-.1719598	.0118666
acquirerleveragecontrol	-.0417383	.041087	-1.02	0.310	-.1223223	.0388456
targettangibilitycontrol	.011583	.0375231	0.31	0.758	-.062011	.0851771
targetleveragecontrol	.0031946	.0418694	0.08	0.939	-.0789238	.0853131
acquirertobinsq	.0117978	.0064904	1.82	0.069	-.0009319	.0245275
allstocks	-.03465	.0340563	-1.02	0.309	-.1014448	.0321448
allcash	-.0162864	.0240691	-0.68	0.499	-.0634931	.0309203
initialstake	.0805565	.0783389	1.03	0.304	-.0730898	.2342028
acquirermarkettobook	.0002732	.0008076	0.34	0.735	-.0013107	.0018571

Appendix 7 – Regressions fifth hypothesis

First distress measure

Short-term

Source	SS	df	MS	Number of obs	=	2,230
				F(426, 1803)	=	1.59
Model	1.54580046	426	.00362864	Prob > F	=	0.0000
Residual	4.11854931	1,803	.002284276	R-squared	=	0.2729
				Adj R-squared	=	0.1011
Total	5.66434976	2,229	.002541207	Root MSE	=	.04779

car	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
firesales1competition	-3.31e-06	2.32e-06	-1.43	0.153	-7.86e-06	1.23e-06
industryd	-.0121038	.0038489	-3.14	0.002	-.0196526	-.0045549
competition	-3.37e-07	5.41e-06	-0.06	0.950	-.0000109	.0000103
firesales1	.013848	.0038426	3.60	0.000	.0063116	.0213844
distress1	0	(omitted)				
acquirertangibilitycontrol	.0019697	.0081827	0.24	0.810	-.0140789	.0180184
acquirerleveragecontrol	.0030198	.0071872	0.42	0.674	-.0110764	.0171159
targettangibilitycontrol	.0037393	.0065845	0.57	0.570	-.0091748	.0166535
targetleveragecontrol	.00057	.0072041	0.08	0.937	-.0135593	.0146993
acquirertobinsq	.0023548	.0010633	2.21	0.027	.0002694	.0044403
allstocks	-.0032057	.005844	-0.55	0.583	-.0146675	.0082561
allcash	-.0010594	.0041343	-0.26	0.798	-.0091679	.0070492
initialstake	-.0274675	.0137357	-2.00	0.046	-.0544071	-.000528
acquirermarkettobook	.0002382	.0001403	1.70	0.090	-.000037	.0005133

Long-term

Source	SS	df	MS	Number of obs	=	2,138
				F(419, 1718)	=	0.79
Model	18.2259827	419	.043498765	Prob > F	=	0.9988
Residual	95.176656	1,718	.055399683	R-squared	=	0.1607
				Adj R-squared	=	-0.0440
Total	113.402639	2,137	.053066279	Root MSE	=	.23537

bhar	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
firesales1competition	-5.60e-06	.0000116	-0.48	0.629	-.0000283	.0000171
industryd	-.0299611	.0194474	-1.54	0.124	-.0681041	.0081819
competition	-6.14e-06	.000027	-0.23	0.820	-.0000592	.0000469
firesales1	.0071391	.0194702	0.37	0.714	-.0310487	.0453269
distress1	0	(omitted)				
acquirertangibilitycontrol	-.0880215	.0412698	-2.13	0.033	-.1689658	-.0070771
acquirerleveragecontrol	-.0363278	.0361861	-1.00	0.316	-.1073013	.0346458
targettangibilitycontrol	.0189856	.0334847	0.57	0.571	-.0466895	.0846606
targetleveragecontrol	.0023919	.0361357	0.07	0.947	-.0684827	.0732665
acquirertobinsq	.0107054	.0057238	1.87	0.062	-.0005209	.0219316
allstocks	-.0276665	.0303912	-0.91	0.363	-.0872741	.0319412
allcash	-.0153891	.0211999	-0.73	0.468	-.0569695	.0261912
initialstake	.0798223	.069591	1.15	0.252	-.0566697	.2163143
acquirermarkettobook	.0003208	.000703	0.46	0.648	-.001058	.0016997

Second distress measure

Short-term

Source	SS	df	MS	Number of obs	=	2,290
				F(430, 1859)	=	1.89
Model	1.92069288	430	.004466728	Prob > F	=	0.0000
Residual	4.38510149	1,859	.00235885	R-squared	=	0.3046
				Adj R-squared	=	0.1437
Total	6.30579437	2,289	.002754825	Root MSE	=	.04857

car	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
firesales2competition	-3.42e-06	2.59e-06	-1.32	0.186	-8.50e-06	1.65e-06
industryd	-.0084282	.0035032	-2.41	0.016	-.0152988	-.0015577
competition	-5.76e-07	5.44e-06	-0.11	0.916	-.0000112	.0000101
firesales2	.0144208	.0056314	2.56	0.011	.0033763	.0254654
distress2	-.0011743	.0042116	-0.28	0.780	-.0094342	.0070857
acquirertangibilitycontrol	.0064214	.0081901	0.78	0.433	-.0096414	.0224842
acquirerleveragecontrol	.0047696	.007194	0.66	0.507	-.0093395	.0188787
targettangibilitycontrol	.0028871	.00652	0.44	0.658	-.0099001	.0156744
targetleveragecontrol	-.0033931	.0073589	-0.46	0.645	-.0178257	.0110396
acquirertobinsq	.002496	.0010667	2.34	0.019	.000404	.004588
allstocks	-.0027954	.0057928	-0.48	0.629	-.0141564	.0085657
allcash	-.0012978	.0041412	-0.31	0.754	-.0094196	.0068241
initialstake	-.0276636	.0136477	-2.03	0.043	-.0544301	-.0008971
acquirermarkettobook	.0002328	.000142	1.64	0.101	-.0000458	.0005113

Long-term

Source	SS	df	MS	Number of obs	=	2,198
				F(423, 1774)	=	0.67
Model	20.738452	423	.049027073	Prob > F	=	1.0000
Residual	130.612815	1,774	.073626164	R-squared	=	0.1370
				Adj R-squared	=	-0.0688
Total	151.351267	2,197	.068889971	Root MSE	=	.27134

bhar	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
firesales2competition	-.0000129	.0000147	-0.88	0.379	-.0000417	.0000159
industryd	-.0346929	.019977	-1.74	0.083	-.0738739	.0044881
competition	-.0000109	.0000308	-0.35	0.725	-.0000713	.0000496
firesales2	.0189665	.0323563	0.59	0.558	-.044494	.082427
distress2	.0239171	.0242592	0.99	0.324	-.0236625	.0714967
acquirertangibilitycontrol	-.0816	.0468534	-1.74	0.082	-.1734936	.0102937
acquirerleveragecontrol	-.0407845	.0410653	-0.99	0.321	-.121326	.0397569
targettangibilitycontrol	.0126326	.0375184	0.34	0.736	-.0609524	.0862175
targetleveragecontrol	.0033139	.0418636	0.08	0.937	-.0787934	.0854211
acquirertobinsq	.0120867	.0065008	1.86	0.063	-.0006633	.0248366
allstocks	-.0339841	.0340717	-1.00	0.319	-.100809	.0328408
allcash	-.0166745	.0240685	-0.69	0.489	-.0638801	.0305311
initialstake	.0773074	.0783429	0.99	0.324	-.0763467	.2309614
acquirermarkettobook	.0002635	.0008076	0.33	0.744	-.0013204	.0018474

Appendix 8 – Regressions sixth hypothesis

First distress measure

Short-term

Source	SS	df	MS	Number of obs	=	2,230
				F(426, 1803)	=	1.58
Model	1.5420704	426	.003619884	Prob > F	=	0.0000
Residual	4.12227936	1,803	.002286345	R-squared	=	0.2722
				Adj R-squared	=	0.1003
Total	5.66434976	2,229	.002541207	Root MSE	=	.04782

car	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
firesales1assetspecificity	-.8397684	1.436707	-0.58	0.559	-3.657554	1.978017
industryd	-.0120664	.0038561	-3.13	0.002	-.0196293	-.0045035
assetspecificity	.2512513	1.123692	0.22	0.823	-1.952623	2.455126
firesales1	.0114569	.0033926	3.38	0.001	.0048031	.0181106
distress1	0	(omitted)				
acquirertangibilitycontrol	.0023301	.0081809	0.28	0.776	-.0137149	.0183752
acquirerleveragecontrol	.0031742	.0072012	0.44	0.659	-.0109493	.0172978
targettangibilitycontrol	.0036647	.0065911	0.56	0.578	-.0092624	.0165917
targetleveragecontrol	.0008528	.0072463	0.12	0.906	-.0133592	.0150648
acquirertobinsq	.0023431	.0010639	2.20	0.028	.0002565	.0044297
allstocks	-.0030658	.0058463	-0.52	0.600	-.014532	.0084004
allcash	-.0010178	.0041391	-0.25	0.806	-.0091358	.0071002
initialstake	-.0273374	.0137419	-1.99	0.047	-.0542892	-.0003856
acquirermarkettobook	.0002417	.0001403	1.72	0.085	-.0000334	.0005169

Long-term

Source	SS	df	MS	Number of obs	=	2,138
				F(419, 1718)	=	0.80
Model	18.4443662	419	.044019967	Prob > F	=	0.9979
Residual	94.9582725	1,718	.055272568	R-squared	=	0.1626
				Adj R-squared	=	-0.0416
Total	113.402639	2,137	.053066279	Root MSE	=	.2351

bhar	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
firesales1assetspecificity	-7.588102	7.082811	-1.07	0.284	-21.47994	6.303739
industryd	-.0321653	.0194476	-1.65	0.098	-.0703088	.0059782
assetspecificity	-1.580308	5.544638	-0.29	0.776	-12.45526	9.294644
firesales1	.0054273	.0171315	0.32	0.751	-.0281735	.039028
distress1	0	(omitted)				
acquirertangibilitycontrol	-.0871911	.0411994	-2.12	0.034	-.1679975	-.0063848
acquirerleveragecontrol	-.0382689	.0362134	-1.06	0.291	-.1092959	.032758
targettangibilitycontrol	.016868	.0334648	0.50	0.614	-.0487679	.082504
targetleveragecontrol	.0098077	.0362996	0.27	0.787	-.0613883	.0810037
acquirertobinsq	.0110714	.0057177	1.94	0.053	-.0001431	.0222858
allstocks	-.0255598	.0303593	-0.84	0.400	-.0851048	.0339853
allcash	-.0137302	.0211893	-0.65	0.517	-.0552897	.0278292
initialstake	.0767646	.0695208	1.10	0.270	-.0595897	.213119
acquirermarkettobook	.0003126	.000702	0.45	0.656	-.0010643	.0016894

Second distress measure

Short-term

Source	SS	df	MS	Number of obs	=	2,290
				F(430, 1859)	=	1.89
Model	1.91710164	430	.004458376	Prob > F	=	0.0000
Residual	4.38869273	1,859	.002360781	R-squared	=	0.3040
				Adj R-squared	=	0.1430
Total	6.30579437	2,289	.002754825	Root MSE	=	.04859

car	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
firesales2assetspecificity	-.6808261	1.39822	-0.49	0.626	-3.423072	2.06142
industryd	-.0082473	.003503	-2.35	0.019	-.0151175	-.0013771
assetspecificity	.2152125	1.011274	0.21	0.831	-1.76814	2.198565
firesales2	.0120072	.0052625	2.28	0.023	.0016862	.0223281
distress2	-.001144	.00421	-0.27	0.786	-.0094008	.0071129
acquirertangibilitycontrol	.0065031	.0081919	0.79	0.427	-.0095631	.0225693
acquirerleveragecontrol	.0049107	.0072058	0.68	0.496	-.0092215	.0190429
targettangibilitycontrol	.0027084	.0065255	0.42	0.678	-.0100896	.0155065
targetleveragecontrol	-.0032883	.0073789	-0.45	0.656	-.01776	.0111835
acquirertobinsq	.0024445	.0010667	2.29	0.022	.0003525	.0045366
allstocks	-.0025501	.0057927	-0.44	0.660	-.0139109	.0088107
allcash	-.0013469	.0041444	-0.32	0.745	-.009475	.0067812
initialstake	-.0275062	.0136518	-2.01	0.044	-.0542807	-.0007317
acquirermarkettobook	.0002339	.0001421	1.65	0.100	-.0000448	.0005126

Long-term

Source	SS	df	MS	Number of obs	=	2,198
				F(423, 1774)	=	0.68
Model	21.0368335	423	.049732467	Prob > F	=	1.0000
Residual	130.314434	1,774	.073457967	R-squared	=	0.1390
				Adj R-squared	=	-0.0663
Total	151.351267	2,197	.068889971	Root MSE	=	.27103

bhar	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
firesales2assetspecificity	-9.201475	7.818971	-1.18	0.239	-24.53684	6.13389
industryd	-.0355033	.0199405	-1.78	0.075	-.0746126	.0036061
assetspecificity	-2.824154	5.662144	-0.50	0.618	-13.92933	8.281021
firesales2	.0128786	.0301578	0.43	0.669	-.0462699	.0720272
distress2	.0244782	.0242158	1.01	0.312	-.0230163	.0719726
acquirertangibilitycontrol	-.081013	.046798	-1.73	0.084	-.1727979	.010772
acquirerleveragecontrol	-.0429564	.0410814	-1.05	0.296	-.1235295	.0376166
targettangibilitycontrol	.0097819	.0374889	0.26	0.794	-.0637451	.0833088
targetleveragecontrol	.0089748	.0419156	0.21	0.830	-.0732343	.091184
acquirertobinsq	.0122486	.006491	1.89	0.059	-.0004822	.0249794
allstocks	-.0308502	.0340255	-0.91	0.365	-.0975846	.0358841
allcash	-.0156709	.0240468	-0.65	0.515	-.0628339	.0314921
initialstake	.0739886	.0782582	0.95	0.345	-.0794994	.2274766
acquirermarkettobook	.0002489	.0008067	0.31	0.758	-.0013332	.001831

Appendix 9 – Regressions seventh hypothesis

First distress measure

Short-term

Source	SS	df	MS	Number of obs	=	794
				F(322, 471)	=	1.18
Model	.724389439	322	.002249657	Prob > F	=	0.0504
Residual	.897125438	471	.001904725	R-squared	=	0.4467
				Adj R-squared	=	0.0685
Total	1.62151488	793	.002044785	Root MSE	=	.04364

car	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
distress1unlisted	.2787323	.054047	5.16	0.000	.1725292	.3849354
unlisted	0	(omitted)				
distress1	0	(omitted)				
acquirertangibilitycontrol	.025039	.0145515	1.72	0.086	-.0035549	.0536329
acquirerleveragecontrol	-.0031734	.0140821	-0.23	0.822	-.0308449	.0244981
targettangibilitycontrol	-.0183685	.0112514	-1.63	0.103	-.0404776	.0037407
targetleveragecontrol	.012762	.0091796	1.39	0.165	-.005276	.0308
acquirertobinsq	.0040863	.0017032	2.40	0.017	.0007394	.0074331
allstocks	.0033011	.0097918	0.34	0.736	-.01594	.0225422
allcash	-.0127995	.0071289	-1.80	0.073	-.0268079	.001209
initialstake	-.0221179	.0244709	-0.90	0.367	-.0702037	.0259678
acquirermarkettobook	.0016738	.0004385	3.82	0.000	.0008121	.0025354

Long-term

Source	SS	df	MS	Number of obs	=	768
				F(314, 453)	=	0.46
Model	13.0354141	314	.041514058	Prob > F	=	1.0000
Residual	40.5512482	453	.089517104	R-squared	=	0.2433
				Adj R-squared	=	-0.2813
Total	53.5866623	767	.06986527	Root MSE	=	.29919

bhar	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
distress1unlisted	-.0972071	.37215	-0.26	0.794	-.8285618	.6341475
unlisted	0	(omitted)				
distress1	0	(omitted)				
acquirertangibilitycontrol	-.1660596	.1016287	-1.63	0.103	-.3657817	.0336626
acquirerleveragecontrol	.0759008	.0991164	0.77	0.444	-.1188842	.2706858
targettangibilitycontrol	.0770341	.0801985	0.96	0.337	-.0805733	.2346414
targetleveragecontrol	.0399735	.0637461	0.63	0.531	-.0853013	.1652483
acquirertobinsq	.0010097	.0121236	0.08	0.934	-.0228158	.0248352
allstocks	-.0464262	.0682103	-0.68	0.496	-.180474	.0876216
allcash	.0167601	.0497393	0.34	0.736	-.0809882	.1145084
initialstake	.3087568	.174117	1.77	0.077	-.0334205	.6509342
acquirermarkettobook	.0018162	.0033249	0.55	0.585	-.004718	.0083504

Second distress measure

Short-term

Source	SS	df	MS	Number of obs	=	768
				F(324, 443)	=	1.52
Model	1.11615431	324	.003444921	Prob > F	=	0.0000
Residual	1.00287114	443	.002263817	R-squared	=	0.5267
				Adj R-squared	=	0.1806
Total	2.11902545	767	.002762745	Root MSE	=	.04758

car	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
distress2unlisted	-.0729778	.1256504	-0.58	0.562	-.3199228	.1739672
unlisted	0	(omitted)				
distress2	0	(omitted)				
acquirertangibilitycontrol	.0275663	.0159149	1.73	0.084	-.0037118	.0588445
acquirerleveragecontrol	-.0025407	.0154709	-0.16	0.870	-.0329462	.0278649
targettangibilitycontrol	-.0124139	.0141211	-0.88	0.380	-.0401665	.0153387
targetleveragecontrol	-.0053889	.0088765	-0.61	0.544	-.022834	.0120563
acquirertobinsq	.0060399	.0019195	3.15	0.002	.0022675	.0098123
allstocks	.0128578	.0108315	1.19	0.236	-.0084296	.0341452
allcash	-.0079306	.0082279	-0.96	0.336	-.0241012	.00824
initialstake	-.0473085	.0259658	-1.82	0.069	-.0983401	.003723
acquirermarkettobook	.0013098	.0004192	3.12	0.002	.0004859	.0021338

Long-term

Source	SS	df	MS	Number of obs	=	730
				F(316, 413)	=	0.48
Model	26.3177134	316	.083283903	Prob > F	=	1.0000
Residual	71.3955927	413	.172870685	R-squared	=	0.2693
				Adj R-squared	=	-0.2897
Total	97.7133061	729	.134037457	Root MSE	=	.41578

bhar	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
distress2unlisted	.6955789	.7300903	0.95	0.341	-.7395776	2.130735
unlisted	0	(omitted)				
distress2	0	(omitted)				
acquirertangibilitycontrol	-.1089467	.1449519	-0.75	0.453	-.3938823	.1759889
acquirerleveragecontrol	.0083393	.1404159	0.06	0.953	-.2676797	.2843584
targettangibilitycontrol	.0608801	.1304055	0.47	0.641	-.1954613	.3172214
targetleveragecontrol	-.0609593	.0790753	-0.77	0.441	-.2163996	.094481
acquirertobinsq	.0119802	.0180023	0.67	0.506	-.0234074	.0473677
allstocks	-.1714635	.0980569	-1.75	0.081	-.3642163	.0212893
allcash	-.0334197	.0760665	-0.44	0.661	-.1829454	.116106
initialstake	.3087348	.2375454	1.30	0.194	-.158214	.7756837
acquirermarkettobook	-.0010185	.0039323	-0.26	0.796	-.0087483	.0067112

Appendix 10 – Regressions eighth hypothesis

First distress measure

Short-term

Source	SS	df	MS	Number of obs	=	2,213
				F(427, 1785)	=	1.63
Model	1.57654329	427	.003692139	Prob > F	=	0.0000
Residual	4.03898178	1,785	.002262735	R-squared	=	0.2807
				Adj R-squared	=	0.1087
Total	5.61552506	2,212	.002538664	Root MSE	=	.04757

car	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
distress1unlistedipovol	-9.12e-06	.0000124	-0.73	0.463	-.0000335	.0000153
distress1unlistedspread	.005072	.0031853	1.59	0.111	-.0011754	.0113193
spread	.0050439	.0038033	1.33	0.185	-.0024155	.0125034
ipovol	-1.11e-06	.0000113	-0.10	0.922	-.0000233	.0000211
unlisted	.161008	.0419775	3.84	0.000	.0786778	.2433382
distress1	.0107087	.01948	0.55	0.583	-.0274972	.0489146
acquirertangibilitycontrol	.00391	.0081587	0.48	0.632	-.0120916	.0199115
acquirerleveragecontrol	.0020519	.0071823	0.29	0.775	-.0120346	.0161384
targettangibilitycontrol	.0045336	.0065686	0.69	0.490	-.0083495	.0174166
targetleveragecontrol	-.0114654	.0060504	-1.89	0.058	-.023332	.0004012
acquirertobinsq	.0020019	.0010626	1.88	0.060	-.0000823	.004086
allstocks	-.0025166	.0059422	-0.42	0.672	-.0141711	.0091379
allcash	-.0012941	.0041203	-0.31	0.753	-.0093754	.0067871
initialstake	-.0268682	.0136889	-1.96	0.050	-.0537162	-.0000202
acquirermarkettobook	.0002515	.0001397	1.80	0.072	-.0000224	.0005255

Long-term

Source	SS	df	MS	Number of obs	=	2,133
				F(420, 1712)	=	0.78
Model	18.2665312	420	.043491741	Prob > F	=	0.9989
Residual	94.93305	1,712	.055451548	R-squared	=	0.1614
				Adj R-squared	=	-0.0444
Total	113.199581	2,132	.053095488	Root MSE	=	.23548

bhar	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
distress1unlistedipovol	.0000574	.000062	0.93	0.354	-.0000641	.000179
distress1unlistedspread	-.0054715	.01607	-0.34	0.734	-.0369903	.0260473
spread	.0312265	.0203638	1.53	0.125	-.0087141	.0711671
ipovol	.0000181	.0000572	0.32	0.752	-.0000942	.0001304
unlisted	-.2930799	.208046	-1.41	0.159	-.7011311	.1149713
distress1	-.0917999	.0969653	-0.95	0.344	-.2819828	.0983831
acquirertangibilitycontrol	-.0851386	.0412647	-2.06	0.039	-.1660731	-.0042041
acquirerleveragecontrol	-.0399606	.0363021	-1.10	0.271	-.1111617	.0312405
targettangibilitycontrol	.0214822	.0335164	0.64	0.522	-.0442552	.0872197
targetleveragecontrol	-.0283087	.0305448	-0.93	0.354	-.0882179	.0316004
acquirertobinsq	.0107278	.0057249	1.87	0.061	-.0005007	.0219564
allstocks	-.0242047	.0306122	-0.79	0.429	-.0842459	.0358366
allcash	-.0148318	.021224	-0.70	0.485	-.0564595	.0267958
initialstake	.0782867	.0697703	1.12	0.262	-.0585573	.2151306
acquirermarkettobook	.0003407	.0007033	0.48	0.628	-.0010388	.0017202

