Opportunity makes a thief

ERASMUS UNIVERSITY ROTTERDAM
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Master Thesis Financial Economics

Research question: What is the effect of ownership structure on insider trading profitability?

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"This research investigates the relationship between ownership structure and insider trading profitability, building on the theoretical foundation of ownership structure, through active monitoring, diminishing information asymmetry and therewith reducing insider trading profitability and as such mitigating illegal insider trading. This research makes use of the cumulative abnormal returns for both insider purchases and sales as a proxy for illegal insider trading and the debt-to-equity ratio, blockholders and outside blockholders as effects of ownership structure. This research finds all effects of ownership structure to have a negative effect on insider trading profitability. Besides that, this research finds that increasing the size of the blockholders does not improve the diminishing effect of blockholders on insider trading profitability."

Keywords: illegal insider trading; ownership structure; capital structure; ownership concentration; external ownership; blockholder; active monitoring; information asymmetry

JEL Classification Codes: G14, G32, G34, P37, K42

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Preface

After 6 years of studying in Rotterdam (including half a year in Madrid), my student life, and my parents will most likely happily confirm this, has truly come to an end. Following the words of Mark Twain: *"Twenty years from now you will be more disappointed by the things that you didn't do than by the ones you did do"*; I can look back to a student life fulfilled to its fullest potential, which I have undeniably enjoyed. As such, this Financial Economics thesis not only signifies the end of this master, but rather stands symbol for the end of my student life. Knowing that motivation, for me, materializes out of enthusiasm, I have therefore chosen a research subject that very much enthuses me. I wholeheartedly hope that the readers of this master thesis, will be able to relive some of this enthusiasm and that this spirit consequently results in making an impact on the academic knowledge surrounding this subject.

Also, in this preface, I would very much like to express my gratitude towards the supervisor of this thesis, Prof. Dr. Patrick Verwijmeren for his positive encouraging attitude, flexibility and his coherent feedback, when guiding me in this master thesis research.

Furthermore, I would like to thank my family, girlfriend and friends for their unfailing support during my studying years and more specifically, this thesis.

Wessel van den Broek

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Executive summary

Many researches have identified the adverse effects of illegal insider trading on both the firm, shareholders and the financial market (Bettis, Coles & Lemmon, 1999; Leland, 1992; Fishman & Haggerty, 1992). Policies by the SEC focused on mitigating illegal insider trading have mostly found to be ineffective (Seyhun, 1992; Bris, 2003; Jagolinzer, 2009; Dalko & Wang, 2016). Also, research has indicated that currently still a lot of insider trading takes places (Augustin, Brenner & Subrahmanyam, 2014). Firms on itself can also implement several policies in search of diminishing or eliminating illegal insider trading. However, research has indicated that apart from these measures often being ineffective, they will also weigh heavy on company culture, cost of compensation, cost of capital and existing shareholders and therewith are undesirable (Anderson, 2016). This research finds illegal insider trading to be an agency problem between the insiders and the shareholders; an action from which the shareholders face the negative effects. As identified by Jensen & Meckling (1976), active monitoring by shareholders can be a concept effective in mitigating these agency problems. Also identified in this research is that the level of active monitoring depends very much on the form of ownership, as such this research investigates the mitigating effect of ownership structure on insider trading profitability.

Three hypotheses are formed, making use of three independent variables, namely: the debt-to-equity ratio, blockholders and outside blockholders. Making use of a multilinear regression, including control variables, these variables are regressed against the cumulative abnormal returns for both insider purchases and sales. This research finds all hypothesized effects of ownership structure to have a negative effect on insider trading profitability. Besides that, this research finds that increasing the size of the blockholders does not improve the effect of blockholders on illegal insider trading. Contrarily, increasing the size of blockholders decreases the mitigating effect of blockholders on illegal insider trading. Concluding this research with the notion that companies should focus on outside ownership concentration, as opposed to more diluted shareholders or inside blockholders. Also, companies should be aware of cozy cartels between managers and dominant shareholders. Lastly, companies can expect all efforts to be most present when insiders sell their stock, as opposed to insiders purchasing stock.

Abbreviations

AMEX	American Stock Exchange
AR	Abnormal Returns
CAAR	Cumulative Abnormal Average Returns
CAR	Cumulative Abnormal Returns
CFO	Chief Financial Officer
CRSP	The Center for Research in Security Prices
CUSIP	Committee on Uniform Security Identification Procedures
E-Index	Bebchuk Index
ESOP	Employee Stock Ownership Plan
GIM-Index	Gompers, Ishii & Metrick Index
ITSA	Insider Trading Sanctions Ac
ITSFEA	Insider Trading and Securities Fraud Enforcement Act
LLSV	Rafael La Porta, Florencio Lopez de Silanes, Andrei Shleifer & Robert Vishny
NASDAQ	National Association of Securities Dealers Automated Quotations
NPV	Net Present Value
NYSE	New York Stock Exchange
R&D	Research & Development
ROA	Return on Assets
S&P	Standard & Poor's
SEA	Securities and Exchange Act
SEC	U.S Securities and Exchange Commission
SIC	Standard Industrial Classification
TFDIF	Thomson Financial Data Insiders Feed
US	United States
VIF	Variance Inflation Factor
WACC	Weighted Average Cost of Capital

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1.0 - Introduction

On May 27, 1933, President Franklin Roosevelt signed the infamous Securities Act. While signing the act, he gazed up to the U.S diplomats and stated: "As you and I know, the fundamental trouble with this whole Stock Exchange crowd is their complete lack of elementary education. I do not mean lack of college diplomas, etc., but just inability to understand the country or the public or their obligation to their fellow man. This is intended to correct some of the evils which have been so glaringly revealed in the private exploitation of the public's money" (Roosevelt, 1933). At that day history was written and these words have withstood the test of time, finding their place in the history books. For a short period in history, the air around the "evils" in the financial markets seemed clear. However, when in the 1980s the first prosecutions concerning insider trading took place, it seemed like the financial markets were still far from a solution. Between 1980 and 2018 an extra 115.000 researches have been performed into insider trading and the mania around insider trading even infected Hollywood. As Gordon Gekko would say: "The most valuable commodity I know of . . . is information."[1]

Recently, in 2006, Linda Thomson, Enforcement Director for the Securities and Exchange Commission, in front of the U.S. Senate Committee, mentioned that she, since 2001, "has brought 300 actions against over 600 individuals and entities for insider trading violations, and frozen millions of dollars in illicit trading proceeds". Also, she noted that a large part of the cases prosecuted by the SEC involve around insider trading (i.e. 7-12%). Besides that, Thomson (2006) mentions that it is very hard for the SEC to prove the illegality of insider trading, as suspicious trading is not necessarily illegal. She further mentioned that among others, these notions have resulted in insider trading still being a high enforcement priority for the SEC (Burke & Jarkowski, 2007). Even more recently (June 2014) a research by professors at the Stern School of Business and McGill University, studying a large number of transactions between 1996-2012, suggested that 25% of all public company deals involve some kind of illegal insider trading (Augustin, Brenner & Subrahmanyam, 2014).

[1] Wikiquote – Wall Street (1987)

Besides that, as indicated by many researches, the current SEC regulation seemed not be highly effective in discouraging insiders trading on non-public information (Bris, 2005; Jagolinzer, 2009; Dalko & Wang, 2016) and corporate policies in restricting illegal insider trading are ineffective and weigh heavily on the firm (and shareholders) (Anderson, 2016). Also must be noted that the financial markets are built on trust and investor confidence and form a fundamental shackle for other industries. Not being able to effectively retain trust in the financial market and the prevention of illegal insider trading will heavily impact the functioning of the capital markets (i.e. increased cost of capital & lemon-problems).

The essence of this problem lies within two concepts. To begin with, there are agency problems; due to separate ownership and control principles, the incentives of managers and shareholders are not properly aligned. Secondly, there is information asymmetry; insider can profit from an informational advantage and make a profit at the cost of the outsider. In 1976 Jensen & Meckling already proposed a concept with the goal of mitigating agency problems, namely: active monitoring. Moreover, previous research has also concluded that monitoring by shareholders is effective in reducing information asymmetry (Eldabry, Gounopoulos & Skinner, 2015). Interesting therefore is the investigation of the effect of different ownership structures (concentrated-dispersed & internal-external) on the profitability of insider trading. Very few researches have been performed on the relationship between insider trading and ownership structure. The researches that have been performed into this relationship make use of a proxy measure to represent an explanatory part of insider trading (e.g. compliance/stringency to/of regulations) (Beny, 2004; Bajo, Bigelli, Hillier & Petracci, 2009; Boehmer & Kelley, 2009). Also, researches on this relationship focus on a company-specific segment (e.g. only directors), short data time periods and incomplete data collection methods (e.g. not include historical ownership filings) (Fidrmuc, Goergen & Renneboog, 2006; Betzer & Theissen, 2009). This research will make use of a common profitability measurement for insider trading and an unique hand-collected dataset on different ownership structures of publically-traded firms. Consequently, this led to the research question:

"What is the effect of ownership structure on insider trading profitability?"

This research finds capital structure (decreasing the debt-to-equity ratio), increasing ownership concentration and increasing external ownership to have a significant negative effect on insider trading profitability. This result is the largest for external ownership and most present in insider sales. Besides that, the effect of both external ownership and ownership concentration diminishes as the blockholder grows in size.

This research will begin with the assessment of previous literature and establish a theoretical framework, in the Literature Review. Following in the sections Data & Methodology, the data that is used will be presented and consequently fitting research methods will be identified. Following, in the section Results, the results based on the analysis will be presented. Finally, the results are discussed in the section Discussion and fitting conclusions will be drawn in the section Conclusion.

2.0 - Literature Review

2.1 - Insider trading

In the following section the concept of insider trading is explained, consequently regulation regarding insider trading and the consequences of insider trading will be discussed.

An insider is defined as a person who has access to non-public information. Registered insiders therewith can fulfill a wide spectrum of corporate functions, among others directors, senior officers and large shareholders (owning more than 5% of the shares). The common fear surrounding insider trading is concerned with the registered insiders using non-public information in benefits and consequently create an informative advantage. Vice versa this entails the non-insiders being harmed by the informative advantage of the insiders by entering unfavourable trades on their behalf. A common example of insider trading is concerned with trading around takeovers. As one might know, an abundance of research suggests the share price of the target will increase. Studies typically find a higher cumulative abnormal return for the target firms, which however, as research shows, is diminishing over the last decades to 3.5% in 2010-2016 (Dutordoir, Verwijmeren, Wu & Vagenas-Nanos, 2018). Typically, an insider wanting to benefit from such information can proceed in two actions. Firstly, an insider, in case of 'good takeovers', can buy the shares of the target company at a lower price before the takeover announcement and consequently sell after the target share price increase, after the announcement. Also, an insider, in case of 'bad takeovers', where a target company share price decrease is expected, can sell their stocks of the target company at a higher price than after the takeover announcement. A distinction between active and passive trading can be made, where increasing your purchases is identified as 'active trading' and postponing your sales is identified as 'passive trading' (Andrade, Mitchell, & Stattford, 2001). Logically, many alternative scenarios exist where profits can be made or losses can be avoided by insider trading.

Important to note here however, is the (il)legality of insider trading. Insider trading, when in compliance with insider trading regulations, as imposed by the SEC and U.S. Congress is legal. However, as this research will assess in the next paragraph, identifying the boundaries of the legal landscape in insider trading is found to be very difficult.