Second distress measure

Short-term

Source	SS	df	MS	Number of obs	=	2,273
				F(430, 1842)	=	1.94
Model	1.9472686	430	.004528532	Prob > F	=	0.0000
Residual	4.30971096	1,842	.002339691	R-squared	=	0.3112
				Adj R-squared	=	0.1504
Total	6.25697956	2,272	.002753952	Root MSE	=	.04837

car	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
distress2unlistedipovol	-4.92e-06	.0000132	-0.37	0.709	-.0000308	.000021
distress2unlistedspread	-.0001002	.0032143	-0.03	0.975	-.0064042	.0062038
spread	.0058685	.0038712	1.52	0.130	-.0017239	.0134609
ipovol	-5.96e-06	.0000113	-0.53	0.597	-.000028	.0000161
unlisted	.153754	.0405738	3.79	0.000	.0741785	.2333294
distress2	.013829	.0207254	0.67	0.505	-.0268187	.0544768
acquirertangibilitycontrol	.0069804	.0081551	0.86	0.392	-.0090138	.0229745
acquirerleveragecontrol	.0040714	.007191	0.57	0.571	-.0100319	.0181746
targettangibilitycontrol	.002087	.0065034	0.32	0.748	-.0106679	.0148419
targetleveragecontrol	-.0087062	.0053288	-1.63	0.102	-.0191574	.001745
acquirertobinsq	.0021606	.0010658	2.03	0.043	.0000702	.0042509
allstocks	-.0019787	.005888	-0.34	0.737	-.0135265	.0095691
allcash	-.0013896	.0041291	-0.34	0.737	-.0094877	.0067085
initialstake	-.0272143	.0135925	-2.00	0.045	-.0538725	-.000556
acquirermarkettobook	.0002436	.0001416	1.72	0.086	-.0000341	.0005214

Long-term

Source	SS	df	MS		
				Number of obs	= 2,193
				F(423, 1769)	= 0.68
Model	21.0250091	423	.049704513	Prob > F	= 1.0000
Residual	130.12339	1,769	.073557597	R-squared	= 0.1391
				Adj R-squared	= -0.0668
Total	151.148399	2,192	.068954561	Root MSE	= .27122

bhar	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
distress2unlistedipovol	.0001086	.0000747	1.46	0.146	-.0000378	.0002551
distress2unlistedspread	.0230796	.0184506	1.25	0.211	-.0131077	.0592669
spread	.0164991	.0235628	0.70	0.484	-.0297147	.0627128
ipovol	.0000588	.0000644	0.91	0.362	-.0000676	.0001851
unlisted	-.2373923	.2276554	-1.04	0.297	-.6838941	.2091095
distress2	-.183903	.1170556	-1.57	0.116	-.4134848	.0456788
acquirertangibilitycontrol	-.0760351	.0467168	-1.63	0.104	-.1676611	.0155909
acquirerleveragecontrol	-.0464246	.0411373	-1.13	0.259	-.1271075	.0342584
targettangibilitycontrol	.0112583	.0375079	0.30	0.764	-.0623062	.0848229
targetleveragecontrol	-.0445528	.0303867	-1.47	0.143	-.1041505	.0150449
acquirertobinsq	.0121927	.0064921	1.88	0.061	-.0005403	.0249257
allstocks	-.0284774	.0342853	-0.83	0.406	-.0957213	.0387665
allcash	-.0169137	.0240712	-0.70	0.482	-.0641247	.0302973
initialstake	.0772486	.0783511	0.99	0.324	-.0764219	.230919
acquirermarkettobook	.0002085	.000808	0.26	0.796	-.0013762	.0017932

Appendix 11 – Regressions ninth hypothesis

First distress measure

Short-term

Source	SS	df	MS	Number of obs	=	2,230
				F(425, 1804)	=	1.61
Model	1.55528248	425	.003659488	Prob > F	=	0.0000
Residual	4.10906729	1,804	.002277753	R-squared	=	0.2746
				Adj R-squared	=	0.1037
Total	5.66434976	2,229	.002541207	Root MSE	=	.04773

car	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
distress1crisis	.0256809	.0067698	3.79	0.000	.0124035	.0389583
crisis	.0013689	.0082282	0.17	0.868	-.0147689	.0175067
distress1	.0024048	.0030038	0.80	0.423	-.0034864	.008296
acquirertangibilitycontrol	.0029683	.0081611	0.36	0.716	-.0130379	.0189745
acquirerleveragecontrol	.0026029	.0071821	0.36	0.717	-.0114832	.0166891
targettangibilitycontrol	.0037807	.0065796	0.57	0.566	-.0091237	.0166852
targetleveragecontrol	-.0119113	.006044	-1.97	0.049	-.0237653	-.0000572
acquirertobinsq	.0022606	.001061	2.13	0.033	.0001797	.0043416
allstocks	-.0032678	.0058333	-0.56	0.575	-.0147085	.0081729
allcash	-.0009772	.0041283	-0.24	0.813	-.0090739	.0071196
initialstake	-.0269757	.0137124	-1.97	0.049	-.0538696	-.0000818
acquirermarkettobook	.0002507	.0001401	1.79	0.074	-.000024	.0005254

Long-term

Source	SS	df	MS	Number of obs	=	2,138
				F(418, 1719)	=	0.78
Model	18.1064858	418	.043316952	Prob > F	=	0.9990
Residual	95.2961529	1,719	.055436971	R-squared	=	0.1597
				Adj R-squared	=	-0.0447
Total	113.402639	2,137	.053066279	Root MSE	=	.23545

bhar	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
distress1crisis	.0089394	.0339745	0.26	0.792	-.0576963	.0755751
crisis	-.0311861	.044513	-0.70	0.484	-.1184914	.0561192
distress1	-.0121146	.0151791	-0.80	0.425	-.0418861	.0176568
acquirertangibilitycontrol	-.0857973	.0412449	-2.08	0.038	-.1666929	-.0049018
acquirerleveragecontrol	-.0352594	.0362347	-0.97	0.331	-.106328	.0358093
targettangibilitycontrol	.021361	.0335038	0.64	0.524	-.0443515	.0870735
targetleveragecontrol	-.027674	.030459	-0.91	0.364	-.0874146	.0320666
acquirertobinsq	.0105492	.0057204	1.84	0.065	-.0006704	.0217689
allstocks	-.0261323	.0303816	-0.86	0.390	-.085721	.0334564
allcash	-.0151699	.0212059	-0.72	0.474	-.056762	.0264223
initialstake	.080572	.0696153	1.16	0.247	-.0559677	.2171117
acquirermarkettobook	.000364	.0007033	0.52	0.605	-.0010154	.0017434

Second distress measure

Short-term

Source	SS	df	MS	Number of obs	=	2,290
				F(428, 1861)	=	1.89
Model	1.90935204	428	.004461103	Prob > F	=	0.0000
Residual	4.39644233	1,861	.002362409	R-squared	=	0.3028
				Adj R-squared	=	0.1424
Total	6.30579437	2,289	.002754825	Root MSE	=	.0486

car	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
distress2crisis	.0139942	.0070309	1.99	0.047	.000205	.0277834
crisis	.0036166	.0083227	0.43	0.664	-.0127063	.0199394
distress2	.0043147	.002734	1.58	0.115	-.0010473	.0096767
acquirertangibilitycontrol	.0070386	.0081855	0.86	0.390	-.0090151	.0230924
acquirerleveragecontrol	.0037945	.0072067	0.53	0.599	-.0103396	.0179286
targettangibilitycontrol	.0013962	.0065269	0.21	0.831	-.0114046	.0141969
targetleveragecontrol	-.0089386	.0053327	-1.68	0.094	-.0193973	.0015202
acquirertobinsq	.0024489	.0010661	2.30	0.022	.0003579	.0045398
allstocks	-.0023133	.0057914	-0.40	0.690	-.0136716	.009045
allcash	-.001484	.0041447	-0.36	0.720	-.0096128	.0066447
initialstake	-.0258804	.0136634	-1.89	0.058	-.0526776	.0009167
acquirermarkettobook	.0002388	.0001422	1.68	0.093	-.0000401	.0005176

Long-term

Source	SS	df	MS	Number of obs	=	2,198
				F(421, 1776)	=	0.66
Model	20.4812022	421	.048648936	Prob > F	=	1.0000
Residual	130.870065	1,776	.0736881	R-squared	=	0.1353
				Adj R-squared	=	-0.0696
Total	151.351267	2,197	.068889971	Root MSE	=	.27146

bhar	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
distress2crisis	-.0150735	.0402343	-0.37	0.708	-.0939851	.0638382
crisis	-.0211953	.0506383	-0.42	0.676	-.1205122	.0781217
distress2	.0308728	.0156797	1.97	0.049	.0001203	.0616253
acquirertangibilitycontrol	-.0801695	.0468198	-1.71	0.087	-.1719973	.0116582
acquirerleveragecontrol	-.0395601	.0411408	-0.96	0.336	-.1202496	.0411295
targettangibilitycontrol	.013187	.0375334	0.35	0.725	-.0604273	.0868012
targetleveragecontrol	-.0421709	.0303257	-1.39	0.165	-.1016488	.017307
acquirertobinsq	.0119994	.0064932	1.85	0.065	-.0007357	.0247346
allstocks	-.0305207	.0340568	-0.90	0.370	-.0973164	.036275
allcash	-.0164823	.0240762	-0.68	0.494	-.063703	.0307385
initialstake	.0776212	.0784552	0.99	0.323	-.076253	.2314954
acquirermarkettobook	.0002893	.0008084	0.36	0.720	-.0012962	.0018749

Appendix 12 – Regressions tenth hypothesis

First distress measure

Short-term

Source	SS	df	MS	Number of obs	=	2,230
				F(425, 1804)	=	1.56
Model	1.51957834	425	.003575478	Prob > F	=	0.0000
Residual	4.14477143	1,804	.002297545	R-squared	=	0.2683
				Adj R-squared	=	0.0959
Total	5.66434976	2,229	.002541207	Root MSE	=	.04793

car	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
distress1experience	-.0000186	.0001169	-0.16	0.873	-.000248	.0002107
experience	-.0000193	.0000705	-0.27	0.784	-.0001576	.0001189
distress1	.0060563	.0033976	1.78	0.075	-.0006073	.0127199
acquirertangibilitycontrol	.0029593	.0082137	0.36	0.719	-.0131501	.0190687
acquirerleveragecontrol	.003602	.0073589	0.49	0.625	-.0108309	.018035
targettangibilitycontrol	.004351	.0066049	0.66	0.510	-.008603	.017305
targetleveragecontrol	-.011932	.0060817	-1.96	0.050	-.0238599	-4.11e-06
acquirertobinsq	.0023102	.0010692	2.16	0.031	.0002131	.0044072
allstocks	-.0027463	.0058578	-0.47	0.639	-.0142351	.0087424
allcash	-.0010544	.0041463	-0.25	0.799	-.0091865	.0070778
initialstake	-.026316	.0137681	-1.91	0.056	-.053319	.0006871
acquirermarkettobook	.0002551	.0001412	1.81	0.071	-.0000218	.0005321

Long-term

Source	SS	df	MS	Number of obs	=	2,138
				F(418, 1719)	=	0.78
Model	18.1336669	418	.043381978	Prob > F	=	0.9990
Residual	95.2689718	1,719	.055421159	R-squared	=	0.1599
				Adj R-squared	=	-0.0444
Total	113.402639	2,137	.053066279	Root MSE	=	.23542

bhar	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
distress1experience	.0005553	.0005818	0.95	0.340	-.0005859	.0016964
experience	-.0002685	.0003511	-0.76	0.445	-.0009572	.0004201
distress1	-.0196069	.0170781	-1.15	0.251	-.0531029	.0138891
acquirertangibilitycontrol	-.085377	.0413257	-2.07	0.039	-.1664308	-.0043231
acquirerleveragecontrol	-.0350154	.0370059	-0.95	0.344	-.1075967	.037566
targettangibilitycontrol	.0201406	.0334865	0.60	0.548	-.0455379	.0858192
targetleveragecontrol	-.0279177	.0305108	-0.92	0.360	-.0877599	.0319245
acquirertobinsq	.0108047	.0057482	1.88	0.060	-.0004694	.0220788
allstocks	-.0260621	.0303646	-0.86	0.391	-.0856176	.0334935
allcash	-.0150006	.0212015	-0.71	0.479	-.056584	.0265828
initialstake	.0817831	.0695802	1.18	0.240	-.0546876	.2182539
acquirermarkettobook	.0003608	.0007058	0.51	0.609	-.0010235	.0017451

Second distress measure

Short-term

Source	SS	df	MS	Number of obs	=	2,290
				F(428, 1861)	=	1.87
Model	1.89891504	428	.004436717	Prob > F	=	0.0000
Residual	4.40687932	1,861	.002368017	R-squared	=	0.3011
				Adj R-squared	=	0.1404
Total	6.30579437	2,289	.002754825	Root MSE	=	.04866

car	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
distress2experience	-.0000418	.0000971	-0.43	0.667	-.0002323	.0001486
experience	-.0000139	.0000775	-0.18	0.858	-.000166	.0001382
distress2	.0062514	.0025722	2.43	0.015	.0012068	.011296
acquirertangibilitycontrol	.0054311	.0082033	0.66	0.508	-.0106575	.0215198
acquirerleveragecontrol	.0055859	.0073637	0.76	0.448	-.0088561	.0200279
targettangibilitycontrol	.0022174	.0065267	0.34	0.734	-.010583	.0150178
targetleveragecontrol	-.0084387	.0057182	-1.48	0.140	-.0196535	.0027761
acquirertobinsq	.0025152	.0010711	2.35	0.019	.0004145	.0046159
allstocks	-.0019837	.0057966	-0.34	0.732	-.0133523	.0093849
allcash	-.0013389	.004151	-0.32	0.747	-.0094799	.0068022
initialstake	-.0274041	.0136623	-2.01	0.045	-.0541991	-.0006091
acquirermarkettobook	.0002471	.0001429	1.73	0.084	-.0000332	.0005274

Long-term

Source	SS	df	MS	Number of obs	=	2,198
				F(421, 1776)	=	0.66
Model	20.469144	421	.048620295	Prob > F	=	1.0000
Residual	130.882123	1,776	.073694889	R-squared	=	0.1352
				Adj R-squared	=	-0.0697
Total	151.351267	2,197	.068889971	Root MSE	=	.27147

bhar	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
distress2experience	-.0001428	.0005495	-0.26	0.795	-.0012205	.000935
experience	-.0000665	.0004403	-0.15	0.880	-.00093	.0007969
distress2	.0290171	.0147445	1.97	0.049	.0000988	.0579354
acquirertangibilitycontrol	-.0806792	.0468646	-1.72	0.085	-.1725947	.0112364
acquirerleveragecontrol	-.0368938	.0420272	-0.88	0.380	-.1193217	.0455342
targettangibilitycontrol	.0122742	.0374928	0.33	0.743	-.0612604	.0858089
targetleveragecontrol	-.0400849	.0324941	-1.23	0.218	-.1038156	.0236458
acquirertobinsq	.0121616	.0065279	1.86	0.063	-.0006415	.0249647
allstocks	-.0313875	.0340323	-0.92	0.357	-.0981351	.0353602
allcash	-.0167122	.0240822	-0.69	0.488	-.0639446	.0305201
initialstake	.0809106	.0783267	1.03	0.302	-.0727116	.2345329
acquirermarkettobook	.00032	.0008116	0.39	0.693	-.0012717	.0019118

Appendix 13 – Regressions eleventh hypothesis

First distress measure

Short-term

Source	SS	df	MS	Number of obs	=	1,879
				F(415, 1463)	=	1.96
Model	1.83572787	415	.004423441	Prob > F	=	0.0000
Residual	3.30581426	1,463	.002259613	R-squared	=	0.3570
				Adj R-squared	=	0.1747
Total	5.14154213	1,878	.002737775	Root MSE	=	.04754

car	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
distress1size	-.0001169	.0002789	-0.42	0.675	-.000664	.0004303
size	-.0000972	.0001198	-0.81	0.417	-.0003322	.0001379
distress1	.0060826	.0032222	1.89	0.059	-.0002379	.0124031
acquirertangibilitycontrol	.0084985	.009181	0.93	0.355	-.0095108	.0265078
acquirerleveragecontrol	.0017653	.0077616	0.23	0.820	-.0134598	.0169904
targettangibilitycontrol	.0008742	.0073609	0.12	0.905	-.0135648	.0153132
targetleveragecontrol	-.0122816	.0068362	-1.80	0.073	-.0256914	.0011283
acquirertobinsq	.0023826	.001225	1.95	0.052	-.0000203	.0047856
allstocks	.0021456	.006451	0.33	0.739	-.0105085	.0147998
allcash	-.0037329	.0045747	-0.82	0.415	-.0127066	.0052407
initialstake	-.0268883	.014847	-1.81	0.070	-.0560119	.0022354
acquirermarkettobook	.0002408	.0001485	1.62	0.105	-.0000505	.000532

Long-term

Source	SS	df	MS	Number of obs	=	1,797
				F(406, 1390)	=	0.78
Model	18.7225054	406	.046114545	Prob > F	=	0.9988
Residual	82.1555794	1,390	.059104733	R-squared	=	0.1856
				Adj R-squared	=	-0.0523
Total	100.878085	1,796	.056168199	Root MSE	=	.24311

bhar	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
distress1size	.0006498	.0014301	0.45	0.650	-.0021557	.0034552
size	.0005841	.0006149	0.95	0.342	-.0006221	.0017903
distress1	-.0124546	.0169469	-0.73	0.463	-.0456989	.0207897
acquirertangibilitycontrol	-.1004048	.0481513	-2.09	0.037	-.1948617	-.0059478
acquirerleveragecontrol	-.0522356	.0406341	-1.29	0.199	-.1319464	.0274751
targettangibilitycontrol	.0074473	.0386486	0.19	0.847	-.0683685	.0832631
targetleveragecontrol	-.0095638	.0358227	-0.27	0.790	-.0798361	.0607086
acquirertobinsq	.0057633	.0066	0.87	0.383	-.0071838	.0187104
allstocks	-.033704	.0348668	-0.97	0.334	-.1021012	.0346933
allcash	-.0155022	.024523	-0.63	0.527	-.0636082	.0326038
initialstake	.0830977	.0785243	1.06	0.290	-.0709412	.2371366
acquirermarkettobook	.0004048	.0007741	0.52	0.601	-.0011137	.0019233

Second distress measure

Short-term

Source	SS	df	MS	Number of obs	=	1,924
				F(418, 1505)	=	2.28
Model	2.20698671	418	.005279873	Prob > F	=	0.0000
Residual	3.48769068	1,505	.002317402	R-squared	=	0.3876
				Adj R-squared	=	0.2175
Total	5.69467739	1,923	.002961351	Root MSE	=	.04814

car	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
distress2size	-.0001012	.0002498	-0.41	0.686	-.0005912	.0003889
size	-.0000883	.0001261	-0.70	0.484	-.0003356	.000159
distress2	.0059235	.0027931	2.12	0.034	.0004448	.0114023
acquirertangibilitycontrol	.0109548	.0091184	1.20	0.230	-.0069312	.0288409
acquirerleveragecontrol	.0038506	.0077794	0.49	0.621	-.0114091	.0191103
targettangibilitycontrol	.0005172	.0073108	0.07	0.944	-.0138233	.0148576
targetleveragecontrol	-.0108753	.0059918	-1.82	0.070	-.0226285	.0008778
acquirertobinsq	.0025305	.00122	2.07	0.038	.0001374	.0049236
allstocks	.0026032	.0063844	0.41	0.684	-.0099201	.0151265
allcash	-.0036149	.0045726	-0.79	0.429	-.0125842	.0053543
initialstake	-.030599	.0148251	-2.06	0.039	-.0596791	-.0015188
acquirermarkettobook	.000238	.00015	1.59	0.113	-.0000562	.0005321

Long-term

Source	SS	df	MS	Number of obs	=	1,842
				F(409, 1432)	=	0.63
Model	21.1996916	409	.051832987	Prob > F	=	1.0000
Residual	117.025463	1,432	.081721692	R-squared	=	0.1534
				Adj R-squared	=	-0.0884
Total	138.225155	1,841	.075081561	Root MSE	=	.28587

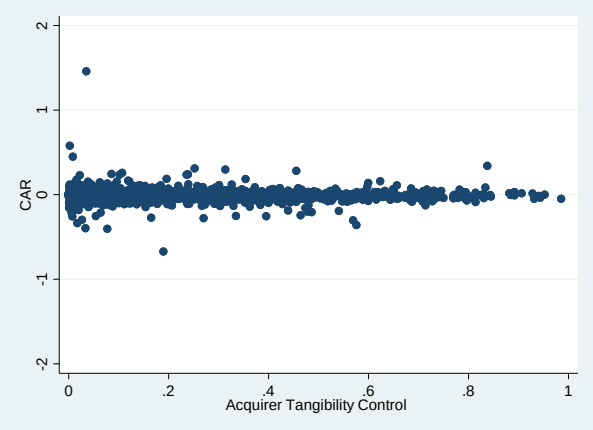
bhar	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
distress2size	.0005913	.0014885	0.40	0.691	-.0023285	.0035111
size	.0004477	.0007511	0.60	0.551	-.0010257	.001921
distress2	.0252735	.0170502	1.48	0.138	-.0081725	.0587195
acquirertangibilitycontrol	-.0976531	.0555148	-1.76	0.079	-.2065521	.0112459
acquirerleveragecontrol	-.0569969	.0472732	-1.21	0.228	-.149729	.0357353
targettangibilitycontrol	-.0014289	.0445004	-0.03	0.974	-.0887218	.0858641
targetleveragecontrol	-.0181738	.0363139	-0.50	0.617	-.0894078	.0530603
acquirertobinsq	.0074502	.0076171	0.98	0.328	-.0074916	.022392
allstocks	-.039691	.0399615	-0.99	0.321	-.1180804	.0386984
allcash	-.020197	.0284282	-0.71	0.478	-.0759623	.0355684
initialstake	.0688553	.0909505	0.76	0.449	-.1095553	.2472659
acquirermarkettobook	.0003044	.000908	0.34	0.738	-.0014767	.0020854

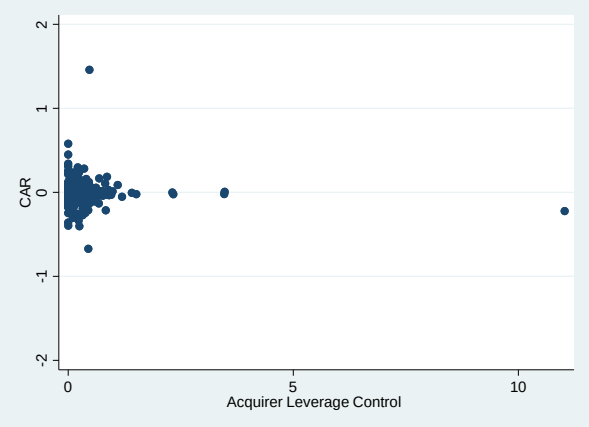
Appendix 14 – Assumptions control variables

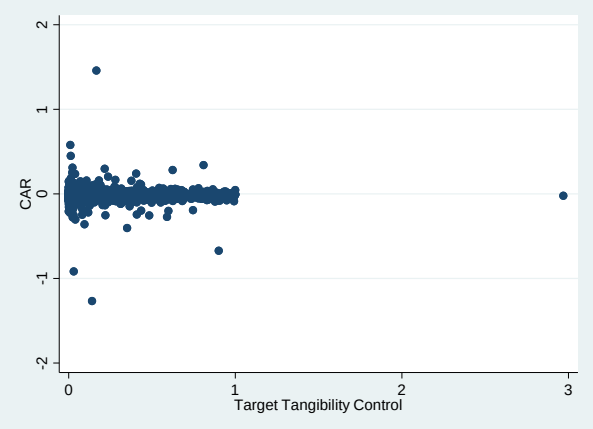
Assumption two will first be tested since it is the same for the control variables through all hypothesis. They are examined first so they do not need to be examined in every of the hypotheses.