It is clear that insiders can have a potential informational benefit when participating in insider trading. However, the question that naturally arises is whether insiders actually make use of this 'opportunity'. Elliot, Morse, and Richardson (1984) and Givoly and Palmon (1985), analyse the timing and volume of insider transaction surrounding news announcement. In these studies, they conclude that corporate insiders, around these news announcements, do not trade on inside information. However, much more contrarian and recent evidence exist, suggesting that corporate insiders indeed make use of this profitable opportunity by trading on insider information (Keown & Pinkerton, 1981; King, 2009; Goa & Oler, 2012; Verwijmeren, Berkman & McKenzie, 2016). Besides that, research by Augustin, Brenner & Subrahmanyam (2014) suggests that 25% of all public company deals involve some kind of illegal insider trading. Consequently can be concluded that informed inside trading does exist, where, in the following paragraphs the regulatory framework, the impact and the relationship with ownership structure of insider trading will be analysed.

2.1.1 - Insider trading regulation

In response to the Great Depression, and the stock market crash in 1929 ("Black Tuesday") in particular, the U.S. government initiated a series of public work projects, federal programs and financial reforms known as 'The New Deal' (Bentson, 1973). The Securities and Exchange Act of 1934 was one of the quickest to implement and, as some believe, one of the most successful programs of The New Deal. Although many reformers pursued the implementation of "blue skies" legislation, which entailed that all securities sold and traded were to be approved by the federal government, Franklin Roosevelt preferred legislation evolving around the concept of "disclosure" (Bentson, 1973). Consequently the Securities and Exchange Act of 1934 passed in U.S Congress and all companies whose securities are publically traded are mandated to disclose a large amount of (financial) information to the Securities and Exchange Commission (SEC).

If one analyses the impact of the Securities and Exchange Act (SEA) of 1934 on insider trading, one can identify four main regulatory principles. To begin with Section 10(b) of the SEA prohibits trades on material, non-public information. This regulation is the basic principle in the prohibition of insider trading and applies to anyone who comes into possession of such information and owes a fiduciary duty (Nasser & Agrawal, 2012).

Secondly, under Section 16(a) of the SEA, all corporate insiders (i.e. directors, corporate officers and blockholders holding at least 5% of the shares) are required to report their trades to the SEC. These data become a matter of public information and through the reporting serve as a regulatory principle in insider trading. Thirdly, Section 16(b) of the SEA, requires all corporate insiders to hand over any profits made from round-chip trades (i.e. purchase made after a sale, or vice-versa) to the company, made within a six-month period. This rule is commonly known as the 'short-swing rule' and applies to all trades, irrespective of the trade involving non-public information. The short-swing rule applies to prevent of the most basic form of illegal insider trading. Finally, Section 14(e-3) of the SEA prohibits anyone from trading on material, non-public information concerning an upcoming tender offer, when the acquirer has taken substantial steps in the bidding process. This rule also prohibits insiders from either the acquirer of the target firm from divulging of confidential information to anyone who might trade on this confidential information (Nasser & Agrawal, 2012).

Following several U.S. Supreme Court Rulings in 1969 (SEC vs. Texas Gulf Sulfur Co.) and 1980 (Chiarella vs. United States) have further reinforced the SEA into usage in practice. Illegal insider trading became a top priority in the 1980s for the SEC. However, in most cases until this point, the financial benefits of an illegal insider trade far outweighed the potential financial penalties. Therefore, in 1984, the Insider Trading Sanctions Act (ITSA) passed in Congress to aid the SEC in efficiently prosecute and therewith further mitigate illegal insider trading. ITSA entails that monetary penalties of illegal insider trading can amount to three times the profits made or losses avoided of the illegal insider trade. The sanctions resulting from illegal insider trading have been further made more severe, when the Insider Trading and Securities Fraud Enforcement Act (ITSFEA) passed Congress in 1988. Apart from the civil sanctions that the SEC can impose, the Justice Department is also able to further impose penalties, in the form of monetary penalties, but also incarceration as deemed necessary as a result of violations of the law (SEC, 1990).

Meulbroek (1992) however argues that insider trades based on non-public information, and therewith prohibited by SEC rule 10b5, would not report their trades to the SEC. Other research argues the invalidity of this assumption. To begin with, Agrawal & Nasser (2012) mention the intense investor focus on trades reported by registered insiders, suggests that these investors believe that these trades to be informed.

Secondly, they mention that it is hard to assume that top management and executives learn about important events involving their companies from the media. Thirdly, Agrawal & Nasser (2012) find substantial evidence from prior research that registered insider trade profitably around several important company events such as earnings restatements and announcements, dividend initiations, stock repurchases, seasoned equity offerings and bankruptcy filings, suggesting that insider trades are informative, on average (Nasser & Agrawal, 2012). In line with research by Nasser & Agrawal (2012), many researches suggest that the current SEC regulation concerning insider trading has seemed to be ineffective in discouraging insiders from trading on non-public information (Seyhun, 1992; Bris, 2003; Jagolinzer, 2009; Dalko & Wang, 2016).

2.1.2 - The impact of insider trading

The following paragraph assesses the impact of insider trading on both the market and the respective company, consequently the impact will be reinforced with the societal relevance of this research.

The efficient market theory is a central concept in research on financial economics. The efficient market theory proposes an efficient market in which the prices of assets fully reflect all available information. Consequently it is merely impossible to repeatedly 'beat the market' and the market will react accordingly to new information made public (Fama, 1970). Much research has been performed in the profitability of insider trading and has been deemed evidence inconsistent due to the violation of the market efficiency theory (Zaman & Rozeff, 1988). A generally overlooked implication in these researches however is the idea that in the financial trading market there exists a loser for every winner (Aboody & Lev, 2000). Maug (2002) mention the expropriation of an outsider by insiders through insider trading and concluded insider trading to discourage outside ownership. Seyhun (1986) mentions it is therefore very important to investigate the costly effect of the informed traders on the uninformed traders. Informed traders' abnormal returns/profits, decrease the opposing traders' return, as such, ignoring insider trading profits can result to an unwanted overstatement of realizable abnormal profits to any trading rule, where this effect is more present in smaller firms (Seyhun, 1986). Fishman & Haggerty (1992) also argue that insider trading has negative effects on the market.

They argue that insider trading leads to i) loss of investor confidence in capital markets ii) loss of liquidity in the markets and iii) perverse managerial incentives. When insider trading is allowed and profitable, it creates perverse incentives by allowing insiders to profit both on good as well as bad news. Also, it encourages managers to invest in risky projects, incentivizes managers to delay public disclosure and overall slows down corporate decision making (Fishman & Haggerty, 1992).

To conclude they show that under certain circumstances, insider trading leads to less efficient stock prices. This can be contributed to the two adverse effects on the competitiveness of the market, where it deters non-insider traders from trading and acquiring information and it skews the distribution of information held by traders toward one trader, herewith concluding the negative effect of insider trading on the efficiency of the market (Fishman & Haggerty, 1992). This effect is researched in insider trading literature as the 'crowding-out effect', where outside investors are crowded out of information collection due to information asymmetry, and reduce investment, due to the fact that they know that insider trading limits the gains and profitability of their trades (Ausubel, 1990). Besides that, Carlton & Fischel (1983) comment on the overall 'unfairness' of insider trading. They mention insider trading to allow insiders to divert a segment of the earnings of the firm, that alternatively, would be allocated to the shareholders and therewith raise the firm's cost of capital.

On the contrary however, Manne (1966) and also Carlton and Fischel (1983), advocate the acceptance of insider trading for the reason that it will increase the efficiency of the market, by improving the accuracy of the stock prices. More specifically, insider trading results in fast price discovery and results in prices more accurately reflecting the asset's worth, therewith making the market more efficient. Meulbroek (1992) analyses this theory with previously unexplored illegal insider trading data. 80% of the sample used by Meulbroek (1992) consists of insider trades, detected and prosecuted by the SEC, therewith this research solely focusses on the effect of informed illegal insider trading on the accuracy of the stock prices. Meulbroek (1992) consequently finds the abnormal price movement of insider trading to explain 40-50% of the subsequent price reaction to the announcement of the insider information, therewith Meulbroek (1992) supports the theory of Manne (1966) and Carlton and Fischel (1983), that insider trading will increase the efficiency of the market by improving the accuracy of the stock prices.

When investigating the effect of insider trading on the respective corporations, Dai et al. (2012) mention insider trading to be an agency problem between the shareholder and the manager and consequently firms on itself also introduced policies in focus of reducing and preventing the exploitation of private & non-public information by insider traders. These policies usually include a black-out period and/or counsel pre-approval requirements (Bettis, Coles & Lemmon, 1999). However, Anderson (2016) suggests that overall three activities exist for the mitigation of illegal insider trading; i) a published ban on trading any of the issuer's shares (self-policing), ii) pre-clearance and iii) black-out periods. Anderson (2016) mentions that self-policing leaves the company with these three options, all of which are ineffective. The company can adopt written policy that prevents its employees to trade on non-public information. However, this does not function as effective compliance (i.e. preventing violations, while at the same time, protecting the firm from liabilities when violations do occur), as employees do not have a clear idea of what the regulation specifically prohibits. Secondly, a firm can impose a written policy, deducing the regulation into "understandable" words and specifically identifying terms like "material", "non-public" and others. However, this strategy risks contradiction of ex post interpretations of regulators or the court. Lastly, a firm can impose a "play-it-safe" approach by banning all trading in the firm's shares by employees. However, this would eliminate equity as a form of variable pay and would therefore be highly inefficient. Following, a form of pre-clearance by compliance officers can take place. Anderson (2016) consequently mentions that compliance officers often have very limited knowledge of the employees' incentive or knowledge when trading and therefore often lead to inefficient results. Besides that, compliance officers often face a conflict of interest (e.g. working with the same people they pre-clear) and pre-clearing will decrease the value of equity compensation and increase the cost of capital (as it cannot be quickly liquidated) and thus more shares will have to be paid to have the same effect (at cost of the existing shareholders), as such, again resulting in ineffective results when mitigating illegal insider trading. Finally, companies can impose blackout periods. A blackout period is a data range where specific insiders are not allowed to trade the corporation's shares. Anderson (2016) mentions that a firm, and therewith insiders, will always have undisclosed information concerning different aspects of the business and that once that information is released publically, new undisclosed information is already present.

This leaves companies with the choice to either adopt a conservative strategy and extend the blackout period to all but a few trading windows, resulting in loss of value of equity compensation (and costs for existing shareholders), increased cost of capital and unwarranted market attention (insiders must make large trades in short time periods). Contrarily companies can adopt a very liberal blackout period and risk the company to be exposed to major liability of violation by insiders (Anderson, 2016). As explained in the section above, not only are many of these measures ineffective, they will also weigh heavy on company culture, cost of compensation, cost of capital and existing shareholders.

These corporate compliance programmes, however, serve the company twofold. To begin with, companies adopt such policies to give the idea of self-regulation, in order to reduce their regulatory and legal exposure. In this view, the policies themselves would have no economically-significant implications in the restriction of misuse of non-public information through insider trading (Bettis, Coles & Lemmon, 1999). Another view in these corporate compliance programmes is truly focussed on reducing the misuse of non-public information through insider trading from an economically-significant perspective. Logically, managers involved in illegal insider trading impose costs & sanctions to themselves, e.g. fines and jail time. However, some of the costs incurred by illegal insider trading are accounted for by the company. Extensive illegal insider trading in a company is likely to exacerbate lemon problems, resulting in a larger bid-ask spread, a higher discount rate and lower liquidity in the market for the company's shares (Bettis, Coles & Lemmon, 1999). Besides that, there are costs accounted for by the company due to the prosecuted managers in the form of lost managerial time, disruption of the business and negative publicity (Bettis, Coles & Lemmon, 1999). Important to note however, is that very few researches can link long-term company performance to illegal insider trading, due to the difficulty of finding 'illegal insider transactions' data. Other research investigated the effects on the market and investor environment, where they found a market, where insider trading is allowed to be hurtful for outside investors (i.e. shareholders), by proving, among others the 'crowding-out effect' (Leland, 1992; Fishman & Haggerty, 1992). This last notion serves as an important fundament for this research. By being involved with the same company, and stock, insiders and shareholders of the same company frequently trade with each other. As a result, insider trading will not only, due firm-specific problems (e.g. lemon problems) indirectly affect shareholders, also, by being the losers on the insiders' informed trade, will the shareholders be directly affected.