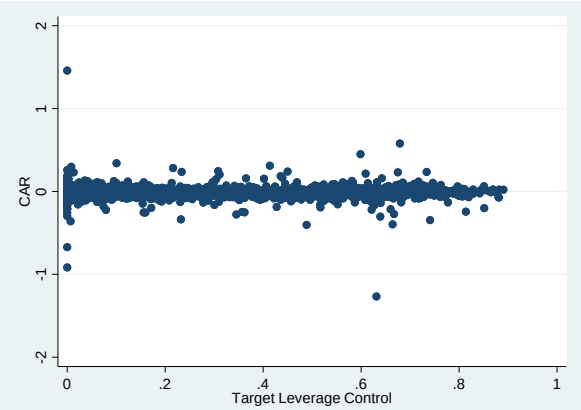
Short-term

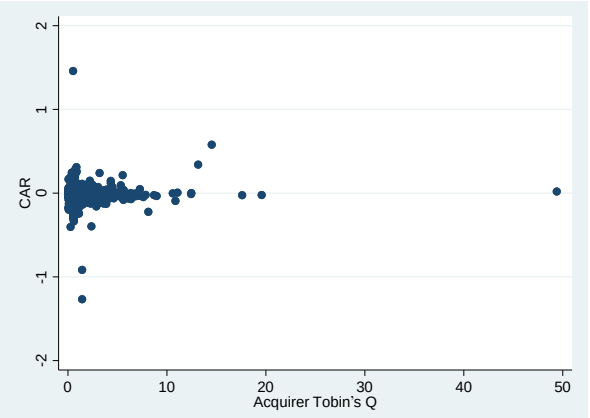
The first assumption is that there should be a linear relationship between the dependent and independent variables. These variables will be used through all the analysis why they are examined first and will not be discussed later in the sections. As seen in the scatter plots below there is approximately a linear relationship between the dependent variable and the control variables.

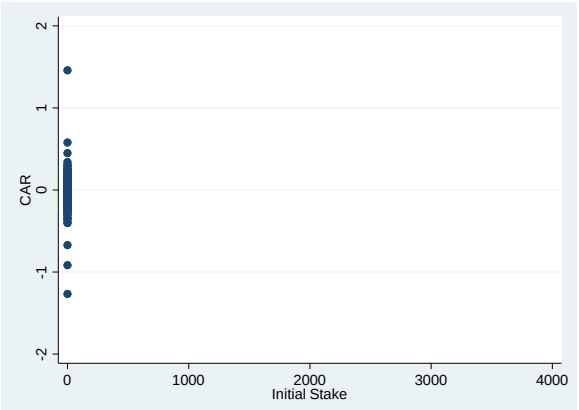


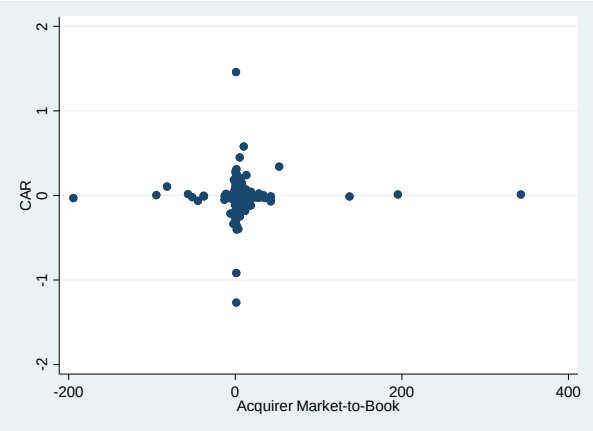






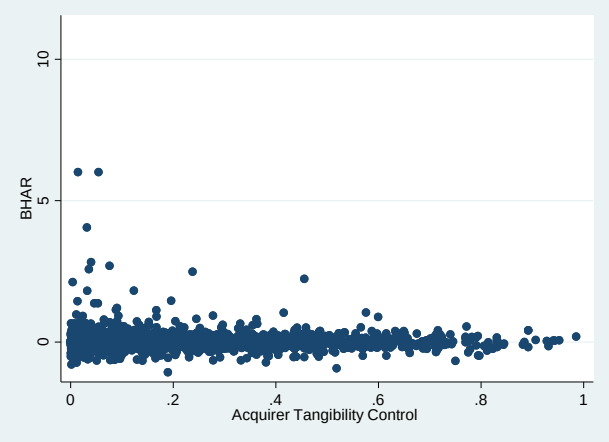


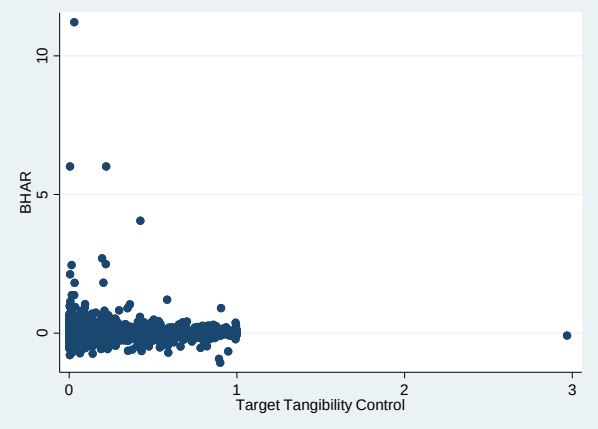


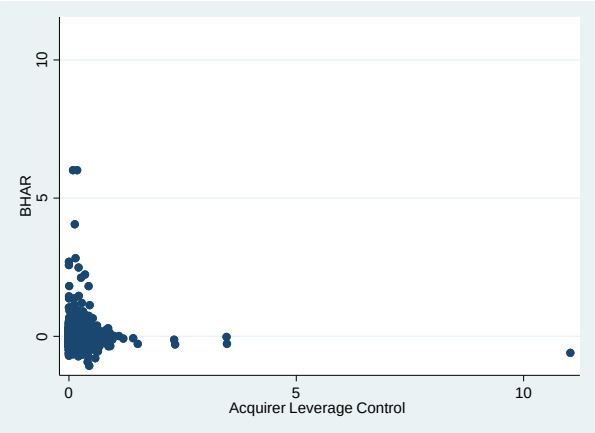


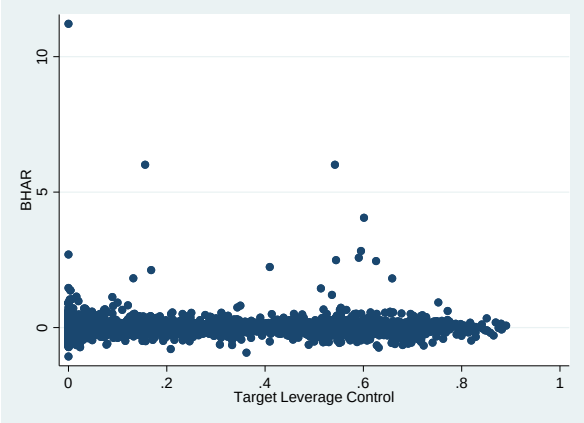
Long-term

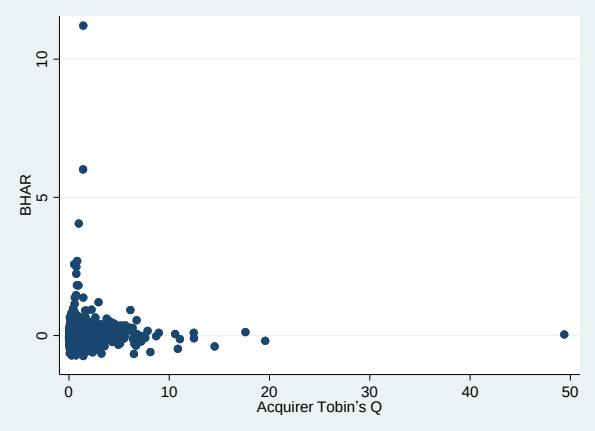
The second assumption is that there should be a linear relationship between the dependent and independent variables. These variables will be used through all the analysis why they are examined first and will not be discussed later in the sections. As seen in the scatter plots below there is approximately a linear relationship between the dependent variable and the control variables. The control variable acquirer market-to-book however seems to not have a perfectly linear relationship. It is not seen as a big issue since it is quite close to be linear.

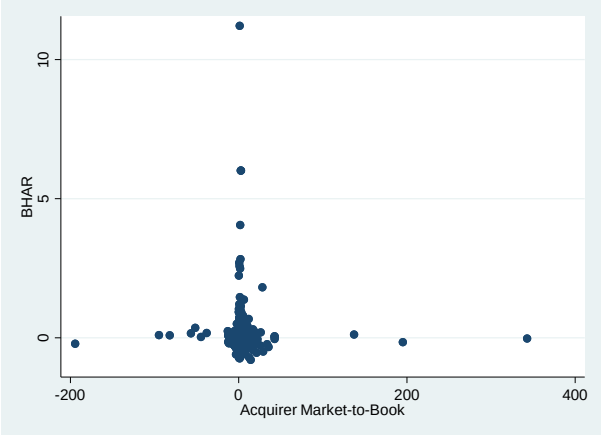


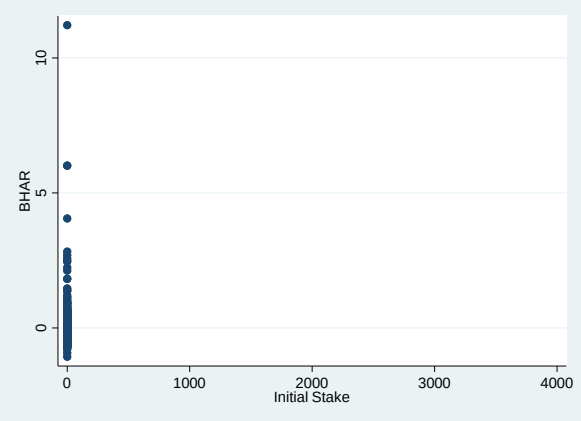












Appendix 15 – Assumptions first hypothesis

Assumption 1

As described in section 4.6.1 this hypothesis is automatically satisfied.

Assumption 2

As described in section 4.6.1 this assumption is automatically satisfied since the only independent variable besides control variables is a dummy variable.

Assumption 3 short-term

Distress measure 1

As seen in the jaque-bera test below, the null hypothesis is rejected. This means that the error term is not normally distributed. This assumption is therefore violated. A way to overcome the non-normality of the residuals is by making log-transformations. However, it did not help on the normality assumption nor changed the conclusions why the results listed in the paper will be the original ones.

```
. sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                              ------ joint ------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+---------------------------------------------------------------
   residuals |      2,230      0.0000        0.0000          .              .

.
end of do-file
```

As seen in the Breusch-Pagan test below the null hypothesis is rejected. This means that there is heteroscedasticity. The assumptions of homogeneus variance is therefore not fulfilled. Heteroscedacity does not bias the coefficients but tend to make them less precise. This means that they are further away from the correct population value. Furthermore, heteroscedacity is associated with lower p-values. This potentially bias the results.

```
Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of car

         chi2(1)      = 44775.84
         Prob > chi2  =   0.0000

.
end of do-file
```

Distress measure 2

As seen in the jaque-bera test below, the null hypothesis is rejected. This means that the error term is not normally distributed. This assumption is therefore violated. A way to overcome the non-normality of the residuals is by making log-transformations. However, it did not help on the normality assumption nor changed the conclusions why the results listed in the paper will be the original ones.

```
. sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                              ------- joint -------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------------
   residuals |      2,290      0.0000        0.0000           .              .

.
end of do-file
```

As seen in the Breusch-Pagan test below the null hypothesis is rejected. This means that there is heteroscedasticity. The assumptions of homogeneus variance is therefore not fulfilled. Heteroscedacity does not bias the coefficients but tend to make them less precise. This means that they are further away from the correct population value. Furthermore, heteroscedacity is associated with lower p-values. This potentially bias the results.

```
.         hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of car

         chi2(1)      = 32577.70
         Prob > chi2  =   0.0000

.
end of do-file
```

Assumption 3 long-term

Distress measure 1:

As seen in the jaque-bera test below, the null hypothesis is rejected. This means that the error term is not normally distributed. This assumption is therefore violated. A way to overcome the non-normality of the residuals is by making log-transformations. However, it did not help on the normality assumption nor changed the conclusions why the results listed in the paper will be the original ones.

```
.                          sktest residuals

                 Skewness/Kurtosis tests for Normality
                                                    ------- joint -------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------
   residuals |      2,138      0.0000        0.0000          .              .

.
end of do-file
```

As seen in the Breusch-Pagan test below the null hypothesis is rejected. This means that there is heteroscedasticity. The assumptions of homogeneus variance is therefore not fulfilled. Heteroscedacity does not bias the coefficients but tend to make them less precise. This means that they are further away

from the correct population value. Furthermore, heteroscedacity is associated with lower p-values. This potentially bias the results.

```
.          hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of bhar

         chi2(1)      =    942.72
         Prob > chi2  =    0.0000

.
end of do-file
```

Distress measure 2:

As seen in the jaque-bera test below, the null hypothesis is rejected. This means that the error term is not normally distributed. This assumption is therefore violated. A way to overcome the non-normality of the residuals is by making log-transformations. However, it did not help on the normality assumption nor changed the conclusions why the results listed in the paper will be the original ones.

```
.                                  sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                              ------ joint ------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+---------------------------------------------------------------
   residuals |      2,198      0.0000        0.0000          .              .

.
end of do-file
```

As seen in the Breusch-Pagan test below the null hypothesis is rejected. This means that there is heteroscedasticity. The assumptions of homogeneus variance is therefore not fulfilled. Heteroscedacity does not bias the coefficients but tend to make them less precise. This means that they are further away from the correct population value. Furthermore, heteroscedacity is associated with lower p-values. This potentially bias the results.

```
.         hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of bhar

         chi2(1)      =  2326.25
         Prob > chi2  =   0.0000

.
end of do-file
```

Assumption 4 short-term

Distress measure 1:

The fourth assumption states that the error terms are independent of each other. The null hypothesis, which states that there is no first lag autocorrelation, is rejected. This means that this assumption is not fulfilled. This bias the standard errors and makes the results less efficient. It does not affect the coefficients. When auto correlation is present the t-statistics tends to be higher, because of underestimated standard errors.

```
.            estat dwatson

Number of gaps in sample:  2221

Durbin-Watson d-statistic(424,  2230) =  .0032678

.
end of do-file
```

Distress measure 2:

The fourth assumption states that the error terms are independent of each other. The null hypothesis, which states that there is no first lag autocorrelation, is rejected. This means that this assumption is not fulfilled. This bias the standard errors and makes the results less efficient. It does not affect the

coefficients. When auto correlation is present the t-statistics tends to be higher, because of underestimated standard errors.

```
.            estat dwatson

Number of gaps in sample:  2281

Durbin-Watson d-statistic(427,  2290) =  .0024199

.
end of do-file
```

Assumption 4 long-term

Distress measure 1:

The fourth assumption states that the error terms are independent of each other. The null hypothesis, which states that there is no first lag autocorrelation, is rejected. This means that this assumption is not fulfilled. This bias the standard errors and makes the results less efficient. It does not affect the coefficients. When auto correlation is present the t-statistics tends to be higher, because of underestimated standard errors.

```
.            estat dwatson

Number of gaps in sample:  2131

Durbin-Watson d-statistic(417,  2138) =   .019495

.
end of do-file
```

Distress measure 2:

The fourth assumption states that the error terms are independent of each other. The null hypothesis, which states that there is no first lag autocorrelation, is rejected. This means that this assumption is not fulfilled. This bias the standard errors and makes the results less efficient. It does not affect the coefficients. When auto correlation is present the t-statistics tends to be higher, because of underestimated standard errors.

```
.            estat dwatson

Number of gaps in sample:  2191

Durbin-Watson d-statistic(420,  2198) =  .0144201

.
end of do-file
```

Assumption 5 Short-term

Distress measure 1

As seen in appendix 2 sheet 2 – VIF it is only the independent variables to control for fixed-effect which have a too high VIF. The fixed-effects have been removed but it did not change the conclusions why the original regression output have been maintained.

Distress measure 2

As seen in appendix 2 sheet 2 – VIF it is only the independent variables to control for fixed-effect which have a too high VIF. The fixed-effects have been removed but it did not change the conclusions why the original regression output have been maintained.

Assumption 5 Long-term

Distress measure 1

As seen in appendix 2 sheet 2 – VIF it is only the independent variables to control for fixed-effect which have a too high VIF. The fixed-effects have been removed but it did not change the conclusions why the original regression output have been maintained.

Distress measure 2

As seen in appendix 2 sheet 2 – VIF it is only the independent variables to control for fixed-effect which have a too high VIF. The fixed-effects have been removed but it did not change the conclusions why the original regression output have been maintained.

Appendix 16 – Assumptions second hypothesis

Assumption 1

As described in section 4.6.1 this hypothesis is automatically satisfied.

Assumption 2

As described in section .6.1 this assumption is automatically satisfied since the independent variables besides control variables is dummy variables.

Assumption 3 short-term

Distress measure 1

As seen in the jaque-bera test below, the null hypothesis is rejected. This means that the error term is not normally distributed. This assumption is therefore violated. A way to overcome the non-normality of the residuals is by making log-transformations. However, it did not help on the normality assumption nor changed the conclusions why the results listed in the paper will be the original ones.

```
. sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                              ------- joint -------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------------
   residuals |      2,230      0.0000        0.0000          .              .

.
end of do-file
```

As seen in the Breusch-Pagan test below the null hypothesis is rejected. This means that there is heteroscedasticity. The assumptions of homogeneus variance is therefore not fulfilled. Heteroscedacity does not bias the coefficients but tend to make them less precise. This means that they are further away from the correct population value. Furthermore, heteroscedacity is associated with lower p-values. This potentially bias the results.

```
. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of car

         chi2(1)      = 43997.32
         Prob > chi2  =   0.0000

.
end of do-file
```

Distress measure 2

As seen in the jaque-bera test below, the null hypothesis is rejected. This means that the error term is not normally distributed. This assumption is therefore violated. A way to overcome the non-normality of the residuals is by making log-transformations. However, it did not help on the normality assumption nor changed the conclusions why the results listed in the paper will be the original ones.

```
. sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                              ------- joint -------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------------
   residuals |      2,290      0.0000        0.0000          .              .

.
end of do-file
```

As seen in the Breusch-Pagan test below the null hypothesis is rejected. This means that there is heteroscedasticity. The assumptions of homogeneus variance is therefore not fulfilled. Heteroscedacity does not bias the coefficients but tend to make them less precise. This means that they are further away from the correct population value. Furthermore, heteroscedacity is associated with lower p-values. This potentially bias the results.

```
. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of car

         chi2(1)      = 32156.58
         Prob > chi2  =   0.0000

.
end of do-file
```

Assumption 3 long-term

Distress measure 1

As seen in the jaque-bera test below, the null hypothesis is rejected. This means that the error term is not normally distributed. This assumption is therefore violated. A way to overcome the non-normality of the residuals is by making log-transformations. However, it did not help on the normality assumption nor changed the conclusions why the results listed in the paper will be the original ones.

```
. sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                              ------- joint -------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------------
   residuals |      2,138      0.0000        0.0000          .              .

.
end of do-file
```

As seen in the Breusch-Pagan test below the null hypothesis is rejected. This means that there is heteroscedasticity. The assumptions of homogeneus variance is therefore not fulfilled. Heteroscedacity does not bias the coefficients but tend to make them less precise. This means that they are further away from the correct population value. Furthermore, heteroscedacity is associated with lower p-values. This potentially bias the results.

```
. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of bhar

         chi2(1)      =   972.21
         Prob > chi2  =   0.0000

.
end of do-file
```

Distress measure 2

As seen in the jaque-bera test below, the null hypothesis is rejected. This means that the error term is not normally distributed. This assumption is therefore violated. A way to overcome the non-normality of the residuals is by making log-transformations. However, it did not help on the normality assumption nor changed the conclusions why the results listed in the paper will be the original ones.

```
. sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                              ------- joint -------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------------
   residuals |      2,198      0.0000        0.0000          .              .

.
end of do-file
```

As seen in the Breusch-Pagan test below the null hypothesis is rejected. This means that there is heteroscedasticity. The assumptions of homogeneus variance is therefore not fulfilled. Heteroscedacity does not bias the coefficients but tend to make them less precise. This means that they are further away from the correct population value. Furthermore, heteroscedacity is associated with lower p-values. This potentially bias the results.

```
. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of bhar

         chi2(1)      =  2379.84
         Prob > chi2  =   0.0000

.
end of do-file
```

Assumption 4 short-term

Distress measure 1:

The fourth assumption states that the error terms are independent of each other. The null hypothesis, which states that there is no first lag autocorrelation, is rejected. This means that this assumption is not fulfilled. This bias the standard errors and makes the results less efficient. It does not affect the coefficients. When auto correlation is present the t-statistics tends to be higher, because of underestimated standard errors.

```
.            estat dwatson

Number of gaps in sample:  2221

Durbin-Watson d-statistic(425,  2230) =  .0029503

.
end of do-file
```

Distress measure 2:

The fourth assumption states that the error terms are independent of each other. The null hypothesis, which states that there is no first lag autocorrelation, is rejected. This means that this assumption is not fulfilled. This bias the standard errors and makes the results less efficient. It does not affect the coefficients. When auto correlation is present the t-statistics tends to be higher, because of underestimated standard errors.

```
.            estat dwatson

Number of gaps in sample:  2281

Durbin-Watson d-statistic(429,  2290) =  .0023356

.
end of do-file
```

Assumption 4 long-term

Distress measure 1

The fourth assumption states that the error terms are independent of each other. The null hypothesis, which states that there is no first lag autocorrelation, is rejected. This means that this assumption is not fulfilled. This bias the standard errors and makes the results less efficient. It does not affect the coefficients. When auto correlation is present the t-statistics tends to be higher, because of underestimated standard errors.

```
.            estat dwatson

Number of gaps in sample:  2131

Durbin-Watson d-statistic(418,  2138) =  .0193931

.
end of do-file
```

Distress measure 2

The fourth assumption states that the error terms are independent of each other. The null hypothesis, which states that there is no first lag autocorrelation, is rejected. This means that this assumption is not fulfilled. This bias the standard errors and makes the results less efficient. It does not affect the coefficients. When auto correlation is present the t-statistics tends to be higher, because of underestimated standard errors.

```
.            estat dwatson

Number of gaps in sample:  2191

Durbin-Watson d-statistic(422,  2198) =  .0145663

.
end of do-file
```

Assumption 5 Short-term

Distress measure 1

As seen in appendix 2 sheet 2 – VIF it is only the independent variables to control for fixed-effect which have a too high VIF. The fixed-effects have been removed but it did not change the conclusions why the original regression output have been maintained.

Distress measure 2

As seen in appendix 2 sheet 2 – VIF it is only the independent variables to control for fixed-effect which have a too high VIF. The fixed-effects have been removed but it did not change the conclusions why the original regression output have been maintained.

Assumption 5 Long-term

Distress measure 1

As seen in appendix 2 sheet 2 – VIF it is only the independent variables to control for fixed-effect which have a too high VIF. The fixed-effects have been removed but it did not change the conclusions why the original regression output have been maintained.

Distress measure 2

As seen in appendix 2 sheet 2 – VIF it is only the independent variables to control for fixed-effect which have a too high VIF. The fixed-effects have been removed but it did not change the conclusions why the original regression output have been maintained.

Appendix 17 – Assumptions third hypothesis

Assumption 1

Distress measure 1

As seen in appendix 2 sheet 2 – VIF it is only the independent variables to control for fixed-effect which have a too high VIF. The fixed-effects have been removed but it did not change the conclusions why the original regression output have been maintained.

Distress measure 2

As seen in appendix 2 sheet 2 – VIF it is only the independent variables to control for fixed-effect which have a too high VIF. The fixed-effects have been removed but it did not change the conclusions why the original regression output have been maintained.

Assumption 2

As described in section 4.6.2 this assumption is automatically satisfied since because the independent variable is binary.

Assumption 3

Distress measure 1

The third states that the error terms are independent of each other. The null hypothesis, which states that there is no first lag autocorrelation, is rejected. This means that this assumption is not fulfilled. This bias the standard errors and makes the results less efficient. It does not affect the coefficients. When auto correlation is present the t-statistics tends to be higher, because of underestimated standard errors.

```
.                 estat dwatson

Number of gaps in sample:  2221

Durbin-Watson d-statistic(425,  2230) =    .008832

.
end of do-file
```

Distress measure 2

The third states that the error terms are independent of each other. The null hypothesis, which states that there is no first lag autocorrelation, is rejected. This means that this assumption is not fulfilled. This bias the standard errors and makes the results less efficient. It does not affect the coefficients. When auto correlation is present the t-statistics tends to be higher, because of underestimated standard errors.

```
.                 estat dwatson

Number of gaps in sample:  2281

Durbin-Watson d-statistic(429,  2290) =   .0087452

.
end of do-file
```

Assumption 4

Distress measure 1

As seen in the jaque-bera test below, the null hypothesis is rejected. This means that the error term is not normally distributed. This assumption is therefore violated. A way to overcome the non-normality of the

residuals is by making log-transformations. However, it did not help on the normality assumption nor changed the conclusions why the results listed in the paper will be the original ones.

```
. sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                              ------ joint ------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------------
   residuals |      2,230        0.0000        0.7142       20.15        0.0000

.
end of do-file
```

Distress measure 2

As seen in the jaque-bera test below, the null hypothesis is rejected. This means that the error term is not normally distributed. This assumption is therefore violated. A way to overcome the non-normality of the residuals is by making log-transformations. However, it did not help on the normality assumption nor changed the conclusions why the results listed in the paper will be the original ones.

```
. sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                              ------ joint ------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------------
   residuals |      2,290        0.0000        0.7318       22.24        0.0000

.
end of do-file
```

Appendix 18 – Assumptions fourth hypothesis

Assumption 1

As described in section 4.6.1 this hypothesis is automatically satisfied.

Assumption 2

As described in section 4.6.1 this assumption is automatically satisfied since the only independent variable besides control variables is a dummy variable.

Assumption 3 short-term

Distress measure 1

As seen in the jaque-bera test below, the null hypothesis is rejected. This means that the error term is not normally distributed. This assumption is therefore violated. A way to overcome the non-normality of the residuals is by making log-transformations. However, it did not help on the normality assumption nor changed the conclusions why the results listed in the paper will be the original ones.

```
. sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                              ------ joint ------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------------
   residuals |      2,230      0.0000        0.0000           .              .

.
end of do-file
```

As seen in the Breusch-Pagan test below the null hypothesis is rejected. This means that there is heteroscedasticity. The assumptions of homogeneus variance is therefore not fulfilled. Heteroscedacity does not bias the coefficients but tend to make them less precise. This means that they are further away from the correct population value. Furthermore, heteroscedacity is associated with lower p-values. This potentially bias the results.

```
.          hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of car

         chi2(1)      = 43886.12
         Prob > chi2  =   0.0000

.
end of do-file
```

Distress measure 2

As seen in the jaque-bera test below, the null hypothesis is rejected. This means that the error term is not normally distributed. This assumption is therefore violated. A way to overcome the non-normality of the residuals is by making log-transformations. However, it did not help on the normality assumption nor changed the conclusions why the results listed in the paper will be the original ones.

```
.                              sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                              ------- joint -------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------------
   residuals |      2,290      0.0000        0.0000           .              .

.
end of do-file
```

As seen in the Breusch-Pagan test below the null hypothesis is rejected. This means that there is heteroscedasticity. The assumptions of homogeneus variance is therefore not fulfilled. Heteroscedacity does not bias the coefficients but tend to make them less precise. This means that they are further away from the correct population value. Furthermore, heteroscedacity is associated with lower p-values. This potentially bias the results.

```
.          hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of car

         chi2(1)      = 32093.97
         Prob > chi2  =   0.0000

.
end of do-file
```

Assumption 3 long-term

Distress measure 1

As seen in the jaque-bera test below, the null hypothesis is rejected. This means that the error term is not normally distributed. This assumption is therefore violated. A way to overcome the non-normality of the residuals is by making log-transformations. However, it did not help on the normality assumption nor changed the conclusions why the results listed in the paper will be the original ones.

```
.                                  sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                              ------- joint -------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+---------------------------------------------------------------------
   residuals |      2,138      0.0000        0.0000          .              .

.
end of do-file
```

As seen in the Breusch-Pagan test below the null hypothesis is rejected. This means that there is heteroscedasticity. The assumptions of homogeneus variance is therefore not fulfilled. Heteroscedacity does not bias the coefficients but tend to make them less precise. This means that they are further away from the correct population value. Furthermore, heteroscedacity is associated with lower p-values. This potentially bias the results.

```
.          hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of bhar

         chi2(1)      =    978.45
         Prob > chi2  =    0.0000

.
end of do-file
```

Distress measure 2

As seen in the jaque-bera test below, the null hypothesis is rejected. This means that the error term is not normally distributed. This assumption is therefore violated. A way to overcome the non-normality of the residuals is by making log-transformations. However, it did not help on the normality assumption nor changed the conclusions why the results listed in the paper will be the original ones.

```
.                                  sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                                ------- joint -------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------------
   residuals |      2,198      0.0000        0.0000           .              .

.
end of do-file
```

As seen in the Breusch-Pagan test below the null hypothesis is rejected. This means that there is heteroscedasticity. The assumptions of homogeneus variance is therefore not fulfilled. Heteroscedacity does not bias the coefficients but tend to make them less precise. This means that they are further away from the correct population value. Furthermore, heteroscedacity is associated with lower p-values. This potentially bias the results.

```
.         hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of bhar

         chi2(1)      =  2478.17
         Prob > chi2  =   0.0000

.
end of do-file
```

Assumption 4 short-term

Distress measure 1

The fourth assumption states that the error terms are independent of each other. The null hypothesis, which states that there is no first lag autocorrelation, is rejected. This means that this assumption is not fulfilled. This bias the standard errors and makes the results less efficient. It does not affect the coefficients. When auto correlation is present the t-statistics tends to be higher, because of underestimated standard errors.

```
.            estat dwatson

Number of gaps in sample:  2221

Durbin-Watson d-statistic(427,  2230) =  .0029569

.
end of do-file
```

Distress measure 2

The fourth assumption states that the error terms are independent of each other. The null hypothesis, which states that there is no first lag autocorrelation, is rejected. This means that this assumption is not fulfilled. This bias the standard errors and makes the results less efficient. It does not affect the coefficients. When auto correlation is present the t-statistics tends to be higher, because of underestimated standard errors.

```
.            estat dwatson

Number of gaps in sample:  2281

Durbin-Watson d-statistic(431,  2290) =  .0025027

.
end of do-file
```

Assumption 4 long-term

Distress measure 1

The fourth assumption states that the error terms are independent of each other. The null hypothesis, which states that there is no first lag autocorrelation, is rejected. This means that this assumption is not fulfilled. This bias the standard errors and makes the results less efficient. It does not affect the coefficients. When auto correlation is present the t-statistics tends to be higher, because of underestimated standard errors.

```
.            estat dwatson

Number of gaps in sample:  2131

Durbin-Watson d-statistic(420,  2138) =   .019494

.
end of do-file
```

Distress measure 2

The fourth assumption states that the error terms are independent of each other. The null hypothesis, which states that there is no first lag autocorrelation, is rejected. This means that this assumption is not fulfilled. This bias the standard errors and makes the results less efficient. It does not affect the coefficients. When auto correlation is present the t-statistics tends to be higher, because of underestimated standard errors.

```
.            estat dwatson

Number of gaps in sample:  2191

Durbin-Watson d-statistic(424,  2198) =  .0147558

.
end of do-file
```

Assumption 5 Short-term

Distress measure 1

As seen in appendix 2 sheet 2 – VIF it is only the independent variables to control for fixed-effect which have a too high VIF. The fixed-effects have been removed but it did not change the conclusions why the original regression output have been maintained.

Distress measure 2

As seen in appendix 2 sheet 2 – VIF it is only the independent variables to control for fixed-effect which have a too high VIF. The fixed-effects have been removed but it did not change the conclusions why the original regression output have been maintained.

Assumption 5 Long-term

Distress measure 1

As seen in appendix 2 sheet 2 – VIF it is only the independent variables to control for fixed-effect which have a too high VIF. The fixed-effects have been removed but it did not change the conclusions why the original regression output have been maintained.

Distress measure 2

As seen in appendix 2 sheet 2 – VIF it is only the independent variables to control for fixed-effect which have a too high VIF. The fixed-effects have been removed but it did not change the conclusions why the original regression output have been maintained.

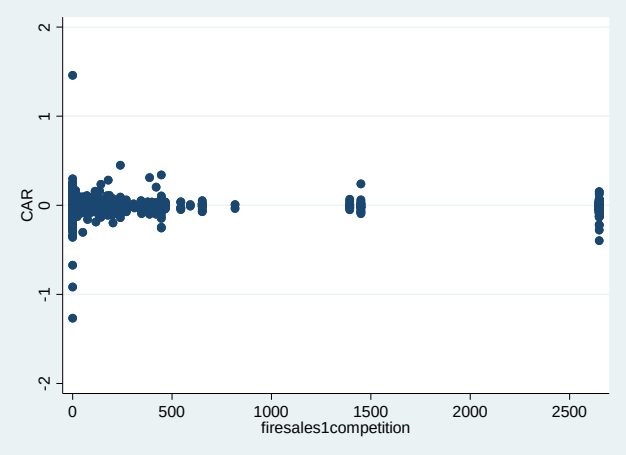
Appendix 19 – Assumptions fifth hypothesis

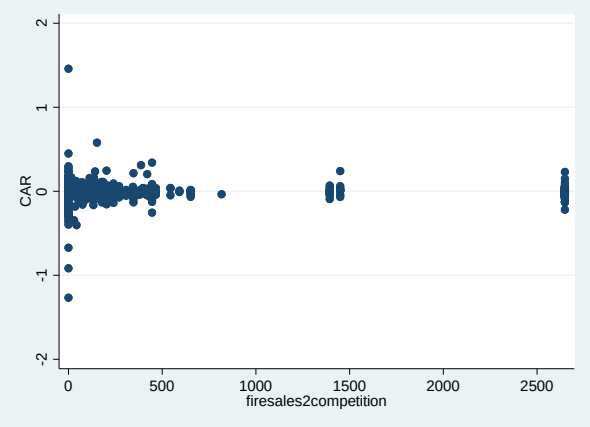
Assumption 1

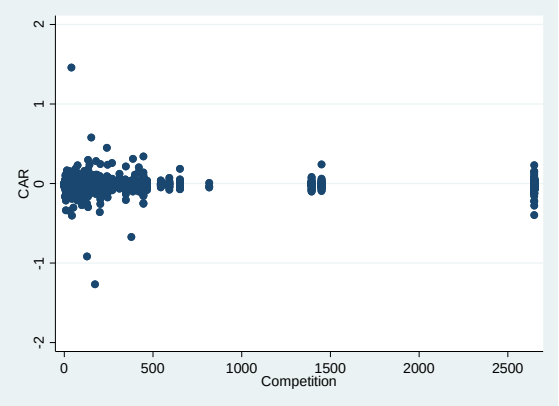
As described in section 4.6.1 this hypothesis is automatically satisfied.

Assumption 2 short-term

As seen in the scatterplots below there is an approximately linear relationship between the dependent and independent variables. Why this assumption is fulfilled.

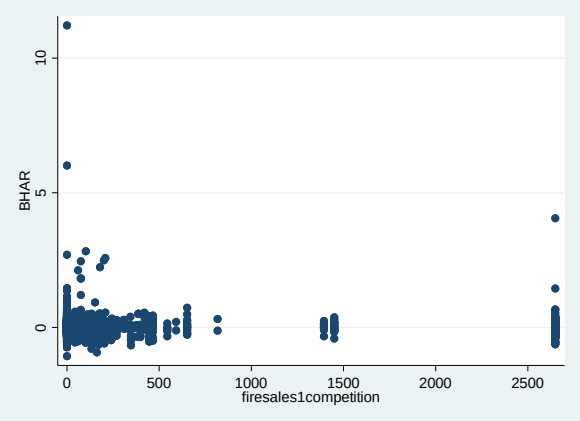


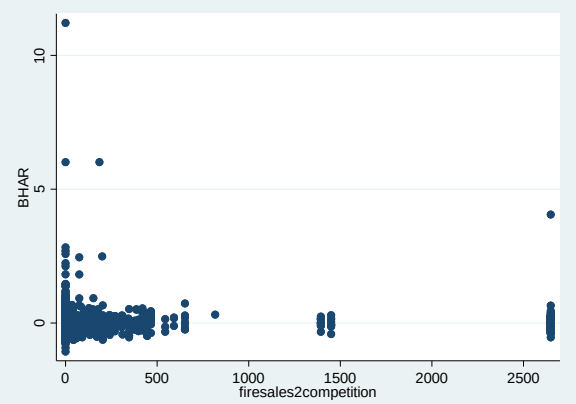


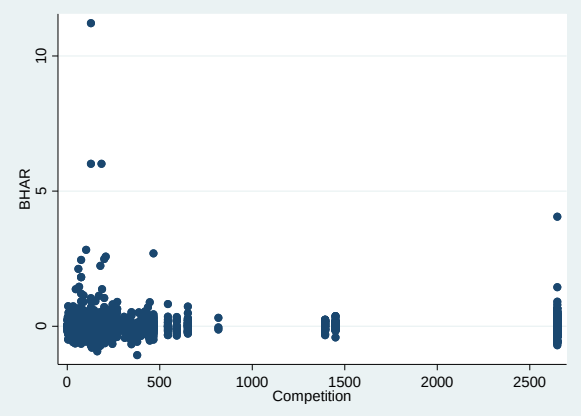


Assumption 2 long-term

As seen in the scatterplots below there is an approximately linear relationship between the dependent and independent variables. Why this assumption is fulfilled.







Assumption 3 short-term

Distress measure 1

As seen in the jaque-bera test below, the null hypothesis is rejected. This means that the error term is not normally distributed. This assumption is therefore violated. A way to overcome the non-normality of the residuals is by making log-transformations. However, it did not help on the normality assumption nor changed the conclusions why the results listed in the paper will be the original ones.

```
.                                  sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                              ------- joint -------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+---------------------------------------------------------------------
   residuals |      2,230      0.0000        0.0000          .              .

.
end of do-file
```

As seen in the Breusch-Pagan test below the null hypothesis is rejected. This means that there is heteroscedasticity. The assumptions of homogeneus variance is therefore not fulfilled. Heteroscedacity does not bias the coefficients but tend to make them less precise. This means that they are further away from the correct population value. Furthermore, heteroscedacity is associated with lower p-values. This potentially bias the results.

```
.         hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of car

         chi2(1)      = 43906.91
         Prob > chi2  =   0.0000

.
end of do-file
```

Distress measure 2

As seen in the jaque-bera test below, the null hypothesis is rejected. This means that the error term is not normally distributed. This assumption is therefore violated. A way to overcome the non-normality of the residuals is by making log-transformations. However, it did not help on the normality assumption nor changed the conclusions why the results listed in the paper will be the original ones.

```
.                                   sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                              ------ joint ------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------------
   residuals |      2,290      0.0000        0.0000           .              .

.
end of do-file
```

As seen in the Breusch-Pagan test below the null hypothesis is rejected. This means that there is heteroscedasticity. The assumptions of homogeneus variance is therefore not fulfilled. Heteroscedacity does not bias the coefficients but tend to make them less precise. This means that they are further away from the correct population value. Furthermore, heteroscedacity is associated with lower p-values. This potentially bias the results.

```
.          hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of car

         chi2(1)      = 32164.68
         Prob > chi2  =   0.0000

.
end of do-file
```

Assumption 3 long-term

Distress measure 1

As seen in the jaque-bera test below, the null hypothesis is rejected. This means that the error term is not normally distributed. This assumption is therefore violated. A way to overcome the non-normality of the residuals is by making log-transformations. However, it did not help on the normality assumption nor changed the conclusions why the results listed in the paper will be the original ones.

```
.                                  sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                                ------ joint ------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------------
   residuals |      2,138      0.0000        0.0000          .              .

.
end of do-file
```

As seen in the Breusch-Pagan test below the null hypothesis is rejected. This means that there is heteroscedasticity. The assumptions of homogeneus variance is therefore not fulfilled. Heteroscedacity does not bias the coefficients but tend to make them less precise. This means that they are further away from the correct population value. Furthermore, heteroscedacity is associated with lower p-values. This potentially bias the results.

```
.          hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of bhar

         chi2(1)      =    952.78
         Prob > chi2  =    0.0000

.
end of do-file
```

Distress measure 2

As seen in the jaque-bera test below, the null hypothesis is rejected. This means that the error term is not normally distributed. This assumption is therefore violated. A way to overcome the non-normality of the residuals is by making log-transformations. However, it did not help on the normality assumption nor changed the conclusions why the results listed in the paper will be the original ones.

```
.                                  sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                                ------- joint -------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------------
   residuals |      2,198      0.0000        0.0000           .             .

.
end of do-file
```

As seen in the Breusch-Pagan test below the null hypothesis is rejected. This means that there is heteroscedasticity. The assumptions of homogeneus variance is therefore not fulfilled. Heteroscedacity does not bias the coefficients but tend to make them less precise. This means that they are further away from the correct population value. Furthermore, heteroscedacity is associated with lower p-values. This potentially bias the results.

```
.          hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of bhar

         chi2(1)      =  2365.56
         Prob > chi2  =   0.0000

.
end of do-file
```

Assumption 4 short-term

Distress measure 1

The fourth assumption states that the error terms are independent of each other. The null hypothesis, which states that there is no first lag autocorrelation, is rejected. This means that this assumption is not fulfilled. This bias the standard errors and makes the results less efficient. It does not affect the coefficients. When auto correlation is present the t-statistics tends to be higher, because of underestimated standard errors.

```
.            estat dwatson

Number of gaps in sample:  2221

Durbin-Watson d-statistic(427,  2230) =  .0027932

.
end of do-file
```

Distress measure 2

The fourth assumption states that the error terms are independent of each other. The null hypothesis, which states that there is no first lag autocorrelation, is rejected. This means that this assumption is not fulfilled. This bias the standard errors and makes the results less efficient. It does not affect the coefficients. When auto correlation is present the t-statistics tends to be higher, because of underestimated standard errors.

```
.             estat dwatson

Number of gaps in sample:  2281

Durbin-Watson d-statistic(431,  2290) =  .0024525

.
end of do-file
```

Assumption 4 long-term

Distress measure 1

The fourth assumption states that the error terms are independent of each other. The null hypothesis, which states that there is no first lag autocorrelation, is rejected. This means that this assumption is not fulfilled. This bias the standard errors and makes the results less efficient. It does not affect the coefficients. When auto correlation is present the t-statistics tends to be higher, because of underestimated standard errors.

```
.             estat dwatson

Number of gaps in sample:  2131

Durbin-Watson d-statistic(420,  2138) =  .0193491

.
end of do-file
```

Distress measure 2

The fourth assumption states that the error terms are independent of each other. The null hypothesis, which states that there is no first lag autocorrelation, is rejected. This means that this assumption is not fulfilled. This bias the standard errors and makes the results less efficient. It does not affect the coefficients. When auto correlation is present the t-statistics tends to be higher, because of underestimated standard errors.

```
.            estat dwatson

Number of gaps in sample:  2191

Durbin-Watson d-statistic(424,  2198) =    .014282

.
```

Assumption 5 Short-term

Distress measure 1

As seen in appendix 2 sheet 2 – VIF it is only the independent variables to control for fixed-effect which have a too high VIF. The fixed-effects have been removed but it did not change the conclusions why the original regression output have been maintained.

Distress measure 2

As seen in appendix 2 sheet 2 – VIF it is only the independent variables to control for fixed-effect which have a too high VIF. The fixed-effects have been removed but it did not change the conclusions why the original regression output have been maintained.

Assumption 5 Long-term

Distress measure 1

As seen in appendix 2 sheet 2 – VIF it is only the independent variables to control for fixed-effect which have a too high VIF. The fixed-effects have been removed but it did not change the conclusions why the original regression output have been maintained.

Distress measure 2

As seen in appendix 2 sheet 2 – VIF it is only the independent variables to control for fixed-effect which have a too high VIF. The fixed-effects have been removed but it did not change the conclusions why the original regression output have been maintained.