From a shareholder perspective, it is assumed that under the shareholder value maximization theory, the managers' priority is to act in the interest of the shareholders (Rappaport, 1999). However, due to the principle of separate ownership and control in companies, the value-maximization of shareholders and interests of managers do not align and consequently impose 'agency problems'. Two mechanisms are in place to resolve these agency problems namely: creating incentives for managers (e.g. stock holdings, compensation arrangements) or active monitoring by the shareholders (Jensen & Meckling, 1976), as will be further discussed in section 2.2.1 As such, in line with shareholders' value maximization, and illegal insider trading hindering this goal, one can expect shareholders to make use of one of the two mechanisms to mitigate the negative effects of illegal insider trading.

In these views, shareholders can thus restrict managers from trading in manners to maximize the value of the firm and therewith the value shareholders (Bettis, Coles & Lemmon, 1999).

2.2 – Monitoring & information asymmetry

The following section discusses two important fundamentals in this research, namely monitoring and information asymmetry.

2.2.1 - Monitoring

Jarrell & Bradley (1988) have shown that the market for corporate control does not perfectly discipline management in aligning with the interests of the shareholders. Following however is, that in the existence of opportunities, risks and managerial shirking, the belief exists the owners in some degree being able to monitor management and potentially profit from this action. As mentioned before in section 2.1.2, monitoring is one of the two mechanisms in place for shareholders to mitigate the effects of agency problems. Monitoring is defined as "a comprehensive label for all value-enhancing activities; it comprises intervention in a company's affairs as well as information acquisition (e.g. in order to identify a potential target of intervention) and is used synonymously with "intervention" and "shareholder activism"." (Maug, 1998). Monitoring essentially is a form of shareholder activism and can be broadly categorized in three concepts, namely: voting, engagement and intervention (Lynn & Mulgrew, 2008). To begin with, voting is shareholder activism that is accompanied by control rights of the acquired shares.

Depending on the policies within the company, the voting can take place by postal vote, proxy, meeting (e.g. annual general meeting) or electronic voting. Generally, shareholders would try to resolve the issues with management prior to voting. However, if no consensus is reached, voting can take place. Secondly, the concept of engagement upholds all interactions, in the form of discussions and meeting, that shareholders have with management to raise issue concerning quality of management, strategy, board structure, performance or other corporate governance issues (Stapledon, 1996). It is very common for companies to meet their most influential investors on a one-to-one (or group basis) over the course of the year, in either formal or informal settings. Finally, intervention is a method to which investors can raise issues and initiate change and improvement. The most fundamental difference of intervention engagement is on the basis of intent and sensitivity. Intervention often includes very detailed reporting about the company's poor performance and direct proposals, often in collaboration with other shareholders (Lynn & Mulgrew, 2008). Methods of monitoring which specifically apply to mitigating illegal insider trading will be discussed in section 2.2.2.

2.2.2 – Monitoring & information asymmetry

An important concept in the mitigation of effect of insider trading through monitoring is information asymmetry. Information asymmetry, occurs when one party of an economic transaction has superior informational knowledge as compared to the counterparty. Within insider trading, the party having superior informational knowledge are the corporate insiders. Corporate insiders make use of information asymmetry to acquire insider gains when trading in the company's securities. As discussed in section 2.1.2 this informational disadvantage of the non-insiders, creates the crowding-out effect, where non-insiders are crowded out and reduce investment due to information asymmetry between insiders and non-insiders (Leland, 1992; Fishman & Haggerty, 1992). Besides that, Aboody & Lev (2000) and Maug (2002) mention another effect to be in place. Due to information asymmetry to be present, and non-insiders having an informational disadvantage, insiders will consequently profit in their informed trades (Aboody & Lev, 2000) at the cost of the uninformed non-insiders (i.e. shareholders) (Maug, 2002). As such, non-insiders pose as the losers to the insiders winning trades, hereafter named Maug's loser effect. As many trading traffic exist between insiders and their shareholders, consequently Maug's loser effect is accompanied by a specific incentive for shareholders to monitor the illegality of insiders' trades.

By increased monitoring on informed (illegal) insider trading and reducing information asymmetry, shareholders minimize the possibility as posing the losers to the insider's winning trades. Elbadry, Gounopoulos & Skinner (2015) investigate the relationship between monitoring efforts and information asymmetry in securities' trading. In their research on 320 non-financial companies between the period of 2004-2010, they find that practices that increase the monitoring in the firm reduce asymmetric information. More specifically, they find that monitoring improves the market for the firm's shares by reducing stock volatility and the bid-ask spread and by increasing share trading volume. They mention that besides the value-maximizing effect for shareholders, the practice of monitoring also conveys a self-regulation signal to the market. Where companies that have superior monitoring practices will signal that they have their agency problems, instigated by information asymmetry, under control and therewith improve confidence for (future) shareholders (Eldabry, Gounopoulos & Skinner, 2015). Other research by Cormier, Ledoux, Magnan & Aerts (2009) confirms this finding. Cormier, Ledoux, Magnan & Aerts (2009) mention that best-practice governance structure, through monitoring, influence managerial discretion and results in firms more to engage in more extensive reporting and improve (voluntary) disclosure. As such, by improving (voluntary) disclosure one reduces information asymmetry. Concluding these section with the notion that monitoring, as a form of shareholder activism, is present in the existence of opportunities, risks and managerial shirking, where the shareholders in some degree can monitor management and potentially profit from this action. More specifically for illegal insider trading, one finds that increasing monitoring will reduce information asymmetry and therewith reduce the informational advantage of insiders. As such, shareholders have a strong incentive to monitor illegal insider trading, to not pose as the losers to the winning insiders' trades (Maug's loser effect).

2.3 – Ownership structure

In the following paragraph, this research assesses the concept of ownership structure. Consequently the incentives for and consequences of specific ownership structures are discussed.

2.3.1 – Capital structure

Several relevant theories have been proposed by previous research in goal of explaining differences in capital & ownership structure. To begin with, Modigliani & Miller (1958) rationalised on the idea that the choice of the capital structure is irrelevant for firm value. Modigliani & Miller (1958) mentioned the weighted average cost of capital (WACC) to be a composition of the cost of debt & equity and relative amount of debt with respect to equity (and vice versa). They further mentioned that any attempt to substitute the 'cheap' debt for the 'expensive' equity would result in the remaining equity to be more expensive, as a result of taking on more debt, herewith keeping the WACC constant (Myers, 2003). Important to note however in Modigliani & Miller's research is the assumptions to accompany this proposition. Modigliani & Miller among others assumes perfect capital markets (no information asymmetry), no taxes, no costs for financial distress, fixed investment policies and similar borrowing rates for individuals and companies.

Following the theory by Modigliani & Miller, Myers (1984) showed, when incorporating the assumptions, the capital structure to be of importance for firm value. Myers (1984) hypothesized there to be a trade-off between tax shields and agency costs. Since debt has a tax advantage one would assume companies to opt for levered capital structures. However, as noted by Myers (1984), other concepts have to be taken into account. Taking up debt as a corporation will increase the costs of financial distress. Besides that, relatively having too much debt (or equity) can result in several agency costs, such as asset substitution and empire building (Myers, 2003). Asset substitution relates to the agency problem of shareholders having more upside potential and bondholders having more downside risk, as such this creates a misalignment in incentives in investment policies. Empire building (i.e. over-investment) is an agency problem between the shareholders and managers. Because the managers are no or partial owners, the management board has incentive to grow beyond the optimal size of the firm in search of among others power, salary, bonuses and status (Jensen, 1986).

Consequently as Myers (1984) hypothesized, there will exist a 'static tradeoff' between tax shields and costs of financial distress (and agency costs). Following the static tradeoff theory, Myers & Maljuf (1984), investigated the decision of corporate financing in a market with information asymmetry and consequently proposed the pecking order theory. In this theory the rationale of acquiring finance to invest in a growth opportunity (project with a positive NPV). From the theory can be derived that, incorporating the idea of companies aligning interests with existing shareholders, companies only issue equity when the shares are overvalued (Myers & Maljuf, 1984). As the market is aware of the fact that the company acts accordingly to the interest of the existing shareholders, an equity issue results is combined with negative announcement effects (Bayless & Chaplinsky, 1996; Heron & Lie, 2004; Duca, Dutordoir, Veld & Verwijmeren, 2012). Under the pecking order theory, companies therefore prefer internal financing over debt and debt over equity issuance. Finally, a side step in theories concerning capital structure can be made, when investigating the 'market timing theory'. Graham and Harvey (2001) concluded from their research that approximately two third of the CFOs agree that "the amount by which our stock is undervalued or overvalued was an important or very important consideration". The basic idea of the market timing theory advocates that companies issue equity when prices are high and repurchase equity when prices are low. Baker & Wurgler (2002) further investigated the effect of the market timing theory on the capital structure decision of individual companies. Baker & Wurgler (2000) find that low-levered firms, tend to have raised funds when valuations were high, vice versa for high-levered firms. According to Baker & Wurgler (200) the capital structure is a cumulative outcome of past attempts to time the equity market. The market timing theory does not provide full evidence for the choice of capital structure, rather it provides additional or supporting evidence to the earlier

Concluding this chapter with the notion that capital structure can be determined by several theories, with in particular: Myers' (1984) static tradeoff theory, the pecking order theory and the market timing theory.

2.3.2 – Ownership concentration

When one investigates the determinants of ownership structure, one can identify three main categorizations in the determination of ownership structure, namely i) control potential/private benefits, ii) systematic regulation, iii) firm-specific factors and iv) industry-specific factors (Demsetz & Lehn, 1985).

Demsetz and Lehn (1985), as will be later discussed, argue that the level of ownership concentration is endogenously decided on by maximizing firm value and being restricted to risk and capital requirements. Denis & McConnell (2003) however mention the concentration of ownership to depend on the private benefits of control and in a manner be exogenously determined.

The notion that large shareholders have the incentive to effectively monitor and exercise control on management such that they increase cashflow to all shareholders is called shared benefit. The extent to which having controlling shares (common stock) has value beyond the cash flow right, is called private benefit. Several studies have investigated the hypothesis of private benefits of control and found that shares with superior voting rights, trade at a small premium compared to inferior voting shares (DeAngelo & DeAngelo, 1985; Zingales, 1995). One can attain control in excess of proportional ownership by practices such as pyramid structures or by cross-holdings. In pyramid structures, an owner at the top of the pyramid has effective control over all firms in the pyramid by small disproportionate investment in the firms lower in the pyramid through the effective control of the higher pyramid firms (51% of the shares) of the lower pyramid firms. Pyramid structures allow the tunneling of money 'up-the-pyramid' where the initial owners have a high controlling interest. Cross-holdings is the interlocking ownership of different companies in each other. In this manner, the ownership position makes members of that group incentivized to support each other and form voting coalitions. Common examples of these cross-holdings include Korea's chaebols, Japan's Keiretsus and Russia's financial-industrial groups. Denis & McConnell (2003) mention that the amount to which ownership is concentrated varies much throughout the world, with, on average, ownership being more concentrated in non-U.S. countries as opposed to U.S. countries. Dyck & Zingales (2003), in a research on ownership concentration around the world, find that the voting premiums are negatively related to the level of investor protection. Nenova (2003) consequently finds that the level of investor protection (i.e. the legal environment) explains 75% of the variation in the value of private benefits of control.

LLSV (1998) mention that investor protection laws belong to one of the following law systems: Scandinavian civil law, French civil law, German civil law and common law. Common law exerts the highest degree of investor protection and French civil law the lowest degree of investor protection. Besides that, the degree of enforcement in German and Scandinavian civil law is stronger than in common law and again, lowest in French civil law. Consequently LLSV (1998) conclude that countries having a lower degree of investor protection through law (i.e. civil law countries) have more concentrated ownership than countries that have a high degree of investor protection through law (i.e. common law countries). In other words, if the law does not protect the investors, they will protect themselves. Consequently practices like pyramid structures (accompanied with money tunneling) and cross-holding are more common in civil law countries.

McConnell (2003) also argues the legal environment to be one of the most important (exogenous) determinants of ownership structure, however other arguments at firm- / industry-level exists in determining the ownership structure. Holderness (2009) disputed the fact of country-level variation (e.g. legal environment) to be a determinant of ownership structure and argued firm- / industry-level characteristics to be of great importance. Richter & Weiss (2013) further investigate Holderness's notion. They argue, in line with Demsetz & Lehn (1985), firm size to negatively affect ownership concentration. When a firm is classified as a large firm, it has, ceteris paribus, larger capital resources and, generally, a greater market value of a given fraction of ownership. In theory, a higher price for a given fraction of ownership. (Demsetz & Lehn, 1985). A larger firm thus requires a larger investment and acquiring a significant share of a large firm will result in a suboptimal portfolio diversification, this is mentioned to be the risk-neutral effect. Furthermore, there exists a risk-averse effect; when a company with diffused ownership attempts to evolve into concentrated ownership, this implies a small group of owners to commit more wealth to the company. Based on risk aversion, the owners will only purchase shares at a low risk-compensating price (Demsetz & Lehn, 1985). This increased cost of capital, therefore, ensures large companies not committing to concentrated ownership. In conclusion, that as a firm grows in value maximizing size, the shirking costs of a diffuse ownership will be overshadowed by the risk neutral and averse effects of a larger firm. Secondly, Richter & Weiss (2013), in line with Demsetz & Lehn (1985), argue risk to have curvilinear, an inverted-U shape, relationship with ownership concentration. When a firm is more volatile (riskier), the control potential of monitoring a firm's management will be higher.

In contrary, when a firm is more volatile, ownership concentration is less attractive, as acquiring a stake will result in difficulties in holding an optimal portfolio, consequently resulting in a negative effect of risk on ownership concentration.

When investigating low-risk companies, they can conclude, that the negative effect of risk on the investor's portfolio is outweighed by the potential benefits of increased ownership concentration (Demsetz & Lehn, 1985). Richter & Weiss (2013), also test several industry-specific factors to be of great importance. To begin with, absence industry regulation, under similar assumption as the previously-discussed country's level environment, renders higher control potential and therefore results in ownership concentration. Secondly, as initially indicated by Thomsen & Pedersen (1998), information asymmetries, competition intensity, and product life cycle stage play an important role in determining ownership concentration. With respect to high information asymmetries, which are hypothesized to be present in high R&D industries, it will be more difficult to exercise control benefits and therefore lead to lower ownership concentration. Competition intensity allows shareholders to more effectively monitor the firm's performance by benchmarking them to competitor's performance, therefore leading to allow for more effective monitoring and a more dispersed ownership. Finally, Thomsen & Pedersen (1998), hypothesize ownership to be more concentrated in the entrepreneurial stage of the company, i.e. in the growth stage and be more dispersed in the later stages of the product life cycle.

Concluding this chapter with the notion that ownership concentration is determined by both control potential (private benefits), systemic regulation (legal environment), firm-specific factors (size and risk) and industry-specific factors (industry regulation, information asymmetries, competition intensity, and product life cycle stage).

2.3.3 – External ownership

According to Mintzberg (1983) there exist two prime division for the identification of ownership. Firstly, one can assess ownership on 'concentration' (and on the contrary 'dispersion'), which makes the distinction between closely – and widely held firms. Secondly, however somewhat deviating from Mintzberg (1983), one can assess ownership on 'internal' (and on the contrary 'external'), which makes the distinction between an owner that is in some manner affiliated to the company and those who are not. Consequently 4 combinations of these two divisions can be made.

The first division is thoroughly discussed in the previous section 2.3.2, in the following section this research will focus on the second prime division.

Dlugosz, Fahlenbrach, Gompers & Metrick (2006) have done intensive research into the possible combinations of division of ownership. They make use of several data inputs, as will be discussed in section 3.0, and find ownership to be divided into several categories, namely: 1) officer, (2) director, (3) affiliated entity, (4) ESOP, and (5) outside blockholder. Category 1 contains all officers, including directors and category 2 only includes non-officer director. Category 3 includes all trust, company or individual whose voting outcome is at least partially influenced by a director or officer, or any other official, in the company. Important to note here is that the voting outcome is partially influenced and not fully decided on, fully-decided-on entities would be aggregated under 1&2. Next, category 4 is an aggregate amount of shares held by the Employee Share Ownership Plans (ESOP), however not including non-ESOP retirement plans. Category 5 entails all blockholders not classified in the first 4 categories and therefore includes all blockholders that are not insiders of the company and in no manner influenced by any of the insiders in their actions, therefore labelled as 'outside blockholders'. Roughly, outside ownership can be divided in five groups namely: bank ownership, family ownership, company ownership, institutional ownership and governmental ownership (Thomson & Pedersen, 2000).

As banks provide access to financing for corporations, they exist some form of interdependence of banks with corporations' capital structure trough the determination of the cost of capital. In addition, banks, as they do with all clients they lend money, monitor firms and therewith function as an important governance mechanism for corporations. It is described by academic research that the decision to own shares and more intensively decide on the firm's actions is quick to be made by many banks (Lin, Zhang & Zhu, 2009). Family ownership usually exists in some form of controlling owners. Most families are very interconnected with a specific corporation as a result of being the founders. However, for this category (5), being outside blockholders family ownership is identified by families having no connection to the companies and therewith functioning as a very pure form of private equity. Family ownership is usually characterised by risk-averse investors, afraid to lose the family empire, however proving long-term stability (Morck & Yeung, 2003).

Corporate ownership entails a firm owning another firm. Corporate ownership can exist in the form of holding companies (i.e. a company that owns other companies' outstanding stock but does not produce himself, usually linked to a network/corporate group). However, a holding company usually is interconnected with at least one of the firms in the corporate group. Another possibility is a company owning outstanding shares of other companies in search of synergies and knowledge transition (Thomson & Pedersen, 2000). Institutional blockholders, represent (non-)financial institutions, such as banks, insurance funds, retirement funds, mutual funds, investment banks and hedge funds. Institutional ownership is usually characterised by the sole incentive of wealth creation. Institutional investors are commonly frowned upon due to their 'tunnel-vision' on wealth creation. Besides that, due to their size, they can make a huge impact on the market or the company. These investors are notorious for advising management in terms of divesting, restructuring and sell-offs, with the leverage of a proxy-fight to express their disapproval (Gillan & Starks, 2000). Government ownership logically entails (partial) ownership by the State. Usually, government ownership is characterized by the product/service by of high public interest. Government ownership is usually interdependent with politics and exercises forms of bureaucracy (Xu & Wang, 1999).

2.4 – Insider trading profitability & ownership structure

As can be concluded from the previous paragraphs, ownership structure is a significant corporate decision, interdependent on many factors. Also, as mentioned before, shareholders can monitor the firm's management in search of shareholder value maximization, which potentially can affect the profitability of insider trading. In the following sections, the relationship between capital & (external) ownership structure and insider trading is analysed and hypotheses are formed. As a reference for the coming sections, the table below summarizes all previous research on these aforementioned relationships. As further discussed in section 4.1 a distinction between sales and purchases will be made. Therewith two hypotheses per section will be created, where for CAR-sales (CAR_S) the opposite effect of CAR-purchases (CAR_P) is expected.

Research	**Measurement variable for insider trading profitability**	**Outcome**
Bajo, Bigelli, Hillier & Petracci (2009)	Compliance ratio of disclosed trades	Ownership more concentrated: less insider trading
Betzer & Theissen (2009)	CAR	Ownership concentrated: lower CAR
Fidrmuc, Goergen & Renneboog (2006)	CAR	Ownership concentrated: lower CAR
Fidrmuc, Goergen & Renneboog (2006)	CAR	Outside investors present: lower CAR
Boehmer & Kelley (2009)	Informational efficiency of prices	Institutional investors present: decreased information asymmetry
Beny (2004)	Insider trading laws' stringency	Outside ownership: more stringent insider trading laws

Table 1 - Previous research on insider trading and ownership structure

2.4.1 - Capital structure & insider trading profitability

No significant research has been performed on the relationship between insider trading and capital structure. Research however, on the relationship between shareholders and managerial disciplining and informational asymmetry, could provide interesting parallels. As mentioned before, a common agency problem and therewith corporate governance research subject is the misalignment of the shareholder-manager interest. For this reason equity holders monitor and discipline management through voting, executive selection, say-on-pay and proxies (Denis & McConnell, 2003). In line with these actions however, also debt holders benefit from management-interest alignment and also closely monitor management through covenants (Titman & Wessels, 1998). One essential difference however is the difference is pay-out policies, where equity holders receive dividend based on the manager's call and debt does not have this discretionary nature in pay-out. Besides that, in case of bankruptcy debt holders are the first in line, thereafter equity holders divide the residual (Scott, 1977). Consequently equity holders have more upside potential than bondholders and for this reason benefit more from strong long-term company performance. For this reason equity holders are more likely to monitor the legality of insider trades. Research by Gertner, Scharfstein & Stein (1994) on the cost/benefits of different capital markets mention that capital suppliers that are given residual control rights over the assets, have increased incentive to monitor. They mention that even under the assumption that both capital markets have the same ability to monitor, a capital market (i.e. equity holders) in which control rights are bought will result in increased monitoring, as opposed to capital supplier without control rights (i.e. debt holders). Also, as discussed before, through monitoring shareholders will be able to decrease informational asymmetries and reduce the profitability of insider trades. As discussed in section 2.3.1 the pecking order assumes companies to not prefer equity issuance (over debt financing) due to informational asymmetry and corresponding negative market valuation. Also, as previously discussed, increased monitoring can decrease informational asymmetries and therewith profitability of insider's trades. As a result having more equity holders (shareholders) is hypothesized to have a negative effect on abnormal returns/volumes of insider trades, which led to the following hypothesis:

H1: The debt/equity ratio exerts a positive relationship with CAR_P

H1.1: The debt/equity ratio exerts a negative relationship with CAR_S

2.4.2 – Ownership concentration & insider trading profitability

In the following section previous research on the relationship between ownership concentration (i.e. blockholders; shareholders owning more than 5% of the shares) will be investigated and fitting hypotheses will be derived. To begin with, Bajo, Bigelli, Hillier & Petracci (2009) perform research into the determinants of regulatory compliance concerning insider trading in Italian firms. They find the degree of ownership to be positively related to the degree of regulatory compliance. Bajo et al. (2009) mention the control-regulatory wedge to contain 2 relationships, namely: Type I and Type II. Type I relates to the agency relationship between management and shareholders and Type II relates to agency relationship between majority & minority shareholders. When ownership is more concentrated, managers and shareholders objectives converge and consequently Type II agency costs will dominate Type I agency costs. As such, insider trading profits are negligible as opposed to other (legal) profits such as high board remuneration, related party transactions or other practices that expropriate the minority shareholder. Contrarily, Betzer & Theissen (2009) investigate the relationship between corporate governance and insider trading profitability in German firms. They indicated that the CAARs (cumulative abnormal average returns) of trades by insiders in widely held firms are larger than CAARs of trades by insiders in firms with a dominant shareholder. In line with this result they mention that larger shareholders have stronger incentives to monitor management and thus give corporate insiders have less possibility to maximize their own utility. Also, they mention this result to be consistent with the notion that firms with concentrated ownership to have less informational asymmetries between them and the capital market, as compared to firms with dispersed ownership. Following, Fidrmuc, Goergen & Renneboog (2006) investigate the effect of (external) ownership concentration on a director's purchases/sales announcement effect. They hypothesize that the director's trades convey new information and therewith result in abnormal returns. Given that the monitoring activities of large shareholders, benefit all shareholders, the information asymmetry between shareholders and management is reduced. As a result, the director's dealings contain a less important signal of private information and therewith result in lower abnormal returns. They consequently find a strong negative relationship between ownership concentration and cumulative abnormal returns after director's trades. Research by Hirschey & Zaima (1989) find similar results concerning the reaction of the market.