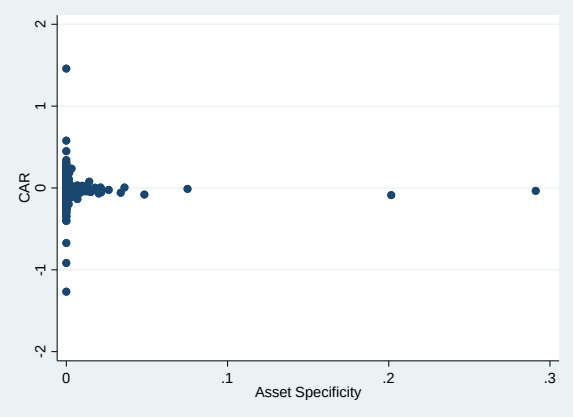
Appendix 20 – Assumptions sixth hypothesis

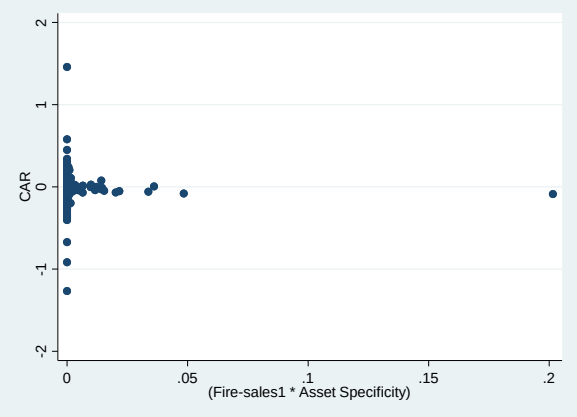
Assumption 1

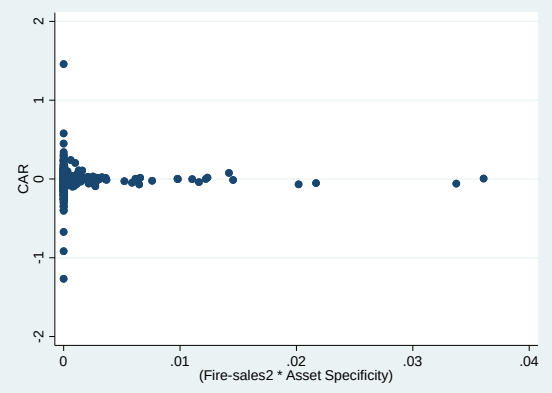
As described in section 4.6.1 this hypothesis is automatically satisfied.

Assumption 2 Short-term

As seen in the scatterplots below there is a linear relationship between the dependent and independent variables. Why this assumption is fulfilled.

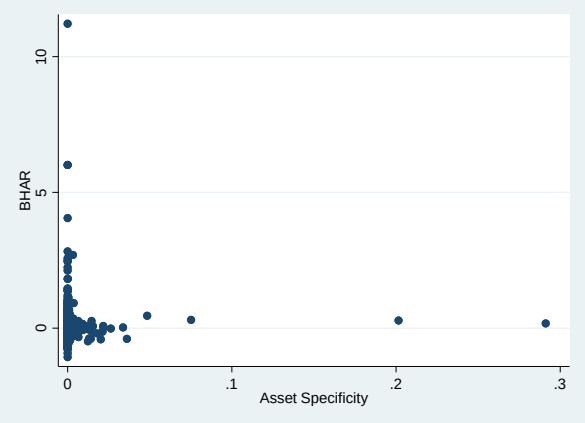


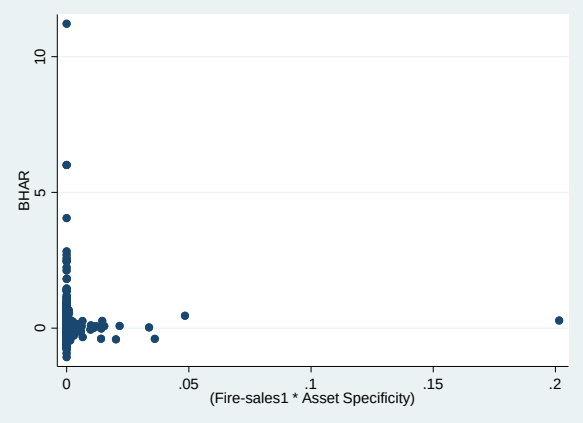


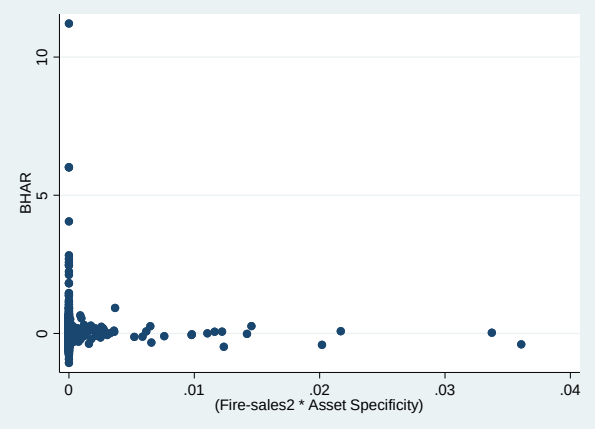


Assumption 2 long-term

As seen in the scatterplots below there is approximately a linear relationship between the dependent and independent variables. Why this assumption is fulfilled.







Assumption 3 short-term

Distress measure 1

As seen in the jaque-bera test below, the null hypothesis is rejected. This means that the error term is not normally distributed. This assumption is therefore violated. A way to overcome the non-normality of the residuals is by making log-transformations. However, it did not help on the normality assumption nor changed the conclusions why the results listed in the paper will be the original ones.

```
. sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                              ------- joint -------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------------
   residuals |      2,230      0.0000        0.0000          .              .

.
end of do-file
```

As seen in the Breusch-Pagan test below the null hypothesis is rejected. This means that there is heteroscedasticity. The assumptions of homogeneus variance is therefore not fulfilled. Heteroscedacity does not bias the coefficients but tend to make them less precise. This means that they are further away from the correct population value. Furthermore, heteroscedacity is associated with lower p-values. This potentially bias the results.

```
. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of car

         chi2(1)      = 44001.95
         Prob > chi2  =   0.0000

.
end of do-file
```

Distress measure 2

As seen in the jaque-bera test below, the null hypothesis is rejected. This means that the error term is not normally distributed. This assumption is therefore violated. A way to overcome the non-normality of the residuals is by making log-transformations. However, it did not help on the normality assumption nor changed the conclusions why the results listed in the paper will be the original ones.

```
. sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                              ------ joint ------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------------
   residuals |      2,290      0.0000        0.0000          .              .

.
end of do-file
```

As seen in the Breusch-Pagan test below the null hypothesis is rejected. This means that there is heteroscedasticity. The assumptions of homogeneus variance is therefore not fulfilled. Heteroscedacity does not bias the coefficients but tend to make them less precise. This means that they are further away from the correct population value. Furthermore, heteroscedacity is associated with lower p-values. This potentially bias the results.

```
. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of car

         chi2(1)      = 32168.64
         Prob > chi2  =   0.0000

.
end of do-file
```

Assumption 3 long-term

Distress measure 1

As seen in the jaque-bera test below, the null hypothesis is rejected. This means that the error term is not normally distributed. This assumption is therefore violated. A way to overcome the non-normality of the residuals is by making log-transformations. However, it did not help on the normality assumption nor changed the conclusions why the results listed in the paper will be the original ones.

```
. sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                              ------- joint -------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------------
   residuals |      2,138      0.0000        0.0000          .              .

.
end of do-file
```

As seen in the Breusch-Pagan test below the null hypothesis is rejected. This means that there is heteroscedasticity. The assumptions of homogeneus variance is therefore not fulfilled. Heteroscedacity does not bias the coefficients but tend to make them less precise. This means that they are further away from the correct population value. Furthermore, heteroscedacity is associated with lower p-values. This potentially bias the results.

```
. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of bhar

         chi2(1)      =   989.68
         Prob > chi2  =   0.0000

.
end of do-file
```

Distress measure 2

As seen in the jaque-bera test below, the null hypothesis is rejected. This means that the error term is not normally distributed. This assumption is therefore violated. A way to overcome the non-normality of the residuals is by making log-transformations. However, it did not help on the normality assumption nor changed the conclusions why the results listed in the paper will be the original ones.

```
. sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                              ------- joint -------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------------
   residuals |      2,198      0.0000        0.0000          .              .

.
end of do-file
```

As seen in the Breusch-Pagan test below the null hypothesis is rejected. This means that there is heteroscedasticity. The assumptions of homogeneus variance is therefore not fulfilled. Heteroscedacity does not bias the coefficients but tend to make them less precise. This means that they are further away from the correct population value. Furthermore, heteroscedacity is associated with lower p-values. This potentially bias the results.

```
. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of bhar

         chi2(1)      =  2424.69
         Prob > chi2  =   0.0000

.
end of do-file
```

Assumption 4 short-term

Distress measure 1

The fourth assumption states that the error terms are independent of each other. The null hypothesis, which states that there is no first lag autocorrelation, is rejected. This means that this assumption is not fulfilled. This bias the standard errors and makes the results less efficient. It does not affect the coefficients. When auto correlation is present the t-statistics tends to be higher, because of underestimated standard errors.

```
.            estat dwatson

Number of gaps in sample:  2221

Durbin-Watson d-statistic(427,  2230) =  .0029643

.
end of do-file
```

Distress measure 2

The fourth assumption states that the error terms are independent of each other. The null hypothesis, which states that there is no first lag autocorrelation, is rejected. This means that this assumption is not fulfilled. This bias the standard errors and makes the results less efficient. It does not affect the coefficients. When auto correlation is present the t-statistics tends to be higher, because of underestimated standard errors.

```
.            estat dwatson

Number of gaps in sample:  2281

Durbin-Watson d-statistic(431,  2290) =  .0023392

.
end of do-file
```

Assumption 4 long-term

Distress measure 1

The fourth assumption states that the error terms are independent of each other. The null hypothesis, which states that there is no first lag autocorrelation, is rejected. This means that this assumption is not fulfilled. This bias the standard errors and makes the results less efficient. It does not affect the coefficients. When auto correlation is present the t-statistics tends to be higher, because of underestimated standard errors.

```
.            estat dwatson

Number of gaps in sample:  2131

Durbin-Watson d-statistic(420,  2138) =  .0193844

.
end of do-file
```

Distress measure 2

The fourth assumption states that the error terms are independent of each other. The null hypothesis, which states that there is no first lag autocorrelation, is rejected. This means that this assumption is not fulfilled. This bias the standard errors and makes the results less efficient. It does not affect the coefficients. When auto correlation is present the t-statistics tends to be higher, because of underestimated standard errors.

```
.            estat dwatson

Number of gaps in sample:  2191

Durbin-Watson d-statistic(424,  2198) =  .0145733

.
end of do-file
```

Assumption 5 Short-term

Distress measure 1

As seen in appendix 2 sheet 2 – VIF it is only the independent variables to control for fixed-effect which have a too high VIF. The fixed-effects have been removed but it did not change the conclusions why the original regression output have been maintained.

Distress measure 2

As seen in appendix 2 sheet 2 – VIF it is only the independent variables to control for fixed-effect which have a too high VIF. The fixed-effects have been removed but it did not change the conclusions why the original regression output have been maintained.

Assumption 5 Long-term

Distress measure 1

As seen in appendix 2 sheet 2 – VIF it is only the independent variables to control for fixed-effect which have a too high VIF. The fixed-effects have been removed but it did not change the conclusions why the original regression output have been maintained.

Distress measure 2

As seen in appendix 2 sheet 2 – VIF it is only the independent variables to control for fixed-effect which have a too high VIF. The fixed-effects have been removed but it did not change the conclusions why the original regression output have been maintained.

Appendix 21 – Assumptions seventh hypothesis

Assumption 1

As described in section 4.6.1 this hypothesis is automatically satisfied.

Assumption 2

As described in section 4.6.1 this assumption is automatically satisfied since the independent variables besides control variables is dummy variables.

Assumption 3 short-term

Distress measure 1

As seen in the jaque-bera test below, the null hypothesis is rejected. This means that the error term is not normally distributed. This assumption is therefore violated. A way to overcome the non-normality of the

residuals is by making log-transformations. However, it did not help on the normality assumption nor changed the conclusions why the results listed in the paper will be the original ones.

```
. sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                              ------- joint -------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------------
   residuals |        794      0.0000        0.0000           .          0.0000

.
end of do-file
```

As seen in the Breusch-Pagan test below the null hypothesis is rejected. This means that there is heteroscedasticity. The assumptions of homogeneus variance is therefore not fulfilled. Heteroscedacity does not bias the coefficients but tend to make them less precise. This means that they are further away from the correct population value. Furthermore, heteroscedacity is associated with lower p-values. This potentially bias the results.

```
. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of car

         chi2(1)      =    20.91
         Prob > chi2  =   0.0000

.
end of do-file
```

Distress measure 2

As seen in the jaque-bera test below, the null hypothesis is rejected. This means that the error term is not normally distributed. This assumption is therefore violated. A way to overcome the non-normality of the residuals is by making log-transformations. However, it did not help on the normality assumption nor changed the conclusions why the results listed in the paper will be the original ones.

```
. sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                              ------- joint -------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------------
   residuals |        768      0.0035        0.0000           .          0.0000

.
end of do-file
```

As seen in the Breusch-Pagan test below the null hypothesis is rejected. This means that there is heteroscedasticity. The assumptions of homogeneus variance is therefore not fulfilled. Heteroscedacity does not bias the coefficients but tend to make them less precise. This means that they are further away from the correct population value. Furthermore, heteroscedacity is associated with lower p-values. This potentially bias the results.

```
. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of car

         chi2(1)      =     0.12
         Prob > chi2  =   0.7282

.
end of do-file
```

Assumption 3 long-term

Distress measure 1

As seen in the jaque-bera test below, the null hypothesis is rejected. This means that the error term is not normally distributed. This assumption is therefore violated. A way to overcome the non-normality of the residuals is by making log-transformations. However, it did not help on the normality assumption nor changed the conclusions why the results listed in the paper will be the original ones.

```
. sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                              ------- joint -------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------------
   residuals |        768      0.0000        0.0000           .          0.0000

.
end of do-file
```

As seen in the Breusch-Pagan test below the null hypothesis is rejected. This means that there is heteroscedasticity. The assumptions of homogeneus variance is therefore not fulfilled. Heteroscedacity does not bias the coefficients but tend to make them less precise. This means that they are further away from the correct population value. Furthermore, heteroscedacity is associated with lower p-values. This potentially bias the results.

```
. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of bhar

         chi2(1)      =  1419.02
         Prob > chi2  =   0.0000

.
end of do-file
```

Distress measure 2

As seen in the jaque-bera test below, the null hypothesis is rejected. This means that the error term is not normally distributed. This assumption is therefore violated. A way to overcome the non-normality of the residuals is by making log-transformations. However, it did not help on the normality assumption nor changed the conclusions why the results listed in the paper will be the original ones.

```
. sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                              ------ joint ------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------------
   residuals |        730      0.0000        0.0000           .          0.0000

.
end of do-file
```

As seen in the Breusch-Pagan test below the null hypothesis is rejected. This means that there is heteroscedasticity. The assumptions of homogeneus variance is therefore not fulfilled. Heteroscedacity does not bias the coefficients but tend to make them less precise. This means that they are further away from the correct population value. Furthermore, heteroscedacity is associated with lower p-values. This potentially bias the results.

```
. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of bhar

         chi2(1)      =  4819.31
         Prob > chi2  =   0.0000

.
end of do-file
```

Assumption 4 short-term

Distress measure 1

The fourth assumption states that the error terms are independent of each other. The null hypothesis, which states that there is no first lag autocorrelation, is rejected. This means that this assumption is not fulfilled. This bias the standard errors and makes the results less efficient. It does not affect the coefficients. When auto correlation is present the t-statistics tends to be higher, because of underestimated standard errors.

```
.            estat dwatson

Number of gaps in sample:  793

Durbin-Watson d-statistic(323,    794) =          0

.
end of do-file
```

Distress measure 2

The fourth assumption states that the error terms are independent of each other. The null hypothesis, which states that there is no first lag autocorrelation, is rejected. This means that this assumption is not fulfilled. This bias the standard errors and makes the results less efficient. It does not affect the coefficients. When auto correlation is present the t-statistics tends to be higher, because of underestimated standard errors.

```
.            estat dwatson

Number of gaps in sample:  767

Durbin-Watson d-statistic(325,    768) =          0

.
end of do-file
```

Assumption 4 long-term

Distress measure 1

The fourth assumption states that the error terms are independent of each other. The null hypothesis, which states that there is no first lag autocorrelation, is rejected. This means that this assumption is not fulfilled. This bias the standard errors and makes the results less efficient. It does not affect the coefficients. When auto correlation is present the t-statistics tends to be higher, because of underestimated standard errors.

```
.            estat dwatson

Number of gaps in sample:  767

Durbin-Watson d-statistic(315,   768) =         0

.
end of do-file
```

Distress measure 2

The fourth assumption states that the error terms are independent of each other. The null hypothesis, which states that there is no first lag autocorrelation, is rejected. This means that this assumption is not fulfilled. This bias the standard errors and makes the results less efficient. It does not affect the coefficients. When auto correlation is present the t-statistics tends to be higher, because of underestimated standard errors.

```
.            estat dwatson

Number of gaps in sample:  729

Durbin-Watson d-statistic(317,   730) =         0

.
end of do-file
```

Assumption 5 Short-term

Distress measure 1

As seen in appendix 2 sheet 2 – VIF it is only the independent variables to control for fixed-effect which have a too high VIF. The fixed-effects have been removed but it did not change the conclusions why the original regression output have been maintained.

Distress measure 2

As seen in appendix 2 sheet 2 – VIF it is only the independent variables to control for fixed-effect which have a too high VIF. The fixed-effects have been removed but it did not change the conclusions why the original regression output have been maintained.

Assumption 5 Long-term

Distress measure 1

As seen in appendix 2 sheet 2 – VIF it is only the independent variables to control for fixed-effect which have a too high VIF. The fixed-effects have been removed but it did not change the conclusions why the original regression output have been maintained.

Distress measure 2

As seen in appendix 2 sheet 2 – VIF it is only the independent variables to control for fixed-effect which have a too high VIF. The fixed-effects have been removed but it did not change the conclusions why the original regression output have been maintained.

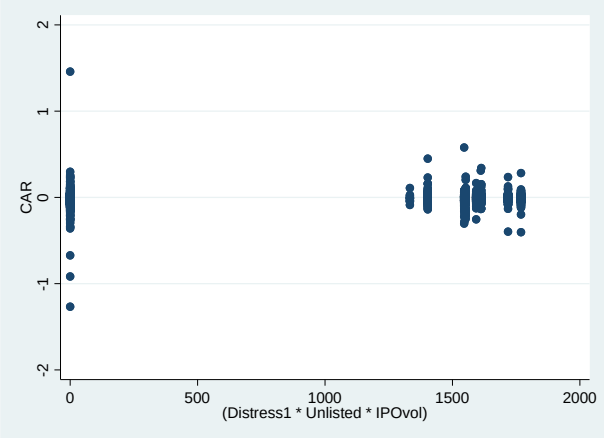
Appendix 22 – Assumptions eighth hypothesis

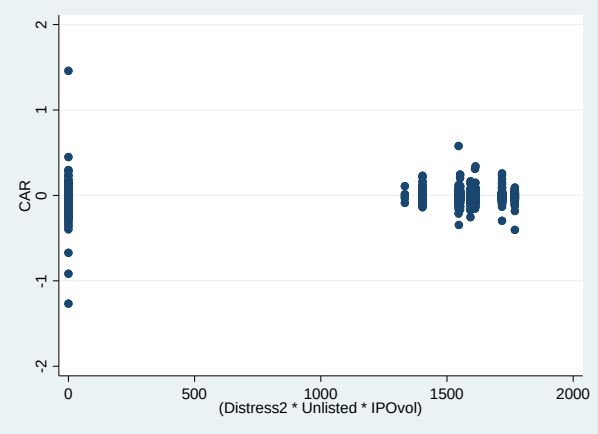
Assumption 1

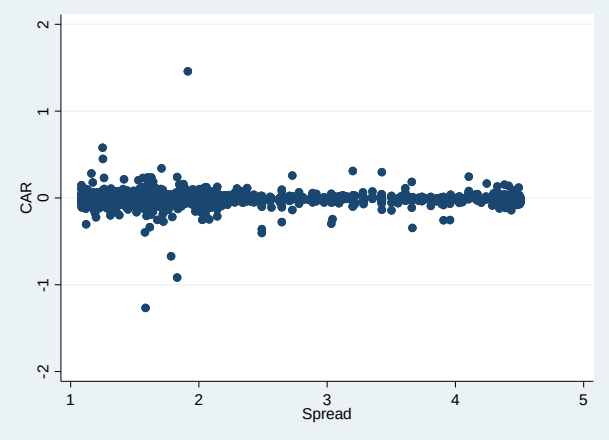
As described in section 4.6.1 this hypothesis is automatically satisfied.

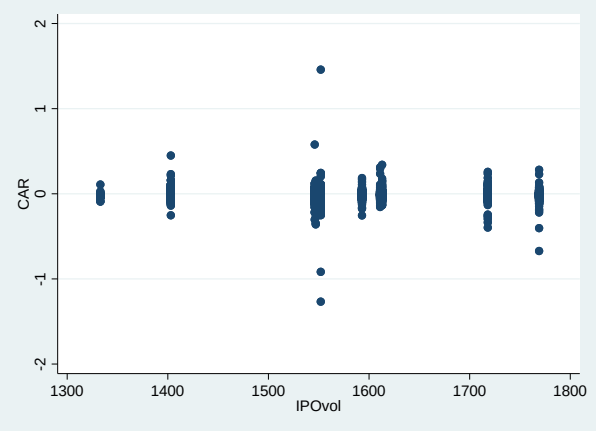
Assumption 2 short-term

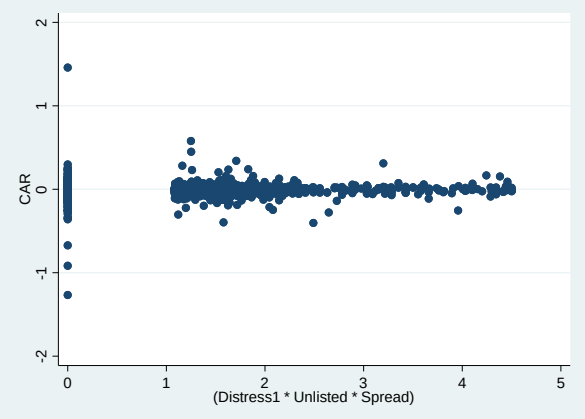
As seen in the scatterplots below there is a linear relationship between the dependent and independent variables. Why this assumption is fulfilled.

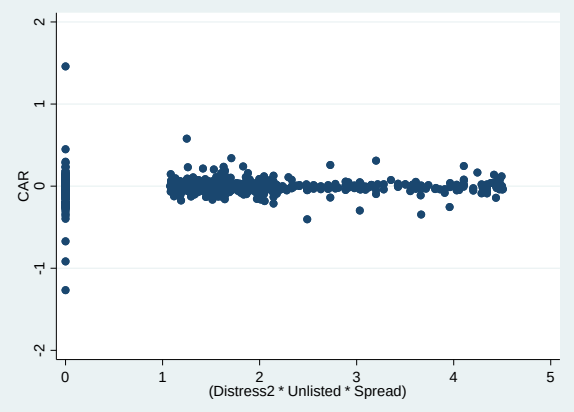












Assumption 2 - Long-term

As seen in the scatterplots below there is approximately a linear relationship between the dependent and independent variables. Why this assumption is fulfilled.