Finally, research by Shleifer & Vischy (1986) and Grossman & Hart (1980) also mention that larger shareholders, by owning more shares have a larger incentive to monitor management and, if necessary, intervene. On the practical side, larger shareholders have a larger vote on shareholder meetings and due to their size and importance of decision, impose a larger threat on management (Urban, 2015). This section concludes that larger shareholders align managers' decision in line with shareholder value maximization. Based on these researches one might consequently expect shareholders owning at least 5% of the shares (i.e. blockholders) to exert a negative relationship with CAR, as 'illegal' insider trading (as mentioned before) is not in line with shareholder value maximization and blockholders consequently have more to lose. This led to the second hypothesis:

H2: The presence of blockholder(s) exerts a negative relationship with CAR_P

H2.1: The presence of blockholder(s) exerts a positive relationship with CAR_S

2.4.3 – External ownership & insider trading profitability

In the following section, the relationship between external (vs internal) ownership and insider trading profitability will be examined and fitting hypotheses will be formed. Research by Fidrmuc, Goergan & Renneboog (2006) on the abnormal returns of trades by executives of a firm, find that abnormal returns are lower when the firm is controlled by outside blockholders that are likely to monitor management blockholders than firms that are controlled by inside blockholders that are unlikely to monitor management. In line with these findings, other research confirms the idea that outside shareholders closely monitor management (Kahn & Winton, 1998; Bloch & Hege, 2001; Noe, 2002). Other interesting research by Boehmer & Kelley (2009) investigates the relationship between institutional stock holdings and informational price efficiency. Making use of a panel of NYSE-listed stocks, they find that the presence of institutional investors results in increased informational efficiency. As mentioned before, one critical factor in insider trading is information asymmetry. Information asymmetry allows the insiders to profit from the outsiders and therefore is unwanted by outside investors, such as institutional investors. Consequently a reference must be made to section 2.2.2, discussing the impact of insider trading. As mentioned in that section, the winner of insider trading, i.e. the informed insiders, will gain by indirectly expropriating the losers of insider trading, i.e. the uninformed outsiders (Maug, 2002). Beny (2004) reinforces this idea with the investigated positive relationship between insider trading law and enforcement and outside ownership and as such decrease abnormal returns. Also, as mentioned before, there exists much trading traffic between the insiders and outsiders of a company and therefore outsiders will pose as the insider trading's losers. As outside ownership usually already is identified by an informational disadvantage, these investors will more actively monitor (Choi, Lam, Sami & Zhou, 2011). As such, one might expect companies dominated with outside shareholders to more closely monitor the managers on the legality of insider trading, as such this led to the following hypothesis:

H3: The presence of outside blockholders exerts a negative relationship with CAR_P
H3.1: The presence of outside blockholders exerts a positive relationship with CAR_S

3.0 – Data

This research makes use of 5 datasets, namely: 1) the Thomson Financial Data Insiders Feed, 2) Eventus/CRSP, 3) the Blockholder database by Dlugosz, Fahlenbrach, Gompers & Metrick (2006), 4) Shareholder protection database by Bebchuk et al. (2009) and 5) Compustat. All database can be accessed through the Wharton Research Data Services.

As mentioned in section 2.1.1., under Section 16(a) of the SEA, all corporate insiders (i.e. directors, corporate officers and inside blockholders holding at least 5% of the shares) are required to report their trades to the SEC. These data become a matter of public information and through the reporting serve as a regulatory principle in insider trading. Since 1984, the SEC began to electronically collect this data making use of the SEC EDGAR, where these statements are publically disclosed. Investors can make use of Form Fillings to disclose their trades (form 3, 4, 5 & 144). Form 3 is required to be filed when the company of the insider is registering the equity for the first time. When the equity is registered under Section 12 of the Securities Exchange Act, the insider must file this form within 10 days of becoming a director, beneficial owner or an officer. Form 4 represent changes in ownership of registered equity, which must be reported within two business days. Form 5 entails all insider transactions that should have been filed earlier under form 4 or, however, for some reason, were permitted for deferred reporting. Form 5 must be filed 45 days after the end of the company's fiscal year, latest (SEC, 2013). Thomson Reuters collects data on these transactions in their Thomson Financial Data Insiders Feed (TFDIF). Thomson's Table 1 TFDIF database represents all non-derivative transactions and holdings information as filed by insiders under form 3, 4 & 5. This research will focus on non-derivative (i.e. conventional) stock transactions instead of derivate transactions. Following other research on insider trading (Seyhun, 1986; Huddart & Ke, 2007) this research will exclude the TFDIF derivative database (Table 2) and stock options are therefore excluded from the database. Stock options entail the right to sell or buy at a specific price, within a set period of time. The award of stock options not fully related to the discretion of the insiders, but more to those who award the stock option and therefore do not directly represent the informativeness of the insider trade.

In addition, following the research of Lakonishok and Lee (2001), transactions with less than 100 shares are excluded from the database to have the transactions to center around meaningful events. Following, financial services companies are excluded from the sample based on their Standard Industry classification (6000-6999) as these companies' financial data concerning leverage does not have the same meaning as non-financial firms (Gray & Vogel, 2013). From this created database the transaction date by company identifier will be extracted.

Secondly, the Center for Research in Security Prices (CRSP) is used to identify profitability of the insider trade by investigating the stock price. The CRSP maintains the most comprehensive and extensive database on security return, price & volume of securities traded on NYSE, AMEX and NASDAQ stock markets. CRSP contains daily return and price data on securities traded on these stock markets and therewith covers all S&P 500 companies and companies represented in the database by Dlugosz, Fahlenbrach, Gompers & Metrick (2006). Consequently the WRDS Eventus database allows for event studies and is directly linked to CRSP. Following one can create, using the return from CRSP and the event study tool from Eventus, the cumulative average abnormal returns (CAR) for different insider trades. The methodology and operationalization of this variable will be further assessed in section 4.1.

Thirdly, the Blockholder database by Dlugosz, Fahlenbrach, Gompers & Metrick (2006) is used to identify the independent variable of ownership. As mentioned before in section 2.3, this research aims at identifying the concept of ownership concentration (dispersed vs concentrated ownership) and the concept of outside ownership (internal vs external ownership). As mentioned in their research, the research Dlugosz et al. (2006) arose with the notion that no standardized database concerning ownership concentration exists, though it is a fundamental shackle in many researches. In their research, they show that many databases to be used for the identification of ownership concentration usually result in heavy biases. The most common database alternatively used for ownership structure research is usually based on proxy filings. As mentioned by Dlugosz et al. (2006) however, proxy filings in some cases ignore information on cross or joint ownership. Dlugosz et al. (2006) make use of several databases (the Investor Responsibility Research Center and Livedgar) and manually cleanse and revalidate the data. Consequently Dlugosz et al. (2006) provide a standardized and cleansed database for ownership concentration and outside ownership.

Their database includes 1,913 companies over a data period of 1996-2001 and therewith covers 90% of the value of the major stock markets (Dlugosz & et al., 2006). This database is therefore considered to be the most extensive, complete and accurate database on ownership structure.

Furthermore, this research makes use of the database of Bebchuk et al. (2009) to identify the control variable for shareholder protection. Finally, Standard & Poor's Compustat database is used to identify several control variables. This database monitors specific companies over the years, with the earliest information dating back to 1962. Compustat covers over 88.000 global securities and 56.000 companies globally (Standard & Poor's, 2017). The Compustat database allows for the identification of many different variables over many different companies. The Compustat database is, therefore, an effective database in identifying basic financial information of S&P 500 companies, to be used as control variables. Finally, in order to avoid outliers, all data will be winsorized at 1% and 99 % level.

4. 0 - Methodology

4.1 – Profitability of insider trades

As mentioned before, it is very difficult to indicate illegality. Therefore, this research will focus on the profitability (i.e. informativeness) of the insider trades. An insider's specific amount of non-public information, when entering a trade, cannot be observed. However, profitability serves as a strong proxy for the informational advantage (i.e information asymmetry). As can be seen in Figure 1, this research hypothesizes illegal insider trading to create an informational (dis)advantage for (shareholders) insiders. Consequently based on information asymmetry & Maug's loser effect, profitable insider trades are made, as measured by abnormal returns, by the insiders. Shareholders, on different intensities by ownership structure, initiate monitoring and by improved information disclosure reduce information asymmetry. As such, if a reduction in information asymmetry is possible, illegal insider trading can expected to be mitigated.