Assumption 3 short-term

Distress measure 1

As seen in the jaque-bera test below, the null hypothesis is rejected. This means that the error term is not normally distributed. This assumption is therefore violated. A way to overcome the non-normality of the residuals is by making log-transformations. However, it did not help on the normality assumption nor changed the conclusions why the results listed in the paper will be the original ones.

```
.                                   sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                              ------- joint -------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------------
   residuals |      2,213      0.0000        0.0000           .              .

.
end of do-file
```

As seen in the Breusch-Pagan test below the null hypothesis is rejected. This means that there is heteroscedasticity. The assumptions of homogeneus variance is therefore not fulfilled. Heteroscedacity does not bias the coefficients but tend to make them less precise. This means that they are further away from the correct population value. Furthermore, heteroscedacity is associated with lower p-values. This potentially bias the results.

```
.         hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of car

         chi2(1)      = 45080.30
         Prob > chi2  =   0.0000

.
end of do-file
```

Distress measure 2

As seen in the jaque-bera test below, the null hypothesis is rejected. This means that the error term is not normally distributed. This assumption is therefore violated. A way to overcome the non-normality of the residuals is by making log-transformations. However, it did not help on the normality assumption nor changed the conclusions why the results listed in the paper will be the original ones.

```
. sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                              ------ joint ------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------------
   residuals |      2,273      0.0000        0.0000           .              .

.
end of do-file
```

As seen in the Breusch-Pagan test below the null hypothesis is rejected. This means that there is heteroscedasticity. The assumptions of homogeneus variance is therefore not fulfilled. Heteroscedacity does not bias the coefficients but tend to make them less precise. This means that they are further away from the correct population value. Furthermore, heteroscedacity is associated with lower p-values. This potentially bias the results.

```
. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of car

         chi2(1)      = 33025.11
         Prob > chi2  =   0.0000

.
end of do-file
```

Assumption 3 long-term

Distress measure 1

As seen in the jaque-bera test below, the null hypothesis is rejected. This means that the error term is not normally distributed. This assumption is therefore violated. A way to overcome the non-normality of the residuals is by making log-transformations. However, it did not help on the normality assumption nor changed the conclusions why the results listed in the paper will be the original ones.

```
. sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                              ------- joint -------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------------
   residuals |      2,133      0.0000        0.0000           .              .

.
end of do-file
```

As seen in the Breusch-Pagan test below the null hypothesis is rejected. This means that there is heteroscedasticity. The assumptions of homogeneus variance is therefore not fulfilled. Heteroscedacity does not bias the coefficients but tend to make them less precise. This means that they are further away from the correct population value. Furthermore, heteroscedacity is associated with lower p-values. This potentially bias the results.

```
. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of bhar

         chi2(1)      =   946.56
         Prob > chi2  =   0.0000

.
end of do-file
```

Distress measure 2

As seen in the jaque-bera test below, the null hypothesis is rejected. This means that the error term is not normally distributed. This assumption is therefore violated. A way to overcome the non-normality of the

residuals is by making log-transformations. However, it did not help on the normality assumption nor changed the conclusions why the results listed in the paper will be the original ones.

```
. sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                              ------- joint -------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------------
   residuals |      2,193     0.0000        0.0000           .              .

.
end of do-file
```

As seen in the Breusch-Pagan test below the null hypothesis is rejected. This means that there is heteroscedasticity. The assumptions of homogeneus variance is therefore not fulfilled. Heteroscedacity does not bias the coefficients but tend to make them less precise. This means that they are further away from the correct population value. Furthermore, heteroscedacity is associated with lower p-values. This potentially bias the results.

```
. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of bhar

         chi2(1)      =  2458.12
         Prob > chi2  =   0.0000

.
end of do-file
```

Assumption 4 short-term

Distress measure 1

The fourth assumption states that the error terms are independent of each other. The null hypothesis, which states that there is no first lag autocorrelation, is rejected. This means that this assumption is not fulfilled. This bias the standard errors and makes the results less efficient. It does not affect the

coefficients. When auto correlation is present the t-statistics tends to be higher, because of underestimated standard errors.

```
.            estat dwatson

Number of gaps in sample:  2204

Durbin-Watson d-statistic(428,  2213) =  .0034739

.
end of do-file
```

Distress measure 2

The fourth assumption states that the error terms are independent of each other. The null hypothesis, which states that there is no first lag autocorrelation, is rejected. This means that this assumption is not fulfilled. This bias the standard errors and makes the results less efficient. It does not affect the coefficients. When auto correlation is present the t-statistics tends to be higher, because of underestimated standard errors.

```
.            estat dwatson

Number of gaps in sample:  2264

Durbin-Watson d-statistic(431,  2273) =  .0027043

.
end of do-file
```

Assumption 4 long-term

Distress measure 1

The fourth assumption states that the error terms are independent of each other. The null hypothesis, which states that there is no first lag autocorrelation, is rejected. This means that this assumption is not fulfilled. This bias the standard errors and makes the results less efficient. It does not affect the

coefficients. When auto correlation is present the t-statistics tends to be higher, because of underestimated standard errors.

```
.            estat dwatson

Number of gaps in sample:  2126

Durbin-Watson d-statistic(421,  2133) =   .018929

.
end of do-file
```

Distress measure 2

The fourth assumption states that the error terms are independent of each other. The null hypothesis, which states that there is no first lag autocorrelation, is rejected. This means that this assumption is not fulfilled. This bias the standard errors and makes the results less efficient. It does not affect the coefficients. When auto correlation is present the t-statistics tends to be higher, because of underestimated standard errors.

```
.            estat dwatson

Number of gaps in sample:  2186

Durbin-Watson d-statistic(424,  2193) =  .0143746

.
end of do-file
```

Assumption 5 Short-term

Distress measure 1

As seen in appendix 2 sheet 2 – VIF it is only the independent variables to control for fixed-effect which have a too high VIF. The fixed-effects have been removed but it did not change the conclusions why the original regression output have been maintained.

Distress measure 2

As seen in appendix 2 sheet 2 – VIF it is only the independent variables to control for fixed-effect which have a too high VIF. The fixed-effects have been removed but it did not change the conclusions why the original regression output have been maintained.

Assumption 5 Long-term

Distress measure 1

As seen in appendix 2 sheet 2 – VIF it is only the independent variables to control for fixed-effect which have a too high VIF. The fixed-effects have been removed but it did not change the conclusions why the original regression output have been maintained.

Distress measure 2

As seen in appendix 2 sheet 2 – VIF it is only the independent variables to control for fixed-effect which have a too high VIF. The fixed-effects have been removed but it did not change the conclusions why the original regression output have been maintained.

Appendix 23 – Assumptions ninth hypothesis

Assumption 1

As described in section 4.6.1 this hypothesis is automatically satisfied.

Assumption 2

As described in section 4.6.1 this assumption is automatically satisfied since the independent variables besides control variables is dummy variables.

Assumption 3 short-term

Distress measure 1

As seen in the jaque-bera test below, the null hypothesis is rejected. This means that the error term is not normally distributed. This assumption is therefore violated. A way to overcome the non-normality of the residuals is by making log-transformations. However, it did not help on the normality assumption nor changed the conclusions why the results listed in the paper will be the original ones.

```
. sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                              ------- joint -------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------------
   residuals |      2,230      0.0000        0.0000           .             .

.
end of do-file
```

As seen in the Breusch-Pagan test below the null hypothesis is rejected. This means that there is heteroscedasticity. The assumptions of homogeneus variance is therefore not fulfilled. Heteroscedacity does not bias the coefficients but tend to make them less precise. This means that they are further away from the correct population value. Furthermore, heteroscedacity is associated with lower p-values. This potentially bias the results.

```
. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of car

         chi2(1)      = 43777.90
         Prob > chi2  =   0.0000

.
end of do-file
```

Distress measure 2

As seen in the jaque-bera test below, the null hypothesis is rejected. This means that the error term is not normally distributed. This assumption is therefore violated. A way to overcome the non-normality of the residuals is by making log-transformations. However, it did not help on the normality assumption nor changed the conclusions why the results listed in the paper will be the original ones.

```
. sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                              ------- joint -------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------------
   residuals |      2,290      0.0000        0.0000           .              .

.
end of do-file
```

As seen in the Breusch-Pagan test below the null hypothesis is rejected. This means that there is heteroscedasticity. The assumptions of homogeneus variance is therefore not fulfilled. Heteroscedacity does not bias the coefficients but tend to make them less precise. This means that they are further away from the correct population value. Furthermore, heteroscedacity is associated with lower p-values. This potentially bias the results.

```
. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of car

         chi2(1)      = 32557.08
         Prob > chi2  =   0.0000

.
end of do-file
```

Assumption 3 long-term

Distress measure 1

As seen in the jaque-bera test below, the null hypothesis is rejected. This means that the error term is not normally distributed. This assumption is therefore violated. A way to overcome the non-normality of the residuals is by making log-transformations. However, it did not help on the normality assumption nor changed the conclusions why the results listed in the paper will be the original ones.

```
. sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                              ------- joint -------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------------
   residuals |      2,138      0.0000        0.0000           .             .

.
end of do-file
```

As seen in the Breusch-Pagan test below the null hypothesis is rejected. This means that there is heteroscedasticity. The assumptions of homogeneus variance is therefore not fulfilled. Heteroscedacity does not bias the coefficients but tend to make them less precise. This means that they are further away from the correct population value. Furthermore, heteroscedacity is associated with lower p-values. This potentially bias the results.

```
. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of bhar

         chi2(1)      =   940.20
         Prob > chi2  =   0.0000

.
end of do-file
```

Distress measure 2

As seen in the jaque-bera test below, the null hypothesis is rejected. This means that the error term is not normally distributed. This assumption is therefore violated. A way to overcome the non-normality of the residuals is by making log-transformations. However, it did not help on the normality assumption nor changed the conclusions why the results listed in the paper will be the original ones.

```
. sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                              ------- joint -------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------------
   residuals |      2,198      0.0000        0.0000          .              .

.
end of do-file
```

As seen in the Breusch-Pagan test below the null hypothesis is rejected. This means that there is heteroscedasticity. The assumptions of homogeneus variance is therefore not fulfilled. Heteroscedacity does not bias the coefficients but tend to make them less precise. This means that they are further away from the correct population value. Furthermore, heteroscedacity is associated with lower p-values. This potentially bias the results.

```
. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of bhar

         chi2(1)      =  2329.28
         Prob > chi2  =   0.0000

.
end of do-file
```

Assumption 4 short-term

Distress measure 1

The fourth assumption states that the error terms are independent of each other. The null hypothesis, which states that there is no first lag autocorrelation, is rejected. This means that this assumption is not fulfilled. This bias the standard errors and makes the results less efficient. It does not affect the coefficients. When auto correlation is present the t-statistics tends to be higher, because of underestimated standard errors.

```
.            estat dwatson

Number of gaps in sample:  2221

Durbin-Watson d-statistic(426,  2230) =  .0030571

.
end of do-file
```

Distress measure 2

The fourth assumption states that the error terms are independent of each other. The null hypothesis, which states that there is no first lag autocorrelation, is rejected. This means that this assumption is not fulfilled. This bias the standard errors and makes the results less efficient. It does not affect the coefficients. When auto correlation is present the t-statistics tends to be higher, because of underestimated standard errors.

```
.            estat dwatson

Number of gaps in sample:  2281

Durbin-Watson d-statistic(429,  2290) =  .0025449

.
end of do-file
```

Assumption 4 long-term

Distress measure 1

The fourth assumption states that the error terms are independent of each other. The null hypothesis, which states that there is no first lag autocorrelation, is rejected. This means that this assumption is not fulfilled. This bias the standard errors and makes the results less efficient. It does not affect the coefficients. When auto correlation is present the t-statistics tends to be higher, because of underestimated standard errors.

```
.             estat dwatson

Number of gaps in sample:  2131

Durbin-Watson d-statistic(419,  2138) =  .0195371

.
end of do-file
```

Distress measure 2

The fourth assumption states that the error terms are independent of each other. The null hypothesis, which states that there is no first lag autocorrelation, is rejected. This means that this assumption is not fulfilled. This bias the standard errors and makes the results less efficient. It does not affect the coefficients. When auto correlation is present the t-statistics tends to be higher, because of underestimated standard errors.

```
.             estat dwatson

Number of gaps in sample:  2191

Durbin-Watson d-statistic(422,  2198) =  .0144589

.
end of do-file
```

Assumption 5 Short-term

Distress measure 1

As seen in appendix 2 sheet 2 – VIF it is only the independent variables to control for fixed-effect which have a too high VIF. The fixed-effects have been removed but it did not change the conclusions why the original regression output have been maintained.

Distress measure 2

As seen in appendix 2 sheet 2 – VIF it is only the independent variables to control for fixed-effect which have a too high VIF. The fixed-effects have been removed but it did not change the conclusions why the original regression output have been maintained.

Assumption 5 Long-term

Distress measure 1

As seen in appendix 2 sheet 2 – VIF it is only the independent variables to control for fixed-effect which have a too high VIF. The fixed-effects have been removed but it did not change the conclusions why the original regression output have been maintained.

Distress measure 2

As seen in appendix 2 sheet 2 – VIF it is only the independent variables to control for fixed-effect which have a too high VIF. The fixed-effects have been removed but it did not change the conclusions why the original regression output have been maintained.

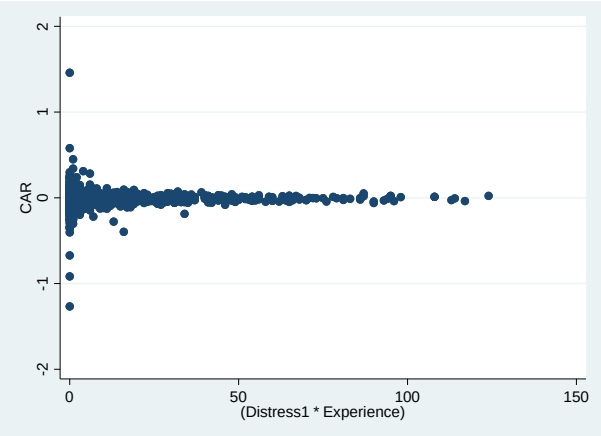
Appendix 24 – Assumptions tenth hypothesis

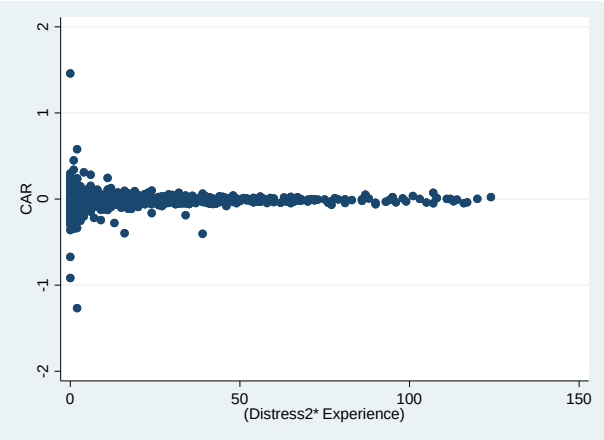
Assumption 1

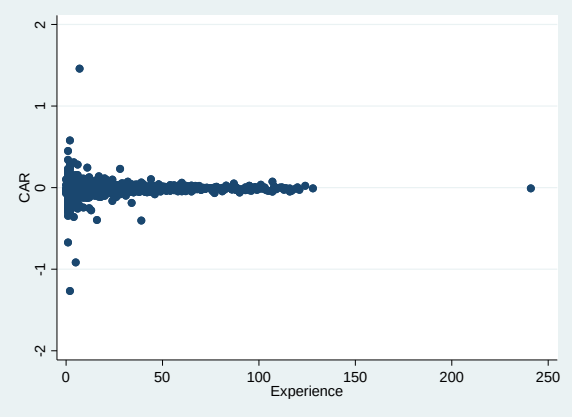
As described in section 4.6.1 this hypothesis is automatically satisfied.

Assumption 2 short-term

As seen in the scatterplots below there is a linear relationship between the dependent and independent variables. Why this assumption is fulfilled.

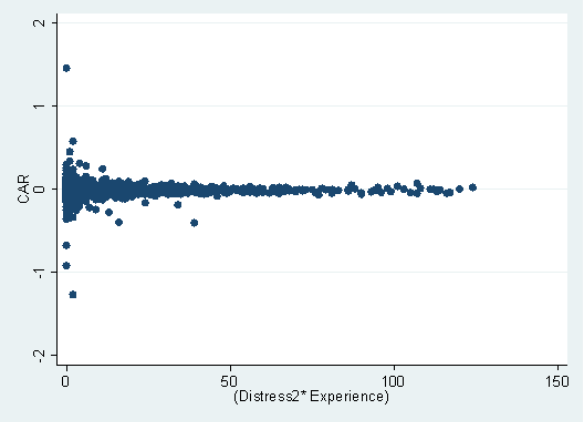


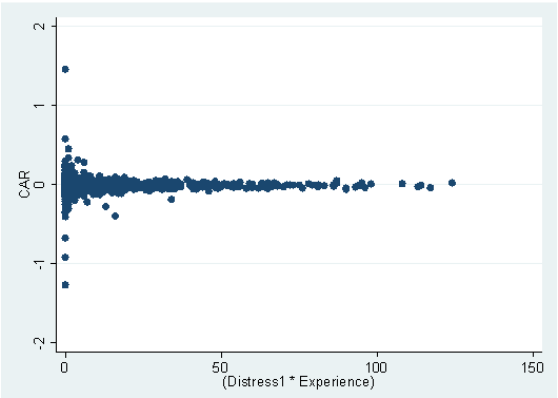


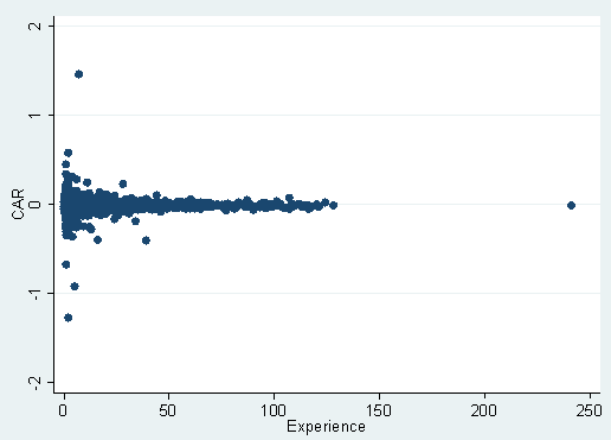


Assumption 2 Long-term

As seen in the scatterplots below there is a linear relationship between the dependent and independent variables. Why this assumption is fulfilled.







Assumption 3 short-term

Distress measure 1

As seen in the jaque-bera test below, the null hypothesis is rejected. This means that the error term is not normally distributed. This assumption is therefore violated. A way to overcome the non-normality of the residuals is by making log-transformations. However, it did not help on the normality assumption nor changed the conclusions why the results listed in the paper will be the original ones.

```
. sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                      ------- joint -------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------
   residuals |      2,230      0.0000        0.0000           .             .

.
end of do-file
```

As seen in the Breusch-Pagan test below the null hypothesis is rejected. This means that there is heteroscedasticity. The assumptions of homogeneus variance is therefore not fulfilled. Heteroscedacity does not bias the coefficients but tend to make them less precise. This means that they are further away from the correct population value. Furthermore, heteroscedacity is associated with lower p-values. This potentially bias the results.

```
.          hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of car

         chi2(1)      = 44756.56
         Prob > chi2  =   0.0000

.
end of do-file
```

Distress measure 2

As seen in the jaque-bera test below, the null hypothesis is rejected. This means that the error term is not normally distributed. This assumption is therefore violated. A way to overcome the non-normality of the residuals is by making log-transformations. However, it did not help on the normality assumption nor changed the conclusions why the results listed in the paper will be the original ones.

```
.                          sktest residuals

                 Skewness/Kurtosis tests for Normality
                                                      ------ joint ------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+---------------------------------------------------------------
   residuals |      2,290      0.0000        0.0000          .              .

.
end of do-file
```

As seen in the Breusch-Pagan test below the null hypothesis is rejected. This means that there is heteroscedasticity. The assumptions of homogeneus variance is therefore not fulfilled. Heteroscedacity does not bias the coefficients but tend to make them less precise. This means that they are further away from the correct population value. Furthermore, heteroscedacity is associated with lower p-values. This potentially bias the results.

```
.         hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of car

         chi2(1)      = 44756.56
         Prob > chi2  =   0.0000

.
end of do-file
```

Assumption 3 long-term

Distress measure 1

As seen in the jaque-bera test below, the null hypothesis is rejected. This means that the error term is not normally distributed. This assumption is therefore violated. A way to overcome the non-normality of the residuals is by making log-transformations. However, it did not help on the normality assumption nor changed the conclusions why the results listed in the paper will be the original ones.

```
.                                  sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                              ------- joint -------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+---------------------------------------------------------------------
   residuals |      2,138      0.0000        0.0000           .              .

.
end of do-file
```

As seen in the Breusch-Pagan test below the null hypothesis is rejected. This means that there is heteroscedasticity. The assumptions of homogeneus variance is therefore not fulfilled. Heteroscedacity does not bias the coefficients but tend to make them less precise. This means that they are further away from the correct population value. Furthermore, heteroscedacity is associated with lower p-values. This potentially bias the results.

```
.          hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of bhar

         chi2(1)      =    946.88
         Prob > chi2  =    0.0000

.
end of do-file
```

Distress measure 2

As seen in the jaque-bera test below, the null hypothesis is rejected. This means that the error term is not normally distributed. This assumption is therefore violated. A way to overcome the non-normality of the residuals is by making log-transformations. However, it did not help on the normality assumption nor changed the conclusions why the results listed in the paper will be the original ones.

```
.                              sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                              ------ joint ------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------------
   residuals |      2,198      0.0000        0.0000           .              .

.
end of do-file
```

As seen in the Breusch-Pagan test below the null hypothesis is rejected. This means that there is heteroscedasticity. The assumptions of homogeneus variance is therefore not fulfilled. Heteroscedacity does not bias the coefficients but tend to make them less precise. This means that they are further away from the correct population value. Furthermore, heteroscedacity is associated with lower p-values. This potentially bias the results.

```
.          hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of bhar

         chi2(1)      =  2345.89
         Prob > chi2  =   0.0000

.
end of do-file
```

Assumption 4 short-term

Distress measure 1

The fourth assumption states that the error terms are independent of each other. The null hypothesis, which states that there is no first lag autocorrelation, is rejected. This means that this assumption is not fulfilled. This bias the standard errors and makes the results less efficient. It does not affect the coefficients. When auto correlation is present the t-statistics tends to be higher, because of underestimated standard errors.

```
.            estat dwatson

Number of gaps in sample:  2221

Durbin-Watson d-statistic(426,  2230) =  .0033151

.
end of do-file
```

Distress measure 2

The fourth assumption states that the error terms are independent of each other. The null hypothesis, which states that there is no first lag autocorrelation, is rejected. This means that this assumption is not fulfilled. This bias the standard errors and makes the results less efficient. It does not affect the coefficients. When auto correlation is present the t-statistics tends to be higher, because of underestimated standard errors.

```
.            estat dwatson

Number of gaps in sample:  2281

Durbin-Watson d-statistic(429,  2290) =  .0025002

.
end of do-file
```

Assumption 4 long-term

Distress measure 1

The fourth assumption states that the error terms are independent of each other. The null hypothesis, which states that there is no first lag autocorrelation, is rejected. This means that this assumption is not fulfilled. This bias the standard errors and makes the results less efficient. It does not affect the coefficients. When auto correlation is present the t-statistics tends to be higher, because of underestimated standard errors.

```
.            estat dwatson

Number of gaps in sample:  2131

Durbin-Watson d-statistic(419,  2138) =   .019014

.
end of do-file
```

Distress measure 2

The fourth assumption states that the error terms are independent of each other. The null hypothesis, which states that there is no first lag autocorrelation, is rejected. This means that this assumption is not fulfilled. This bias the standard errors and makes the results less efficient. It does not affect the coefficients. When auto correlation is present the t-statistics tends to be higher, because of underestimated standard errors.

```
.            estat dwatson

Number of gaps in sample:  2191

Durbin-Watson d-statistic(422,  2198) =  .0141513

.
end of do-file
```

Assumption 5 Short-term

Distress measure 1

As seen in appendix 2 sheet 2 – VIF it is only the independent variables to control for fixed-effect which have a too high VIF. The fixed-effects have been removed but it did not change the conclusions why the original regression output have been maintained.