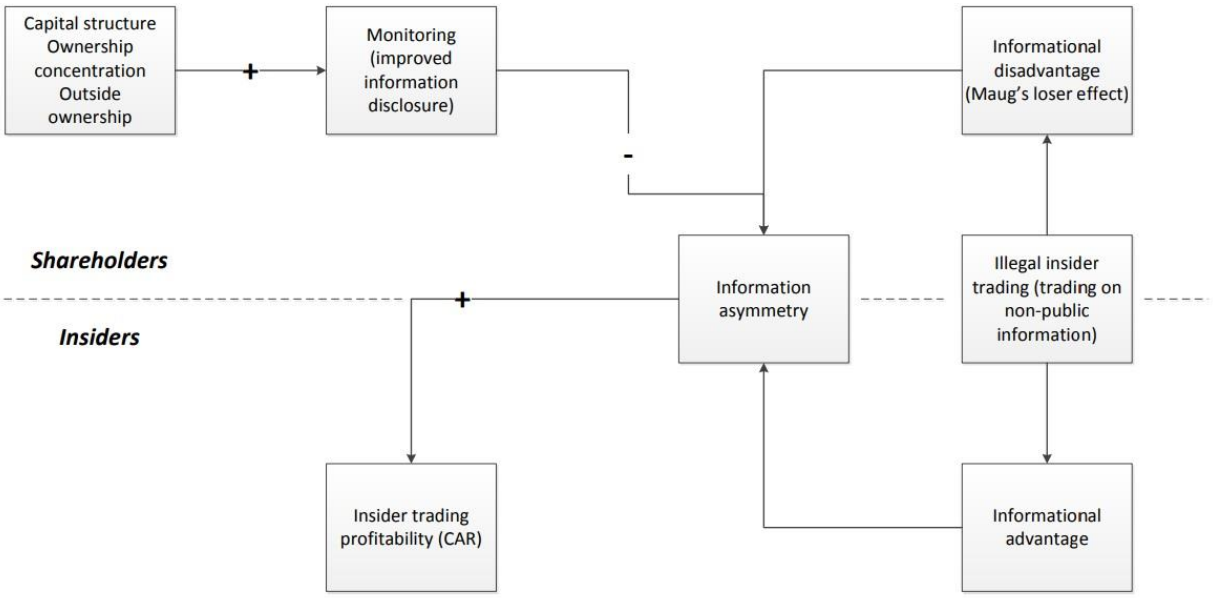

Figure 1 - Theoretical foundation

Commonly the average return over the market return indicates the 'abnormal' returns of the trade. In line with previous research, the cumulative average abnormal returns (CAR) will be used to investigate the profitability and therewith the informational advantage of insider trading. CAR is a measure designed to identify long-term returns (Fama, 1998) and is commonly used in insider trading research (Meulbroek, 1992; Nasser & Agrawal, 2012; Jeng, Metrick, & Zeckhauser, 2006). In line with research by Nasser & Agrawal (2012), firstly the abnormal returns (AR) should be identified, which is calculated as follows:

$$AR_{it} = r_{it} - r_{mt}$$

Where r_i is defined as the stock return for firm i on day t and r_m is defined as the stock return for the market, which is the equal-weighted CRSP (i.e. NYSE, NASDAQ or AMEX) index. One should expect the stock price to follow a random walk model the period before the trade is made. However if insider trades are informative on average, the stock price should result in abnormal returns from the period the trade is made. By controlling for several effects, expected to have an effect on cumulative abnormal returns for legal trades (and increasing R-squared), one comes closer to explaining variation caused by illegal insider trading.

This research makes use of a six-month (180 days) period to calculate the abnormal returns over the market returns after the transaction date. As mentioned before in section 2.1.1, the "short-swing rule" as mentioned in section 16b of the Securities and Exchange Act, forces insider to hand over any profit made from round-chip trades (i.e. purchase made after a sale, or vice-versa) to the company, made within a six-month period. Therefore, a six-month period is the shortest plausible time horizon for an insider to trade. Besides that, as mentioned by Huddart (2007), calculating the abnormal returns over a period longer than six months will allow for the entrance of noise in the used variable. Seyhun (1998) confirms this idea with the conclusion that the price drift is largest right after the transaction date and decrease from 9-12 months after the trade.

This study will investigate the most recent year from the blockholder database (2001) and as the CARs are calculated over a 6-month period; for the insider trade to take place in 2001 the transaction date must be before the end of July.

Therefore, insider trading data from Jan-2001 to Jul-2001 is taken into account. The year 2001 is taken as this is the most recent year of the blockholder database and thereafter no extensive data on ownership structure exists. This research considers 2001 to be an appropriate year as the most fundamental regulations surrounding insider trading, i.e. mandatory SEC-disclosure and the "short-swing rule", are still in place and the Supreme Court still refers to the Securities and Exchange Act of 1934 when convicting illegality in insider trading (ProCon, 2013). Besides that, though several researches prove the contrary (Durnev & Nain, 2007; Frijns, Gilbert, & Tourani-Rad, 2008; Dutordoir, Verwijmeren, Wu, & Vegenas-Nanos, 2018) also a large body of literature concludes regulation to have (had) no effect on insider trading intensity and profitability (Jaffe, 1974; Seyhun, 1992; Bris, 2005; Jagolinzer, 2009) and therefore the use of 2001 is justified.

In conclusion, this research will investigate the CAR 0-180 subsequent to the transaction date, with the transaction date being t=0. Consequently the CAR is calculated as follows.

$$CAR_{it} = \sum_{t=0}^{t=180} AR_{it}$$

The Eventus (Cowan Research LLC) event-study software, available through WRDS, is used to obtain the CARs. In order to acquire these variables the, the Daily Cross-Sectional Analysis-Daily is used. This option allows for the calculation of the CAR (Cross-Sectional Analysis) based on daily prices of specific companies around specific dates (transaction date). Finally, Eventus requires the companies to be able to identify from each other, therefore this research makes use of a CUSIP code. A CUSIP (Committee on Uniform Security Identification Procedures) code is a nine-digit, alphanumeric unique code that makes it able to identify companies.

Following the identification of the CARs of the different trades per company (CUSIP) a separation of sales (S) and purchases (P) are made. As discussed in section 2.3 the expected effect of ownership structure on insider trading profitability is different with a purchase/sale.
After the identification of purchases and sales, the different companies are linked to the Compustat, Blockholder and Bebchuk et al. (2009) database and the datasets are merged through STATA. The merging of the different datasets led to the following total observations and unique firm observations.

Fully covered by	**Unique firms (P)**	**Unique firms (S)**	**Observations (P)**	**Observations (S)**
Blockholder database	1913	1913	1913	1913
Blockholder+TFDIF	190	381	828	9249
Blockholder+TFDIF+Compustat	187	376	822	9180
Blockholder+TFDIF+Compustat +Bebchuk	187	376	763	8977
Blockholder+TFDIF+Compustat +Bebchuk +CRSP	187	376	763	8977

Table 2 - Total observations and unique firm observations

4.2 – Ownership structure

Consequently this research creates, the independent variable, ownership structure. As mentioned before in section 2.3, this research wants to identify three concepts of ownership structure. To begin with, for hypothesis 1, this research investigates the effect of increased equity (relative to debt) on the profitability of insider trading. In order to identify this relationship, this research uses the debt/equity ratio. The debt/equity ratio will be extracted from the Compustat database. Here one can identify the different levels of total debt and total equity per company identifier (CUSIP), per year. Consequently the debt/equity ratio will be calculated by dividing the total debt by the total (book value of) equity in the given year for a specific CUSIP.
Secondly, this research aims to investigate the effect of concentrated vs dispersed ownership on the profitability of insider trades.

Dlugosz et al. (2006), in their database, identified two variables of interest for hypothesis 2, namely: "Percentage held by all blockholders for that firm-year" & "Number of all blockholders for that firm-year". Dlugosz et al. (2006) identified a blockholder to be an entity owning at least 5% of the shares.

Consequently they identified the cumulative number of blockholders and the cumulative percentage of shares held by all blockholders. Important here to note is that when assessing the cumulative number of blockholders one does not know the percentage of shares held by the number of blockholder, thus for one company the cumulative number of blockholders can be higher, though the actual cumulative amount of shares are held is lower, as compared to another company. For this reason, both these variables will be first entered as separate variables in the regression, where after an interaction term between the number of blockholders & percentage of shares held is created (number of blockholders * percentage of shares held). As such, the effect of larger (than 5%) blockholders can be assessed.

Finally, the effect of external vs internal ownership on profitability of insider trades is investigated. Dlugosz et al. (2006), in their databases, provide the following variables, namely: "Percentage held by all outside blockholders" and "Number of outside blockholders". As discussed in section 2.3.2, as derived from the research of Dlugosz et al. (2006), a five classification of ownership exist: 1) officer, (2) director, (3) affiliated entity, (4) ESOP, and (5) outside blockholder. Classification 5 therefore represent external concentrated ownership (i.e. outside blockholders) and serves as a variable for hypothesis 3. To begin with, both variables will be again entered in the regression as separate continuous variables. Similarly as hypothesis 2, the significance of external ownership cannot be fully derived by investigating these variables separately. Therefore, similarly as hypothesis 2, these variables will also be entered as an interaction variable (number of outside blockholders * percentage held of outside blockholders).

4.3 – Control variables

In the following section, the control variables that will be used in this research will be discussed. Control variables will be entered in the regressions in order to control for any confounding effects in the relationship between the independent and dependent variable and have the potential to affect internal validity.

To begin with, this research includes firm size as a control variable. Naturally, firm size has a very direct relationship with insider trading, where larger firms employ more people and therewith contain more insiders that could potentially engage in insider trading. Besides that, one can conclude larger firms (as measured by market capitalization) to have increased analyst following, due to the potential of profitable opportunities and large & many market transactions (Ritholtz, 2014). Also, research by Piotroski & Roulstone (2004) and Chan & Hameed (2006) indicate that larger analyst following results in lower stock price informativeness by insiders, therewith reducing the informational advantage of informed insiders. Firm size also has an effect on ownership structure. As mentioned before in section 2.3.2 by Demsetz & Lehn (1985), firm size negatively affects ownership concentration. This is mentioned to be the risk-neutral effect and originates in the idea that larger firms require a larger investment to acquire a significant share of the firm and can potentially result in a suboptimal portfolio diversification. This concept will also have a similar effect on ownership structure and external ownership and therefore also be controlled for in those regressions. In line with other research including firm size as a control variable, firm size will be entered as the natural logarithm of assets (Orlitzky, Schmidt & Rynes, 2003).

Secondly, the market-to-book value of equity will be entered as a control variable. Many researches use the market-to-book value of equity as a proxy for information asymmetry (Gruninger & Hirschvogl, 2008). Clarke & Shastri (2000) mention the information asymmetry in the capital market to be based on the set of growth opportunities of a firm. A high market-to-book ratio entails a high set of growth opportunities of a firm as compared to the current asset value. As such, a high market-to-book ratio entails high information asymmetry between the insiders and investor, therewith increasing the informational advantage of the insider. Byun, Hwang & Lee (2011) investigate the effect of ownership concentration on information asymmetry among equity investor. They find that ownership concentration is positively related with information asymmetry. As they mention; a concentrated ownership structure to exhibit a greater disparity between control and cash flow rights and therefore enable controlling shareholders to divert firm resources at the expense of minority shareholders, by among others disclosing less firm-specific information about management opportunistic behaviour (Byun, Hwang, & Lee, 2011).

Besides that, as mentioned by Myers (1984), information asymmetry results in companies making different choices concerning their debt issuance. Also, external ownership is influenced by information asymmetry, as outside ownership usually already is identified by an informational disadvantage and outside investors are therefore drawn to companies with transparent disclosure and low information asymmetry (Choi, Lam, Sami & Zhou, 2011).

Thirdly, the return-on-assets ratio (ROA) will be entered as a control variable in the regressions as a proxy for profitability. Profitable firms will on itself result in an increased stock return and therefore profitability will be entered as a control variable due to the potential of being a strong confounder. Besides that, as discussed in earlier sections, there exist extensive research on the relationship between ownership structure and firm performance. Depending on the theory that one might cite, there could exist a static tradeoff between tax shields and costs of financial distress (and agency costs) and therewith a strong relationship between profitability (firm value) and ownership structure. This theory will also affect ownership concentration and external ownership and therefore also be controlled for in those regressions.

Besides that, in all regression industry fixed effects (based on SIC codes) will be entered to control for industry difference, as some industries impose different or more stringent regulation around insider trading and ownership concentration/structure. The Standard Industry Classification (SIC) code represents a hierarchical 4-digit number that signifies the industry in which the company is active. The first two digits represent the major industry to which the firm belongs, the third and fourth digits represent the sub-industries and specialization to which the firm belongs. Consequently common practice is to create dummy variables based on the first two digits of the SIC code and as such include industry fixed effects in the regressions (Ph.D. in Finance, 2016).

Finally, all regressions are tested on their robustness of significance and sign by adding several other control variables to the regressions. As such, the following control variables will be entered to test for robustness: Tobin's Q, number of officer blockholders and E-index. Tobin's Q is entered in the regressions to serve as another proxy for firm performance and the number of officer blockholders serves to control for differences in officer shareholder presence and therewith increased insider trading and different ownership concentration. The E-index is a measure developed by Bebchuk et al. (2009) which identifies the level of shareholder protection.

Bebchuk et al. (2009) extended on the GIM-index by Gompers, Ishii and Metrick (2003) making use of 24 governance provision that are deemed in contrary to the interest of the shareholders. Bebchuk et al. (2009) re-examined the importance of these 24 provisions and identified 6 provisions that are most important, which consequently form the E-index, namely: poison pills, golden parachutes, staggered boards, limits to shareholder bylaws and supermajority requirements for mergers and charter amendments. As such, a higher E-index signifies a weaker shareholder protection and weak internal governance (Bebchuk, Cohen & Ferrell, 2009). As mentioned before in section 2.1.2, due to information asymmetry, insiders have the ability to profit from shareholder by making them the losers on their informed winning trades. Strong internal governance and therewith shareholder protection has the ability to prevent such practices. As such, the regressions will be controlled for this effect.

4.4 – Variable overview

In the following section the variable operationalization, data sources and descriptions for the different concepts used are presented.

Concept	Variable	Operationalization	Database	Description
Profitability of insider trades	CAR	*see section 4.1	TFDIF & Eventus/CRSP	*The cumulative abnormal returns (as respective to the market return), by CUSIP, over a period of 180 days after the transaction date*
Capital structure	DE_ratio	Total debt/Total Book Value of Equity	Compustat	*The total book value of equity as relative to the total debt, by CUSIP*
Ownership concentration	OC_1	Number of blockholders	Dlugosz et al. (2006)	*The cumulative number of investors that hold at least 5% of the shares, by CUSIP*
	OC_2	Percentage held by blockholders	Dlugosz et al. (2006)	*The cumulative percentage of shares held by investors that hold at least 5% of the shares, by CUSIP*
	OC_3	(OC_1*OC _2)	Dlugosz et al. (2006)	*An interaction variable between OC_1 and OC_2*
External ownership	EO_1	Number of outside blockholders	Dlugosz et al. (2006)	*The cumulative number of outside investors (classification 5) that hold at least 5% of the shares, by CUSIP*
	EO_2	Percentage held by outside blockholders	Dlugosz et al. (2006)	*The cumulative percentage of shares held by outside investors (classification 5) that hold at least 5% of the shares, by CUSIP*
	EO_3	(EO_1*EO_2)	Dlugosz et al. (2006)	*An interaction variable between EO_1 and EO_2*

Control variables	LN(Size)	LN(total assets)	Compustat	*The natural logarithm of total assets to serve as a control for firm size*
	LN(MB_ratio)	LN(Market value equity / Book value equity)	Compustat	*The ratio of the market value to book value of equity to serve as a control for information asymmetry*
	ROA	Net income / Total assets	Compustat	*The return-on-assets to serve as a control for profitability*
	Number_officers	Number of officer blockholders	Dlugosz et al. (2006)	*The cumulative number of officer investors that hold at least 5% of the shares, by CUSIP*
	LN(TQ)	LN(Market value / Total asset value)	Compustat	*Tobin's Q serves as a control for profitability*
	E-Index	E-Index	Bebchuk et al. et al. (2009)	*E-Index servers as a control for shareholder protection and is based on provisions deemed contrary to the interest of the shareholders*
	SIC	SIC code	Compustat	*Standard Industry Classification (SIC) code to allow for industry fixed effects*

4.5 – Models

Finally, the CAR will be regressed in STATA against the ownership variables, including control variables. Consequently the following models will be created:

Model A_I – capital structure

$$CAR_{S,P} = \beta 0 + \beta 1 * DE_{ratio} + \beta 2 * LN(Size) + \beta 3 * LN(MB_{ratio}) + \beta 4 * ROA + (industry\ fixed\ effects) + \epsilon$$

Model $B_{I,\ II,\ III}$ – ownership concentration

$$CAR_{S,P} = \beta 0 + \beta 1 * OC_{1,2,3} + \beta 2 * LN(Size) + \beta 3 * LN(MB_{ratio}) + \beta 4 * ROA + (industry\ fixed\ effects) + \epsilon$$

Model $C_{I,\ II,\ III}$ – external ownership

$$CAR_{S,P} = \beta 0 + \beta 1 * EO_{1,2,3} + \beta 2 * LN(Size) + \beta 3 * LN(MB_{ratio}) + \beta 4 * ROA + (industry\ fixed\ effects) + \epsilon$$

In model III, where the interaction term is entered, all of the original effects from model I & II are entered in the regression in order to accurately assess the effect of the interaction term.

Besides that, in order to test for robustness in these regressions, all regressions will also be regressed include the three other control variables number of officer blockholders, Tobin's Q and E-Index (Models Aa, Ba & Ca).

Model A_{Ia} – capital structure

$$CAR_{S,P} = \beta 0 + \beta 1 * DE_{ratio} + \beta 2 * LN(Size) + \beta 3 * LN(MB_{ratio}) + \beta 4 * ROA + \beta 5 * Number_{Officers} + \beta 6 * LN(TQ) + \beta 7 * E - Index + (industry\ fixed\ effects) + \epsilon$$

Model $B_{Ia,\ IIa,\ IIIa}$ – ownership concentration

$$CAR_{S,P} = \beta 0 + \beta 1 * OC_{1,2,3} + \beta 2 * LN(Size) + \beta 3 * LN(MB_{ratio}) + \beta 4 * ROA + \beta 5 * Number_{Officers} + \beta 6 * LN(TQ) + \beta 7 * E - Index + (industry\ fixed\ effects) + \epsilon$$

Model $C_{Ia,\ IIa,\ IIIa}$ – external ownership

$$CAR_{S,P} = \beta 0 + \beta 1 * EO_{1,2,3} + \beta 2 * LN(Size) + \beta 3 * LN(MB_{ratio}) + \beta 4 * ROA + \beta 5 * Number_{Officers} + \beta 6 * LN(TQ) + \beta 7 * E - Index + (industry\ fixed\ effects) + \epsilon$$

Finally, this research will revalidate the effect of any of the ownership variables when controlled for the others, for this reason all three ownership variables will be entered to find which one remains significant, when controlling for the effects of debt-to-equity ratio, ownership concentration and external ownership.

Model D – all ownership effects

$$CAR_{S,P} = \beta 0 + \beta 1 * DE\_ratio + \beta 2 * OC_1 + \beta 3 * EO_1 + \beta 4 * LN(Size) + \beta 5 * LN(MB_{ratio}) + \beta 6 * ROA + \beta 7 * Number_{Officers} + \beta 8 * LN(TQ) + \beta 9 * E - Index + (industry\ fixed\ effects) + \epsilon$$

5.0 - Results

In the following section the results of all empirical analysis, as presented in section 4.5, are presented. To begin with, descriptive statistics are presented and robustness tests are performed. Consequently the three hypotheses of ownership structure, ownership concentration and external ownership will be tested in section 5.3, 5.4 & 5.5 respectively. Finally all ownership effects will be entered together in section 5.6.

5.1 – Descriptive analytics

In the following section, the descriptive statistics of the data will be discussed, as presented in Table 3.

As one can see, from Table 3, the CAR_P has a value of 0.1861 and CAR_S a value of -0.3745. This value entails that the stock that is being traded experiences an overperformance to the expected returns (the market return) of 0.19% for all insider purchases made and an underperformance of 0.38% for all insider sales made, measured over the subsequent 180 days. As such, purchasing a stock that infers a positive CAR over time as well as selling a stock that infers a negative CAR over time results in profitable trades. When comparing these CARs to other researches, similar results are found. Seyhun (1986), Fidrmuc et al. (2006) and Betzer & Theissen (2007), similarly making use of the transaction date as event period zero and somewhat similar time period, all find a positive CAR_P (in the magnitude of 0.13% - 5.84%) and a negative CAR_S (in the magnitude of -3.67%- -0.12%). When further investigating Table 3 including the original data, one can identify that the variable size for both sale and purchase has a spread of approximately 4 to 10, with a mean of around 7. As size is transformed using a natural logarithm this entails that size is distributed within 77 million USD to 500 billion USD, with a mean around 1.2 billion USD. IRS makes a distinction between small and large companies by the threshold of 10 million USD in assets (IRS, 2018). From this can be concluded that most companies in the sample represent relatively large enterprises, which can be derived from the fact that the companies are represented in the S&P 500, which represents the 500 largest companies (by market capitalization) on the common stock exchanges.

Furthermore, while investigating Table 3, one can see a mean of the market-to-book ratio of 0.91 for purchase and 1.69 for sale. As this variable is transformed making use of a natural logarithm this entails a mean of 2.5 for purchases and 5.4 for sales. The average market-to-book ratio of the S&P 500 for the first 6 months of 2001 is 3.64 fairly representing the market-to-book ratio of the datasets (Multpl, 2018).

Purchase	N	Mean	St. dev	p25	p75
CAR_P (%)	795	0.1861	0.8353	-0.2012	0.4513
LN(Size)	795	6.9996	1.7650	5.6358	8.2575
LN(MB_ratio)	795	0.9137	1.4623	0.0903	1.5578
ROA	763	0.0242	0.1310	-0.0099	0.0794
LN(TQ)	795	0.1088	1.5488	-0.7096	1.2396
Number_officer	795	0.2642	0.5572	0	0
E_Index	795	2.1572	1.1264	1	3
DE_ratio	795	1.3735	3.2775	0.1459	1.3478
OC_1	795	3.0704	1.9509	2	5
OC_2 (%)	795	29.5281	20.4409	14.71	46.5
OC_3	795	124.3041	125.4072	27.6	217
EO_1	795	2.2541	1.6709	1	3
EO_2 (%)	795	21.2460	17.2985	6.3	30.5
EO_3	795	71.4205	91.428	6.3	94.68
Sale					
CAR_S (%)	9011	-0.3745	0.5463	-0.6557	0.0055
LN(Size)	9011	7.2346	1.3062	6.3936	7.9829
LN(MB_ratio)	9005	1.6874	1.8328	0.3068	2.8450
ROA	8983	0.0567	0.0971	0.0231	0.1056
LN(TQ)	9011	0.9303	1.8722	-0.4120	2.0316
Number_officer	9011	0.3280	0.5230	0	1
E_Index	9011	1.8710	1.4326	1	3
DE_ratio	9011	0.8229	2.0084	0.0085	0.8413
OC_1	9011	2.4026	1.6062	1	3
OC_2 (%)	9011	24.7595	17.4058	12.3	33.7
OC_3	9011	82.0045	96.1660	12.3	120
EO_1	9011	1.6925	1.5095	1	3
EO_2 (%)	9011	15.5645	15.8088	5	23.76
EO_3	9011	47.4707	75.6890	5	56.94

Table 3 - Descriptive statistics Purchase & Sale

Consequently when investigating the return-on-assets of the datasets, one can see the ROAs to be distributed within –0.01 to 0.11, with a mean of 0.02 for purchases and 0.06 for sales. The range over which ROA is distributed for non-financial industries, ranges from 0.004 to 0.1 on average, concluding that our sample data is fairly within range (CSI Market, 2018). Taking into account that also Tobin's Q is transformed using a natural logarithm one can identify Tobin's Q for purchases to equal 1.2 and 2.5 for sales. The mean Tobin's Q for S&P 500 in 2001 was 1.6, again fairly representing our sample data (AdvisorPerspectives, 2018). Furthermore, one can identify that on average firms in the purchasing dataset have 0.26 officer blockholders and 0.33 officer blockholders for sales. Also, one can see that the E-index is on average 2.16 for purchases and 0.82 for sales, representing slightly better (internally) governed firms. When further investigating Table 3, one can identify the debt-to-equity ratio to have a mean around of 0.82 for sales and 1.38 for purchases. As such, can be concluded that this research's data on average accurately represent the population, as the debt-to-equity ratio of non-financial industries are on average distributed within 0.50 to 1.50 (CSI Market, 2018). By assessing Table 3, one can also identify that on average the firms have 3 blockholders, owning 25-30% of the shares and 2 outside blockholders owning 15-22% of the company's total shares.