Distress measure 2

As seen in appendix 2 sheet 2 – VIF it is only the independent variables to control for fixed-effect which have a too high VIF. The fixed-effects have been removed but it did not change the conclusions why the original regression output have been maintained.

Assumption 5 Long-term

Distress measure 1

As seen in appendix 2 sheet 2 – VIF it is only the independent variables to control for fixed-effect which have a too high VIF. The fixed-effects have been removed but it did not change the conclusions why the original regression output have been maintained.

Distress measure 2

As seen in appendix 2 sheet 2 – VIF it is only the independent variables to control for fixed-effect which have a too high VIF. The fixed-effects have been removed but it did not change the conclusions why the original regression output have been maintained.

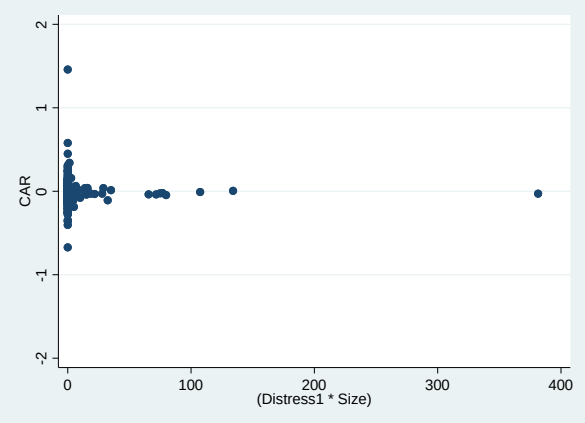
Appendix 25 – Assumptions eleventh hypothesis

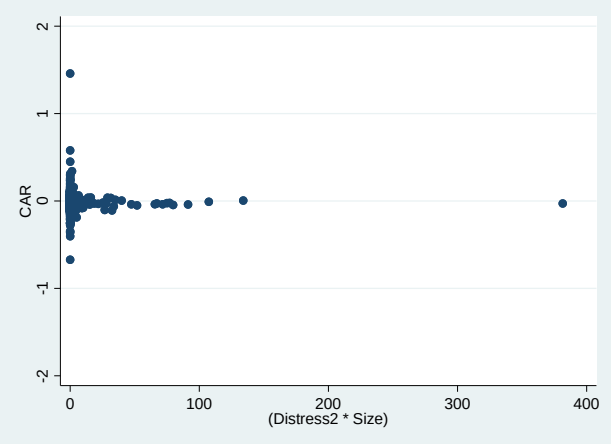
Assumption 1

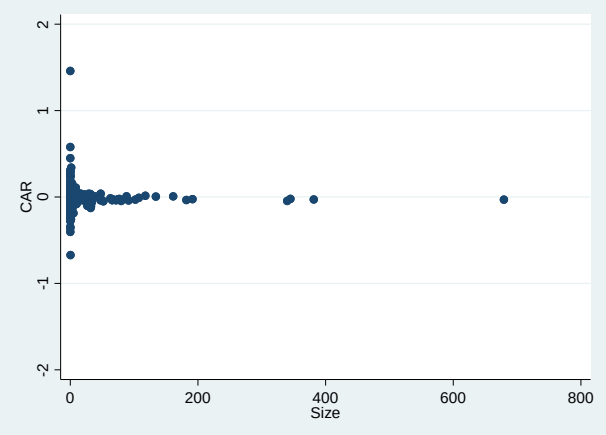
As described in section 4.6.1 this hypothesis is automatically satisfied.

Assumption 2 short-term

As seen in the scatterplots below there is a linear relationship between the dependent and independent variables. Why this assumption is fulfilled.

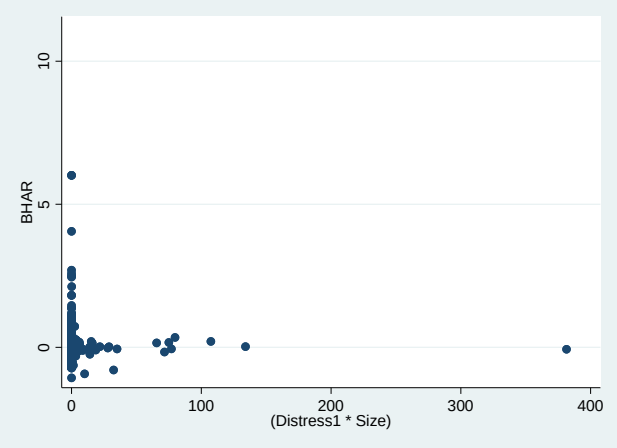


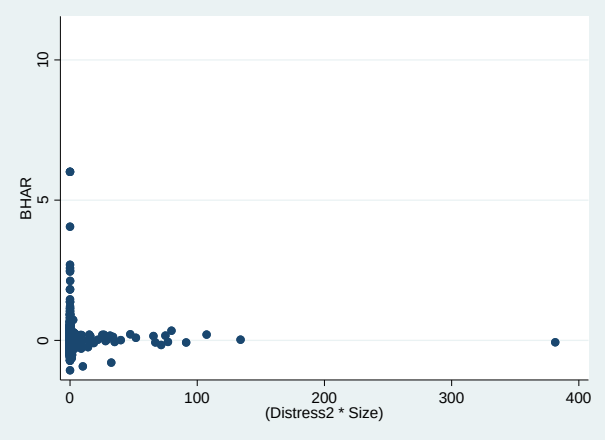


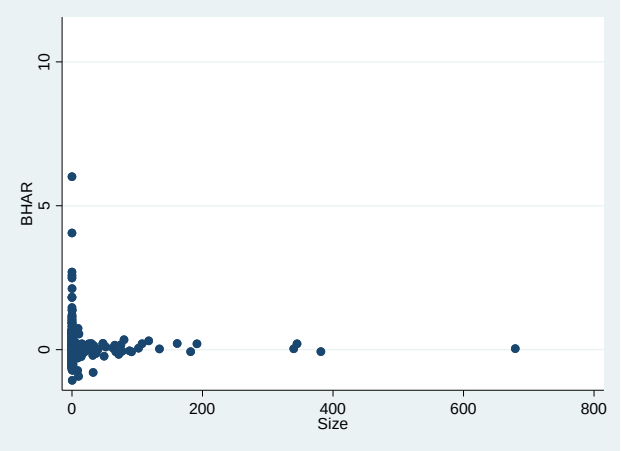


Assumption 2 long-term

As seen in the scatterplots below there is a linear relationship between the dependent and independent variables. Why this assumption is fulfilled.







Assumption 3 short-term

Distress measure 1

As seen in the jaque-bera test below, the null hypothesis is rejected. This means that the error term is not normally distributed. This assumption is therefore violated. A way to overcome the non-normality of the residuals is by making log-transformations. However, it did not help on the normality assumption nor changed the conclusions why the results listed in the paper will be the original ones.

```
. sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                              ------- joint -------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------------
   residuals |      1,879      0.0000        0.0000           .          0.0000

.
end of do-file
```

As seen in the Breusch-Pagan test below the null hypothesis is rejected. This means that there is heteroscedasticity. The assumptions of homogeneus variance is therefore not fulfilled. Heteroscedacity does not bias the coefficients but tend to make them less precise. This means that they are further away from the correct population value. Furthermore, heteroscedacity is associated with lower p-values. This potentially bias the results.

```
. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of car

         chi2(1)      = 52458.94
         Prob > chi2  =   0.0000

.
end of do-file
```

Distress measure 2

As seen in the jaque-bera test below, the null hypothesis is rejected. This means that the error term is not normally distributed. This assumption is therefore violated. A way to overcome the non-normality of the residuals is by making log-transformations. However, it did not help on the normality assumption nor changed the conclusions why the results listed in the paper will be the original ones.

```
. sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                                  ------- joint -------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------------
   residuals |      1,924      0.0005        0.0000           .          0.0000

.
end of do-file
```

As seen in the Breusch-Pagan test below the null hypothesis is rejected. This means that there is heteroscedasticity. The assumptions of homogeneus variance is therefore not fulfilled. Heteroscedacity does not bias the coefficients but tend to make them less precise. This means that they are further away from the correct population value. Furthermore, heteroscedacity is associated with lower p-values. This potentially bias the results.

```
. hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of car

         chi2(1)      = 40023.81
         Prob > chi2  =   0.0000

.
end of do-file
```

Assumption 3 long-term

Distress measure 1

As seen in the jaque-bera test below, the null hypothesis is rejected. This means that the error term is not normally distributed. This assumption is therefore violated. A way to overcome the non-normality of the residuals is by making log-transformations. However, it did not help on the normality assumption nor changed the conclusions why the results listed in the paper will be the original ones.

```
. sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                              ------ joint ------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------------
   residuals |      1,797      0.0000        0.0000          .              .

.
end of do-file
```

As seen in the Breusch-Pagan test below the null hypothesis is rejected. This means that there is heteroscedasticity. The assumptions of homogeneus variance is therefore not fulfilled. Heteroscedacity does not bias the coefficients but tend to make them less precise. This means that they are further away from the correct population value. Furthermore, heteroscedacity is associated with lower p-values. This potentially bias the results.

```
.          hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of bhar

         chi2(1)      =  1110.04
         Prob > chi2  =   0.0000

.
end of do-file
```

Distress measure 2

As seen in the jaque-bera test below, the null hypothesis is rejected. This means that the error term is not normally distributed. This assumption is therefore violated. A way to overcome the non-normality of the residuals is by making log-transformations. However, it did not help on the normality assumption nor changed the conclusions why the results listed in the paper will be the original ones.

```
. sktest residuals

                    Skewness/Kurtosis tests for Normality
                                                              ------- joint -------
    Variable |        Obs  Pr(Skewness)  Pr(Kurtosis) adj chi2(2)    Prob>chi2
-------------+-------------------------------------------------------------------
   residuals |      1,842     0.0000        0.0000          .              .

.
end of do-file
```

As seen in the Breusch-Pagan test below the null hypothesis is rejected. This means that there is heteroscedasticity. The assumptions of homogeneus variance is therefore not fulfilled. Heteroscedacity does not bias the coefficients but tend to make them less precise. This means that they are further away from the correct population value. Furthermore, heteroscedacity is associated with lower p-values. This potentially bias the results.

```
.         hettest

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of bhar

         chi2(1)      =  2426.73
         Prob > chi2  =   0.0000

.
end of do-file
```

Assumption 4 short-term

Distress measure 1

The fourth assumption states that the error terms are independent of each other. The null hypothesis, which states that there is no first lag autocorrelation, is rejected. This means that this assumption is not fulfilled. This bias the standard errors and makes the results less efficient. It does not affect the coefficients. When auto correlation is present the t-statistics tends to be higher, because of underestimated standard errors.

```
.            estat dwatson

Number of gaps in sample:  1871

Durbin-Watson d-statistic(416,  1879) =  .0018497

.
end of do-file
```

Distress measure 2

The fourth assumption states that the error terms are independent of each other. The null hypothesis, which states that there is no first lag autocorrelation, is rejected. This means that this assumption is not fulfilled. This bias the standard errors and makes the results less efficient. It does not affect the coefficients. When auto correlation is present the t-statistics tends to be higher, because of underestimated standard errors.

```
.            estat dwatson

Number of gaps in sample:  1916

Durbin-Watson d-statistic(419,  1924) =  .0014605

.
end of do-file
```

Assumption 4 long-term

Distress measure 1

The fourth assumption states that the error terms are independent of each other. The null hypothesis, which states that there is no first lag autocorrelation, is rejected. This means that this assumption is not fulfilled. This bias the standard errors and makes the results less efficient. It does not affect the coefficients. When auto correlation is present the t-statistics tends to be higher, because of underestimated standard errors.

```
.            estat dwatson

Number of gaps in sample:  1791

Durbin-Watson d-statistic(407,  1797) =  .0198392

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end of do-file
```

Distress measure 2

The fourth assumption states that the error terms are independent of each other. The null hypothesis, which states that there is no first lag autocorrelation, is rejected. This means that this assumption is not fulfilled. This bias the standard errors and makes the results less efficient. It does not affect the coefficients. When auto correlation is present the t-statistics tends to be higher, because of underestimated standard errors.

```
.            estat dwatson

Number of gaps in sample:  1836

Durbin-Watson d-statistic(410,  1842) =  .0142296

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end of do-file
```

Assumption 5 Short-term

Distress measure 1

As seen in appendix 2 sheet 2 – VIF it is only the independent variables to control for fixed-effect which have a too high VIF. The fixed-effects have been removed but it did not change the conclusions why the original regression output have been maintained.

Distress measure 2

As seen in appendix 2 sheet 2 – VIF it is only the independent variables to control for fixed-effect which have a too high VIF. The fixed-effects have been removed but it did not change the conclusions why the original regression output have been maintained.

Assumption 5 Long-term

Distress measure 1

As seen in appendix 2 sheet 2 – VIF it is only the independent variables to control for fixed-effect which have a too high VIF. The fixed-effects have been removed but it did not change the conclusions why the original regression output have been maintained.

Distress measure 2

As seen in appendix 2 sheet 2 – VIF it is only the independent variables to control for fixed-effect which have a too high VIF. The fixed-effects have been removed but it did not change the conclusions why the original regression output have been maintained.

Appendix 26 - Alternative tests

As seen in table 1 below there is a summary of all the results of the alternative tests. The full regression output can be seen later on in this appendix.

Hypothesis (H)	BHAR	
	(3)	(4)
H1: *Distressed targets are acquired at a higher discount.*	✗	✗
H2: *Distressed targets are acquired at a higher discount when their industry is distressed.*	✗	✗
H4: *Distressed targets in distressed industries are acquired by a higher discount when it is bought of an industry insider compared to an industry outsider.*	✗	✗
H5: *Distressed targets in a distressed industry with low implicit competition are acquired by a higher discount.*	✗	✗
H6: *Distressed targets in a distressed industry with high asset specificity are acquired by a higher discount.*	✗	✗
H7: *Distressed targets there is unlisted are acquired at a higher discount than distressed targets there are listed.*	✗	✗
H8: *Distressed unlisted targets sells at a higher discount when the conditions on the debt- and equity markets makes alternative sources of liquidity more difficult and costly to obtain.*	✗	✗
H9: *Distressed targets are acquired at a higher discount in distressed times.*	✗	✗
H10: *Distressed targets acquired by an experienced firm are associated with higher wealth transfer to the acquirer.*	✗	✗
H11: *Distressed targets acquired by a relatively larger firm are associated with higher wealth transfer to the acquirer.*	✗	✗

**Of ones own make. (Conclusions are based on a 95 percent confidence level)*

Alternative test first hypothesis

Distress measure 1

Source	SS	df	MS	Number of obs	=	1,629
				F(398, 1230)	=	2.55
Model	13743.5412	398	34.5315106	Prob > F	=	0.0000
Residual	16683.2541	1,230	13.5636212	R-squared	=	0.4517
				Adj R-squared	=	0.2743
Total	30426.7953	1,628	18.6896777	Root MSE	=	3.6829

alternativebhar	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
distress1	.3266461	.2741498	1.19	0.234	-.2112069	.8644991
acquirertangibili~l	-1.867938	.786036	-2.38	0.018	-3.410057	-.3258179
acquirerleveragec~l	.5308758	.7505191	0.71	0.479	-.9415635	2.003315
targettangibility~l	1.330061	.6364138	2.09	0.037	.0814841	2.578638
targetleveragecon~l	.1337859	.5659167	0.24	0.813	-.976483	1.244055
acquirertobinsq	.0789307	.1076566	0.73	0.464	-.1322801	.2901415
allstocks	-.0575755	.570557	-0.10	0.920	-1.176948	1.061797
allcash	-.8807886	.3833499	-2.30	0.022	-1.632881	-.1286965
initialstake	1.734328	1.31104	1.32	0.186	-.8377953	4.306451
acquirermarkettob~k	-.0021034	.0182944	-0.11	0.908	-.0379951	.0337883

Distress measure 2

Source	SS	df	MS	Number of obs	=	1,684
				F(402, 1281)	=	2.62
Model	13762.8412	402	34.2359234	Prob > F	=	0.0000
Residual	16762.516	1,281	13.0854926	R-squared	=	0.4509
				Adj R-squared	=	0.2785
Total	30525.3572	1,683	18.1374671	Root MSE	=	3.6174

alternativebhar	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
distress2	-.3908732	.2337462	-1.67	0.095	-.8494406	.0676942
acquirertangibilityc~l	-1.792764	.7546147	-2.38	0.018	-3.273181	-.3123477
acquirerleveragecont~l	.3683141	.7183235	0.51	0.608	-1.040906	1.777534
targettangibilitycon~l	1.216827	.6011045	2.02	0.043	.0375694	2.396084
targetleveragecontrol	.6937704	.4749543	1.46	0.144	-.2380033	1.625544
acquirertobinsq	.0705235	.1039623	0.68	0.498	-.1334316	.2744786
allstocks	-.0370837	.5402623	-0.07	0.945	-1.09698	1.022812
allcash	-.8856448	.3700366	-2.39	0.017	-1.611589	-.1597004
initialstake	1.453396	1.243451	1.17	0.243	-.9860286	3.892821
acquirermarkettobook	-.0021439	.0178601	-0.12	0.904	-.0371821	.0328943

Alternative test second hypothesis

Distress measure 1

Source	SS	df	MS	Number of obs	=	1,629
				F(399, 1229)	=	2.54
Model	13744.7959	399	34.44811	Prob > F	=	0.0000
Residual	16681.9994	1,229	13.5736366	R-squared	=	0.4517
				Adj R-squared	=	0.2737
Total	30426.7953	1,628	18.6896777	Root MSE	=	3.6842

alternativebhar	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
firesales1	.2761167	.3206804	0.86	0.389	-.353025	.9052584
industryd	.1101041	.3621509	0.30	0.761	-.6003983	.8206066
distress1	0	(omitted)				
acquirertangibilityc~l	-1.862749	.7865113	-2.37	0.018	-3.405802	-.319695
acquirerleveragecont~l	.5285991	.7508335	0.70	0.482	-.9444582	2.001656
targettangibilitycon~l	1.334643	.6368271	2.10	0.036	.0852541	2.584031
targetleveragecontrol	.0225909	.6739903	0.03	0.973	-1.299708	1.34489
acquirertobinsq	.0784628	.1077073	0.73	0.466	-.1328477	.2897734
allstocks	-.052729	.5709902	-0.09	0.926	-1.172952	1.067494
allcash	-.8788197	.3835461	-2.29	0.022	-1.631297	-.1263421
initialstake	1.750419	1.312592	1.33	0.183	-.8247498	4.325588
acquirermarkettobook	-.0019155	.0183116	-0.10	0.917	-.037841	.0340099

Distress measure 2

Source	SS	df	MS	Number of obs	=	1,684
				F(404, 1279)	=	2.61
Model	13781.3101	404	34.1121538	Prob > F	=	0.0000
Residual	16744.0471	1,279	13.0915145	R-squared	=	0.4515
				Adj R-squared	=	0.2782
Total	30525.3572	1,683	18.1374671	Root MSE	=	3.6182

alternativebhar	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
firesales2	-.3297139	.4771698	-0.69	0.490	-1.265835	.6064077
industryd	.3536847	.3148927	1.12	0.262	-.2640783	.9714477
distress2	-.1844507	.3872678	-0.48	0.634	-.9442006	.5752993
acquirertangibilityc~l	-1.797429	.7559225	-2.38	0.018	-3.280413	-.3144443
acquirerleveragecont~l	.349007	.7187998	0.49	0.627	-1.061149	1.759163
targettangibilitycon~l	1.198485	.6020906	1.99	0.047	.0172918	2.379679
targetleveragecontrol	.3462823	.6619366	0.52	0.601	-.9523184	1.644883
acquirertobinsq	.0710301	.1039889	0.68	0.495	-.1329776	.2750377
allstocks	-.0106212	.5409223	-0.02	0.984	-1.071814	1.050571
allcash	-.8793182	.3701638	-2.38	0.018	-1.605513	-.1531232
initialstake	1.461609	1.246075	1.17	0.241	-.9829659	3.906184
acquirermarkettobook	-.0018389	.0178669	-0.10	0.918	-.0368906	.0332129

Alternative test fourth hypothesis

Distress measure 1

Source	SS	df	MS	Number of obs	=	1,629
				F(401, 1227)	=	2.53
Model	13763.6817	401	34.3233957	Prob > F	=	0.0000
Residual	16663.1136	1,227	13.5803697	R-squared	=	0.4524
				Adj R-squared	=	0.2734
Total	30426.7953	1,628	18.6896777	Root MSE	=	3.6852

alternativebhar	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
firesales1out	.5257443	.4694602	1.12	0.263	-.3952894	1.446778
industryd	.1270233	.3625363	0.35	0.726	-.5842364	.838283
out	-.2851225	.3241842	-0.88	0.379	-.9211392	.3508943
firesales1	-.0602477	.440691	-0.14	0.891	-.924839	.8043437
distress1	0	(omitted)				
acquirertangibilityc~l	-1.841898	.7870232	-2.34	0.019	-3.385958	-.2978378
acquirerleveragecont~l	.5533912	.7515017	0.74	0.462	-.9209795	2.027762
targettangibilitycon~l	1.360109	.6373511	2.13	0.033	.1096902	2.610527
targetleveragecontrol	-.0232359	.6753654	-0.03	0.973	-1.348235	1.301763
acquirertobinsq	.0826131	.1078289	0.77	0.444	-.1289363	.2941625
allstocks	-.0452208	.5712468	-0.08	0.937	-1.16595	1.075508
allcash	-.8784604	.3836504	-2.29	0.022	-1.631144	-.125777
initialstake	1.774354	1.313197	1.35	0.177	-.8020061	4.350713
acquirermarkettobook	-.0017736	.0183172	-0.10	0.923	-.0377101	.0341629

Distress measure 2

Source	SS	df	MS	Number of obs	=	1,684
				F(406, 1277)	=	2.59
Model	13788.1728	406	33.9610167	Prob > F	=	0.0000
Residual	16737.1844	1,277	13.106644	R-squared	=	0.4517
				Adj R-squared	=	0.2774
Total	30525.3572	1,683	18.1374671	Root MSE	=	3.6203

alternativebhar	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
firesales2out	-.3527804	.5131031	-0.69	0.492	-1.359398	.6538372
industryd	.3548577	.3150853	1.13	0.260	-.263284	.9729994
out	.0151243	.2921401	0.05	0.959	-.5580031	.5882516
firesales2	-.0896757	.5894212	-0.15	0.879	-1.246016	1.066665
distress2	-.183905	.3875088	-0.47	0.635	-.9441289	.5763188
acquirertangibilityc~l	-1.80567	.756449	-2.39	0.017	-3.28969	-.321651
acquirerleveragecont~l	.3609481	.719803	0.50	0.616	-1.051178	1.773074
targettangibilitycon~l	1.198173	.6025885	1.99	0.047	.0160006	2.380345
targetleveragecontrol	.3548523	.662475	0.54	0.592	-.9448067	1.654511
acquirertobinsq	.0717147	.1040682	0.69	0.491	-.1324488	.2758782
allstocks	-.0021762	.5414196	-0.00	0.997	-1.064346	1.059993
allcash	-.8833582	.3704198	-2.38	0.017	-1.610057	-.1566599
initialstake	1.445619	1.246992	1.16	0.247	-1.000759	3.891997
acquirermarkettobook	-.0019819	.0178786	-0.11	0.912	-.0370567	.0330928

Alternative test fifth hypothesis

Distress measure 1

Source	SS	df	MS	Number of obs	=	1,629
				F(401, 1227)	=	2.54
Model	13789.9596	401	34.3889268	Prob > F	=	0.0000
Residual	16636.8357	1,227	13.5589533	R-squared	=	0.4532
				Adj R-squared	=	0.2745
Total	30426.7953	1,628	18.6896777	Root MSE	=	3.6822

alternativebhar	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
firesales1competition	-.0003744	.0002132	-1.76	0.079	-.0007927	.0000439
industryd	.0986957	.3621507	0.27	0.785	-.6118075	.8091988
competition	-.0001349	.0004746	-0.28	0.776	-.001066	.0007963
firesales1	.5891771	.366715	1.61	0.108	-.1302807	1.308635
distress1	0	(omitted)				
acquirertangibilityc~l	-1.864039	.7861096	-2.37	0.018	-3.406307	-.3217713
acquirerleveragecont~l	.5428481	.75068	0.72	0.470	-.9299105	2.015607
targettangibilitycon~l	1.329247	.6366273	2.09	0.037	.0802489	2.578246
targetleveragecontrol	.0309372	.6736419	0.05	0.963	-1.29068	1.352555
acquirertobinsq	.0852422	.1078332	0.79	0.429	-.1263157	.2968
allstocks	-.0183853	.5711607	-0.03	0.974	-1.138945	1.102174
allcash	-.8854201	.3836564	-2.31	0.021	-1.638115	-.132725
initialstake	1.691976	1.312646	1.29	0.198	-.8833035	4.267256
acquirermarkettobook	-.0030739	.0183146	-0.17	0.867	-.0390054	.0328576

Distress measure 2

Source	SS	df	MS	Number of obs	=	1,684
				F(406, 1277)	=	2.59
Model	13798.4642	406	33.9863649	Prob > F	=	0.0000
Residual	16726.893	1,277	13.098585	R-squared	=	0.4520
				Adj R-squared	=	0.2778
Total	30525.3572	1,683	18.1374671	Root MSE	=	3.6192

alternativebhar	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
firesales2competition	-.000239	.00023	-1.04	0.299	-.0006903	.0002123
industryd	.3370219	.3159314	1.07	0.286	-.2827797	.9568235
competition	-.0001796	.0004629	-0.39	0.698	-.0010878	.0007285
firesales2	-.1356394	.5170147	-0.26	0.793	-1.149931	.878652
distress2	-.1833064	.3880192	-0.47	0.637	-.9445315	.5779187
acquirertangibilityc~l	-1.792935	.7561589	-2.37	0.018	-3.276386	-.3094852
acquirerleveragecont~l	.3289162	.7192366	0.46	0.648	-1.082099	1.739931
targettangibilitycon~l	1.20953	.602726	2.01	0.045	.0270877	2.391972
targetleveragecontrol	.3643813	.6623223	0.55	0.582	-.9349781	1.663741
acquirertobinsq	.0775791	.1042479	0.74	0.457	-.1269369	.282095
allstocks	-.0062538	.5413423	-0.01	0.991	-1.068272	1.055764
allcash	-.8799717	.3706168	-2.37	0.018	-1.607056	-.1528869
initialstake	1.451249	1.247247	1.16	0.245	-.995629	3.898126
acquirermarkettobook	-.0021429	.017876	-0.12	0.905	-.0372124	.0329266

Alternative test sixth hypothesis

Distress measure 1

Source	SS	df	MS	Number of obs	=	1,629
				F(401, 1227)	=	2.52
Model	13753.6672	401	34.2984219	Prob > F	=	0.0000
Residual	16673.1281	1,227	13.5885315	R-squared	=	0.4520
				Adj R-squared	=	0.2729
Total	30426.7953	1,628	18.6896777	Root MSE	=	3.6863

alternativebhar	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
firesales1assetspeci~y	46.28423	124.3584	0.37	0.710	-197.6944	290.2628
industryd	.127261	.3629765	0.35	0.726	-.5848622	.8393843
assetspecificity	16.23727	97.60193	0.17	0.868	-175.2479	207.7224
firesales1	.2535427	.3223379	0.79	0.432	-.3788518	.8859371
distress1	0	(omitted)				
acquirertangibilityc~l	-1.856697	.7874455	-2.36	0.019	-3.401585	-.3118079
acquirerleveragecont~l	.5549025	.7542566	0.74	0.462	-.9248729	2.034678
targettangibilitycon~l	1.349379	.6374731	2.12	0.034	.0987213	2.600037
targetleveragecontrol	-.0229064	.67696	-0.03	0.973	-1.351034	1.305221
acquirertobinsq	.0769283	.1078188	0.71	0.476	-.1346012	.2884579
allstocks	-.0636759	.5715697	-0.11	0.911	-1.185038	1.057686
allcash	-.8863279	.3839632	-2.31	0.021	-1.639625	-.1330307
initialstake	1.781541	1.314223	1.36	0.175	-.7968325	4.359914
acquirermarkettobook	-.0014789	.018331	-0.08	0.936	-.0374424	.0344847

Distress measure 2

Source	SS	df	MS	Number of obs	=	1,684
				F(406, 1277)	=	2.59
Model	13793.363	406	33.9738004	Prob > F	=	0.0000
Residual	16731.9942	1,277	13.1025797	R-squared	=	0.4519
				Adj R-squared	=	0.2776
Total	30525.3572	1,683	18.1374671	Root MSE	=	3.6197

alternativebhar	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
firesales2assetspeci~y	49.15816	118.8756	0.41	0.679	-184.0547	282.371
industryd	.3638368	.3152267	1.15	0.249	-.2545822	.9822559
assetspecificity	22.05782	92.70898	0.24	0.812	-159.8208	203.9365
firesales2	-.3543933	.4798475	-0.74	0.460	-1.295769	.5869828
distress2	-.1903861	.3878023	-0.49	0.624	-.9511857	.5704135
acquirertangibilityc~l	-1.800144	.7563755	-2.38	0.017	-3.28402	-.3162691
acquirerleveragecont~l	.380421	.7211565	0.53	0.598	-1.034361	1.795203
targettangibilitycon~l	1.215488	.6026305	2.02	0.044	.0332333	2.397742
targetleveragecontrol	.3059803	.66355	0.46	0.645	-.9957876	1.607748
acquirertobinsq	.0681993	.1040791	0.66	0.512	-.1359855	.2723841
allstocks	-.0197165	.5415272	-0.04	0.971	-1.082097	1.042664
allcash	-.8847305	.3703695	-2.39	0.017	-1.61133	-.1581311
initialstake	1.492163	1.247151	1.20	0.232	-.9545264	3.938852
acquirermarkettobook	-.0012973	.0178838	-0.07	0.942	-.0363821	.0337876

Alternative test seventh hypothesis

Distress measure 1

Source	SS	df	MS	Number of obs	=	583
				F(280, 302)	=	2.33
Model	20478.3016	280	73.1367915	Prob > F	=	0.0000
Residual	9470.51329	302	31.3593155	R-squared	=	0.6838
				Adj R-squared	=	0.3906
Total	29948.8149	582	51.4584449	Root MSE	=	5.5999

alternativebhar	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
distress1unlisted	-.2549716	13.39967	-0.02	0.985	-26.62351	26.11356
unlisted	0	(omitted)				
distress1	0	(omitted)				
acquirertangibilitycontrol	-4.629202	2.49842	-1.85	0.065	-9.545718	.2873137
acquirerleveragecontrol	-.0555148	2.165478	-0.03	0.980	-4.31685	4.205821
targettangibilitycontrol	5.794	1.913859	3.03	0.003	2.027812	9.560187
targetleveragecontrol	-.7115222	1.392232	-0.51	0.610	-3.451226	2.028181
acquirertobinsq	.0648781	.2677652	0.24	0.809	-.4620437	.5918
allstocks	-1.533	1.600138	-0.96	0.339	-4.681833	1.615832
allcash	-2.018251	1.079773	-1.87	0.063	-4.143083	.1065807
initialstake	10.54751	4.336669	2.43	0.016	2.0136	19.08143
acquirermarkettobook	.0106778	.0663605	0.16	0.872	-.1199098	.1412654

Distress measure 2

Source	SS	df	MS	Number of obs	=	547
				F(284, 262)	=	1.10
Model	210.081949	284	.739725172	Prob > F	=	0.2140
Residual	176.003045	262	.671767349	R-squared	=	0.5441
				Adj R-squared	=	0.0500
Total	386.084994	546	.707115374	Root MSE	=	.81961

alternativebhar	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
distress2unlisted	1.848959	1.568639	1.18	0.240	-1.239786	4.937703
unlisted	0	(omitted)				
distress2	0	(omitted)				
acquirertangibilitycontrol	.1124876	.3803507	0.30	0.768	-.6364457	.8614208
acquirerleveragecontrol	-.1335734	.3445254	-0.39	0.699	-.8119645	.5448177
targettangibilitycontrol	-.1366827	.327686	-0.42	0.677	-.781916	.5085506
targetleveragecontrol	-.1816061	.1930914	-0.94	0.348	-.5618147	.1986025
acquirertobinsq	.0716693	.0446453	1.61	0.110	-.01624	.1595786
allstocks	-.211812	.2354554	-0.90	0.369	-.6754377	.2518137
allcash	.0539235	.1806142	0.30	0.766	-.3017166	.4095637
initialstake	3.197958	.7189566	4.45	0.000	1.782289	4.613626
acquirermarkettobook	-.0014928	.0081912	-0.18	0.856	-.0176217	.0146362

Alternative test eighth hypothesis

Distress measure 1

Source	SS	df	MS	Number of obs	=	1,624
				F(402, 1221)	=	2.52
Model	13795.3938	402	34.3169	Prob > F	=	0.0000
Residual	16630.911	1,221	13.6207297	R-squared	=	0.4534
				Adj R-squared	=	0.2734
Total	30426.3048	1,623	18.746953	Root MSE	=	3.6906

alternativebhar	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
distress1unlistedipovol	.0007923	.0011156	0.71	0.478	-.0013963	.002981
distress1unlistedspread	-.1306525	.2768124	-0.47	0.637	-.6737332	.4124281
spread	.6591532	.3635946	1.81	0.070	-.0541862	1.372493
ipovol	.0000825	.0010897	0.08	0.940	-.0020553	.0022203
unlisted	-.2974696	4.270808	-0.07	0.944	-8.676405	8.081466
distress1	-.6822571	1.74197	-0.39	0.695	-4.099843	2.735328
acquirertangibilitycontrol	-1.847561	.7884812	-2.34	0.019	-3.394489	-.3006328
acquirerleveragecontrol	.5244713	.7548371	0.69	0.487	-.9564502	2.005393
targettangibilitycontrol	1.347765	.6386947	2.11	0.035	.0947046	2.600826
targetleveragecontrol	.1367273	.5691182	0.24	0.810	-.9798306	1.253285
acquirertobinsq	.0828068	.1080192	0.77	0.443	-.129117	.2947305
allstocks	-.0053336	.5779483	-0.01	0.993	-1.139215	1.128548
allcash	-.8856371	.3851547	-2.30	0.022	-1.641275	-.1299988
initialstake	1.586068	1.319678	1.20	0.230	-1.003019	4.175155
acquirermarkettobook	-.001775	.0183572	-0.10	0.923	-.0377902	.0342403

Distress measure 2

Source	SS	df	MS	Number of obs	=	1,679
				F(406, 1272)	=	2.59
Model	13817.4317	406	34.0330829	Prob > F	=	0.0000
Residual	16707.4398	1,272	13.1347797	R-squared	=	0.4527
				Adj R-squared	=	0.2780
Total	30524.8714	1,678	18.1912225	Root MSE	=	3.6242

alternativebhar	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
distress2unlistedipovol	-.0006653	.0011243	-0.59	0.554	-.002871	.0015405
distress2unlistedspread	.1516261	.2748342	0.55	0.581	-.3875521	.6908043
spread	.5477118	.3569344	1.53	0.125	-.1525331	1.247957
ipovol	.0006352	.0010364	0.61	0.540	-.0013981	.0026684
unlisted	.4825859	4.115535	0.12	0.907	-7.591397	8.556568
distress2	.3610777	1.758215	0.21	0.837	-3.088243	3.810398
acquirertangibilitycontrol	-1.799084	.7570121	-2.38	0.018	-3.284213	-.313954
acquirerleveragecontrol	.3330824	.7219228	0.46	0.645	-1.083208	1.749373
targettangibilitycontrol	1.244042	.603283	2.06	0.039	.0605026	2.427581
targetleveragecontrol	.7264511	.4779043	1.52	0.129	-.2111163	1.664019
acquirertobinsq	.0719845	.1042297	0.69	0.490	-.1324965	.2764655
allstocks	-.0124228	.5470958	-0.02	0.982	-1.085732	1.060887
allcash	-.8864405	.3714571	-2.39	0.017	-1.615176	-.1577045
initialstake	1.303429	1.250499	1.04	0.297	-1.149838	3.756697
acquirermarkettobook	-.0024566	.0179379	-0.14	0.891	-.0376478	.0327345

Alternative test ninth hypothesis

Distress measure 1

Source	SS	df	MS	Number of obs	=	1,629
				F(400, 1228)	=	2.53
Model	13754.6857	400	34.3867143	Prob > F	=	0.0000
Residual	16672.1096	1,228	13.5766365	R-squared	=	0.4521
				Adj R-squared	=	0.2736
Total	30426.7953	1,628	18.6896777	Root MSE	=	3.6846

alternativebhar	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
distress1crisis	-.5407418	.6102782	-0.89	0.376	-1.738045	.6565616
crisis	.0493541	.763441	0.06	0.948	-1.448439	1.547147
distress1	.4071978	.2887576	1.41	0.159	-.1593151	.9737106
acquirertangibilitycontrol	-1.834393	.7875077	-2.33	0.020	-3.379402	-.2893833
acquirerleveragecontrol	.5223052	.7525601	0.69	0.488	-.9541407	1.998751
targettangibilitycontrol	1.344583	.6379677	2.11	0.035	.0929558	2.59621
targetleveragecontrol	.1383434	.5662326	0.24	0.807	-.972547	1.249234
acquirertobinsq	.0806206	.1077588	0.75	0.455	-.1307912	.2920324
allstocks	-.0393529	.5712269	-0.07	0.945	-1.160042	1.081336
allcash	-.8940428	.3838252	-2.33	0.020	-1.647069	-.1410171
initialstake	1.772821	1.312814	1.35	0.177	-.8027852	4.348426
acquirermarkettobook	-.0023596	.0183133	-0.13	0.898	-.0382883	.0335691

Distress measure 2

Source	SS	df	MS	Number of obs	=	1,684
				F(404, 1279)	=	2.60
Model	13769.6142	404	34.0832035	Prob > F	=	0.0000
Residual	16755.743	1,279	13.1006591	R-squared	=	0.4511
				Adj R-squared	=	0.2777
Total	30525.3572	1,683	18.1374671	Root MSE	=	3.6195

alternativebhar	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
distress2crisis	.4253283	.6116849	0.70	0.487	-.7746877	1.625344
crisis	-.2605204	.7353724	-0.35	0.723	-1.703189	1.182148
distress2	-.4560277	.2522179	-1.81	0.071	-.950834	.0387786
acquirertangibilitycontrol	-1.773406	.7556548	-2.35	0.019	-3.255865	-.2909468
acquirerleveragecontrol	.3557152	.7207517	0.49	0.622	-1.05827	1.769701
targettangibilitycontrol	1.205482	.6027466	2.00	0.046	.0230012	2.387962
targetleveragecontrol	.7101481	.475778	1.49	0.136	-.223243	1.643539
acquirertobinsq	.0694101	.1041083	0.67	0.505	-.1348316	.2736518
allstocks	-.053118	.5410577	-0.10	0.922	-1.114576	1.00834
allcash	-.8920722	.3703622	-2.41	0.016	-1.618656	-.1654881
initialstake	1.476934	1.245089	1.19	0.236	-.9657063	3.919575
acquirermarkettobook	-.0015505	.0178911	-0.09	0.931	-.0366496	.0335485

Alternative test tenth hypothesis

Distress measure 1

Source	SS	df	MS	Number of obs	=	1,629
				F(400, 1228)	=	2.53
Model	13754.8199	400	34.3870499	Prob > F	=	0.0000
Residual	16671.9754	1,228	13.5765272	R-squared	=	0.4521
				Adj R-squared	=	0.2736
Total	30426.7953	1,628	18.6896777	Root MSE	=	3.6846

alternativebhar	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
distress1experience	-.0017843	.0102614	-0.17	0.862	-.021916	.0183475
experience	-.0039928	.0060884	-0.66	0.512	-.0159377	.0079521
distress1	.3599165	.3243727	1.11	0.267	-.2764696	.9963025
acquirertangibilitycontrol	-1.936818	.7900865	-2.45	0.014	-3.486887	-.3867486
acquirerleveragecontrol	.6944842	.7723408	0.90	0.369	-.8207695	2.209738
targettangibilitycontrol	1.356822	.6376864	2.13	0.034	.1057469	2.607898
targetleveragecontrol	.087914	.5685201	0.15	0.877	-1.027464	1.203292
acquirertobinsq	.090094	.1085169	0.83	0.407	-.1228049	.302993
allstocks	-.0795119	.5713562	-0.14	0.889	-1.200454	1.04143
allcash	-.8810702	.3835872	-2.30	0.022	-1.633629	-.1285114
initialstake	1.737839	1.311766	1.32	0.185	-.835711	4.311389
acquirermarkettobook	-.0006059	.0183767	-0.03	0.974	-.0366591	.0354473

Distress measure 2

Source	SS	df	MS	Number of obs	=	1,684
				F(404, 1279)	=	2.60
Model	13775.989	404	34.0989827	Prob > F	=	0.0000
Residual	16749.3682	1,279	13.0956749	R-squared	=	0.4513
				Adj R-squared	=	0.2780
Total	30525.3572	1,683	18.1374671	Root MSE	=	3.6188

alternativebhar	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
distress2experience	.0040404	.008105	0.50	0.618	-.0118603	.019941
experience	-.0063912	.0064915	-0.98	0.325	-.0191263	.0063439
distress2	-.3896119	.2342089	-1.66	0.096	-.8490878	.069864
acquirertangibilitycontrol	-1.846503	.7586115	-2.43	0.015	-3.334763	-.3582436
acquirerleveragecontrol	.5031028	.739622	0.68	0.496	-.9479029	1.954108
targettangibilitycontrol	1.233327	.6016021	2.05	0.041	.0530913	2.413562
targetleveragecontrol	.5648037	.5073009	1.11	0.266	-.4304297	1.560037
acquirertobinsq	.0825541	.1047865	0.79	0.431	-.1230182	.2881263
allstocks	-.0537298	.5407278	-0.10	0.921	-1.114541	1.007081
allcash	-.8781201	.3704712	-2.37	0.018	-1.604918	-.1513221
initialstake	1.485975	1.244449	1.19	0.233	-.9554107	3.92736
acquirermarkettobook	-.0011065	.0179367	-0.06	0.951	-.036295	.034082

Alternative test eleventh hypothesis

Distress measure 1

Source	SS	df	MS	Number of obs	=	1,361
				F(385, 975)	=	2.32
Model	14414.6458	385	37.4406385	Prob > F	=	0.0000
Residual	15762.8088	975	16.1669834	R-squared	=	0.4777
				Adj R-squared	=	0.2714
Total	30177.4546	1,360	22.1893049	Root MSE	=	4.0208

alternativebhar	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
distress1size	.0079522	.0287708	0.28	0.782	-.0485077	.0644121
size	-.0007002	.0119198	-0.06	0.953	-.0240916	.0226913
distress1	.2061595	.3471414	0.59	0.553	-.4750709	.8873898
acquirertangibilitycontrol	-2.56001	.9891146	-2.59	0.010	-4.501049	-.6189714
acquirerleveragecontrol	.7499581	.9231437	0.81	0.417	-1.061619	2.561535
targettangibilitycontrol	1.932309	.7944728	2.43	0.015	.3732351	3.491382
targetleveragecontrol	.2268723	.716975	0.32	0.752	-1.180119	1.633864
acquirertobinsq	.1219964	.1351658	0.90	0.367	-.1432529	.3872458
allstocks	-.1276125	.7001163	-0.18	0.855	-1.501521	1.246296
allcash	-.9740629	.4786095	-2.04	0.042	-1.913286	-.0348396
initialstake	1.339688	1.611105	0.83	0.406	-1.821945	4.501321
acquirermarkettobook	-.010573	.0238956	-0.44	0.658	-.0574657	.0363198

Distress measure 2

Source	SS	df	MS	Number of obs	=	1,402
				F(390, 1011)	=	2.38
Model	14477.2039	390	37.1210355	Prob > F	=	0.0000
Residual	15793.9681	1,011	15.6221247	R-squared	=	0.4783
				Adj R-squared	=	0.2770
Total	30271.1719	1,401	21.6068322	Root MSE	=	3.9525

alternativebhar	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
distress2size	.0016552	.0237563	0.07	0.944	-.0449621	.0482724
size	.0003879	.012303	0.03	0.975	-.0237544	.0245303
experience	-.0043905	.0059555	-0.74	0.461	-.016077	.007296
distress2	-.4772839	.2830563	-1.69	0.092	-1.032729	.0781613
acquirertangibilitycontrol	-2.576367	.9532574	-2.70	0.007	-4.446956	-.7057769
acquirerleveragecontrol	.7527261	.9242797	0.81	0.416	-1.061	2.566452
targettangibilitycontrol	1.862217	.7645707	2.44	0.015	.3618895	3.362544
targetleveragecontrol	.7416214	.5996543	1.24	0.216	-.4350882	1.918331
acquirertobinsq	.1170383	.1312729	0.89	0.373	-.1405602	.3746369
allstocks	-.1371624	.6662828	-0.21	0.837	-1.444618	1.170293
allcash	-.9887551	.463096	-2.14	0.033	-1.897495	-.0800157
initialstake	1.109296	1.547262	0.72	0.474	-1.926917	4.145508
acquirermarkettobook	-.0093147	.0234165	-0.40	0.691	-.0552652	.0366357