5.2 – BLUE assumption testing

In the coming section, the data will be checked for the assumptions of a BLUE (best-linear-unbiased-estimator) regressions. The assumptions that as such will be checked are: normality, heteroskedasticity, autocorrelation and multicollinearity.

5.2.1 – Normality

To begin with all variables this research investigates if the data is normally distributed, i.e. the residuals are normally distributed. Each of the variables is checked making use of a skewness-kurtosis histogram and consequently investigated if the residuals conform to normality. As a result, this research finds 'total assets', 'market-to-book ratio' and 'Tobin's Q' to not conform to normality and these variables are transformed making use of a natural logarithm ((LN(total assets), LN(MB_ratio) and LN(TQ)) to better conform to normality, in line with research by (Orlitzky, Schmidt & Rynes, 2003) and (Anderson & Reeb, 2003). When assessing the overall normality of the different regressions, one can conclude the following; under the central limit theorem, one can assume a sample to autonomously imitate normality starting from 30 observations. Besides that, several researches into the required subjects per variable (SPV) indicated a range of 2-20 in order to result in unbiased results (Austin & Steyerberg, 2015). As this research's lowest regression has 763 observations (subjects) and the maximum amount of variables is 4, this requirement for normality is most likely satisfied.

5.2.2 – Heteroskedasticity

Secondly, this research will assess for heteroskedasticity. Heteroskedasticity indicates that the variance of the residual error term, varies significantly across a range of values (Field, 2015). In order to check for heteroskedasticity, this research will make use of the Breusch-Pagan test; a test that asserts heteroskedasticity and tests for the null-hypothesis of no heteroskedasticity. As can be seen in Table 4, all regressions contain a form of heteroskedasticity. Important to note here however, is the fact that heteroskedasticity does not imply the multivariate linear regression coefficients to be biased. Heteroskedasticity only results in the multivariate linear regression estimates of the variance to be biased. As such, regressions containing heteroskedasticity have the ability to affect the power of the test, however, will result in unbiased estimates in the relationship between the outcome and predictor variable (Field, 2015). A common manner to deal with heteroskedasticity is to make use of robust standard errors, also named Huber-White standard errors. Making use of robust standard errors estimations will correct for heteroskedasticity in the regression and will result in unbiased estimates.

Model	Breusch-Pagan test P-value (P,S)
A	0.0001***, 0.0000***
B	0.0002***, 0.0000***
C	0.0004***, 0.0000***
D	0.0000***, 0.0000***

Table 4 - Breusch-Pagan Test

5.2.3 – Autocorrelation

In the following section, the problem of autocorrelation will be assessed. Autocorrelation, also known as serial correlation, indicates the concept of variables' relatedness over a given interval and therewith the relationship of a variables' current value and past value (Field, 2015). This given interval in most cases is indicated by time. As this is a cross-sectional research, where the data-analysis is performed in 1 year, no specific test can be performed and therewith can be assumed that autocorrelation is not present in the sample data.

5.2.4 - Multicollinearity

Finally, the data will be checked for multicollinearity. Multicollinearity indicates the issue of 2+ predictor variables in a multivariate regression analysis being highly correlated to each other. Important to note however, is that also multicollinearity does not bias the estimates, merely affects the power of the test (Field, 2015). In order to test for multicollinearity, this research will make use of the variance-inflation-factor (VIF) test. This test results in a number indicating the level of multicollinearity between two variables. When assessing previous research, one can assume the a VIF above 10 to be used as a threshold indicating multicollinearity (Hair, Black, Babin, & Anderson, 2009). As can be seen in Table 5, the multicollinearity principle is satisfied for all models A, B, C (I & II). In model III and models Aa, Ba, Ca we find some forms of multicollinearity. Further investigating Table 5 we can conclude the following, all multicollinearity present is in models where Tobin's Q and MB_ratio are entered together (both based on the same base variable) and in all regressions including the interaction term. Research mentions that high VIF factors, indicating multicollinearity are safely allowed to be ignored when the high VIF factors result from either entered control variables or interaction term (Allison, 2012). Allison (2012) mentions that as long as the variables resulting in multicollinearity are control variables, high VIF factors in these variables will not affect the coefficients of your variables of interest and will not impair the function and performance of your control variables. Besides that, multicollinearity for interaction terms are normal and will not affect the p-value and will not bias the estimates of your interaction term (Allison, 2012). In order to assure robustness, this research has checked the regressions excluding the control variables ((LN(TQ) and LN(MB_ratio)) and/or the interaction term and found it has not affected the sign or magnitude of the results. Due to increased R^2 and therewith explanatory power in the full models, this research chooses to ignore these 2 cases of multicollinearity. Besides that, as can be seen in model D, OC_1 and EO_1 exert a form of multicollinearity. The multicollinearity in this model can be anticipated due to the fact of the variables being highly intertwined. However, as no definite conclusion will be based on this model and serves as a mere revalidation of earlier found results, this regression will be performed while ignoring the present multicollinearity.

VIF	Model	DE_ratio	OC_1	OC_2	OC_3	EO_1	EO_2	EO_3	LN (Size)	LN (MB_ratio)	ROA	N_Off	LN (TQ)	E-Ind.
Purchase														
CAR_P	A	2.44							1.70	2.24	2.15			
	Aa	2.58							2.32	24.86	2.19	2.07	25.02	1.65
CAR_P	B		2.42						2.20	2.40	2.15			
				1.93					2.13	2.41	2.17			
			11.76	15.70	2.05				2.12	1.95	1.75			
	Ba		2.70						3.04	23.85	2.21	2.11	26.13	1.64
				2.06					2.86	23.50	2.22	2.08	25.34	1.67
			12.72	7.24	16.42				3.28	24.29	2.24	2.15	26.58	1.69
CAR_P	C					1.70			2.02	2.21	2.14			
							1.58		2.08	2.20	2.15			
						8.56	5.47	10.07	2.11	2.23	2.18			
	Ca					1.89			3.03	24.19	2.20	2.12	26.35	1.64
							1.75		3.06	23.74	2.20	2.17	25.63	1.68
						9.41	6.09	11.11	3.23	24.27	2.23	2.38	26.41	1.72
CAR_P	D	2.76	19.56			13.75			3.10	25.55	2.21	4.01	26.91	1.65
Sale														
CAR_S	A	2.86							1.51	1.68	1.24			
	Aa	2.88							1.98	34.12	1.31	1.69	36.45	1.79
CAR_S	B		1.63						1.54	1.93	1.24			
				1.59					1.43	1.90	1.24			
			8.36	6.01	12.15				1.59	2.01	1.25			
	Ba		1.89						2.04	34.19	1.31	1.87	36.55	1.82
				1.96					1.98	34.14	1.31	1.84	37.04	1.93
			8.49	6.38	12.15				2.10	34.39	1.31	1.89	37.08	1.95
CAR_S	C					1.56			1.44	1.97	1.24			
							1.49		1.39	1.94	1.24			
						7.78	9.45	9.82	1.46	2.13	1.25			
	Ca					1.57			1.97	34.15	1.31	1.68	36.60	1.79
							1.51		1.92	34.13	1.32	1.68	36.70	1.81
						7.89	9.94	10.54	2.00	34.40	1.32	1.80	36.71	1.82
CAR_S	D	2.89	10.61			8.81			2.22	34.21	1.32	2.89	36.69	1.57

Table 5 - Variance Inflation Factor Test

5.3 – Capital structure

The coefficients of the regression including significance are reported and the Huber-White standard errors are reported between brackets. Below one can find the R^2 and the number of observations.

Model A – CAR_P	Pred.	I	Ia
DE_ratio	(+)	0.0388*** (0.0077)	0.0232*** (0.0066)
LN(Size)		-0.0533*** (0.0129)	-0.0757*** (0.0133)
LN(MB_ratio)		-0.01028*** (0.0181)	0.2250*** (0.0505)
ROA		1.7694*** (0.2555)	1.8977*** (0.2259)
Number_officers			0.2333*** (0.0592)
LN(TQ)			-0.3024*** (0.0461)
E-Index			0.0168 (0.0175)
Constant		-0.1306*** (0.0992)	-1.0953*** (0.1337)
Industry fixed effects		YES	YES
R^2		0.77	0.80
N		763	763

, * - Significant at 5% & 1% significance level respectively

Table 6 - Capital Structure (P)

In Table 6 of model A, the dependent variable, cumulative abnormal returns of insiders' purchases, is regressed against the independent variable of capital structure, represented by the debt-to-equity ratio, including control variables and industry fixed effects. In this model, one sees that debt-to-equity ratio exerts a significant (at 1% significance level) positive relationship with the cumulative abnormal returns for insiders' purchases. When checking for robustness in model Ia, including the three extra control variables, one can see that both the sign, significance and magnitude of the positive relationship hold. Besides that, all control variables, but E-Index, are significant at 1% significance level, where ROA exerts the largest effect on CAR_P.

Size and Tobin's Q exert a significant negative relationship with CAR_P and ROA and number of officers exert a significant positive effect on CAR_P. Betzer & Theissen (2009) and Fidrmuc, Goergen & Renneboog (2006) find similar a sign for the relationship between size and insider purchases, where they mention larger firms to have a larger analyst following (and thus diminising CAR_P). Besides that Fidrmuc, Goergen & Renneboog (2006) also find number officer blockholders to have a significant positive effect on insider purchases. Further investigating Table 6-Ia, one finds this significant result would entail that increasing equity such that the debt-to-equity ratio would decrease by 1, would result in a decrease of CAR_P 0.023 %. Therewith Table 6 concludes that the increase of equity (relative to debt) has a significant negative effect on insider trading profitability for insider purchases.

The coefficients of the regression including significance are reported and the Huber-White standard errors are reported between brackets. Below one can find the R^2 and the number of observations.

Model A – CAR_S	Pred.	I	Ia
DE_ratio	(-)	-0.0243*** (0.0041)	-0.0254*** (0.0042)
LN(Size)		0.0897*** (0.0050)	0.0669*** (0.0058)
LN(MB_ratio)		0.0504*** (0.0036)	0.1518*** (0.0173)
ROA		0.7938*** (0.0823)	0.8848*** (0.0876)
Number_Officers			-0.0834*** (0.0130)
LN(TQ)			-0.1054*** (0.0175)
E-Index			-0.0240*** (0.0050)
Constant		-0.5706*** (0.1274)	-0.4171*** (0.1388)
Industry fixed effects		YES	YES
R^2		0.33	0.33
N		8977	8977

, * - Significant at 5% & 1% significance level respectively

Table 7 - Capital Structure (S)

In Table 7 of model A, The dependent variable, cumulative abnormal returns of insiders' sales, is regressed against the independent variable of capital structure, represented by the debt-to-equity ratio, including control variables and industry fixed effects. Table 7-I presents a significant negative effect of the debt-to-equity ratio on CAR_S at a 1% significance level. When investigating model Ia one also finds a significant (at 1% significance level) negative effect of the debt-to-equity-ratio on CAR_S. Besides that, the table presents significant effect for all control variables. Where again ROA exerts the largest effect of at 0.88% of CAR_S increase when ROA increases by 100%. Furthermore, size and market-to-book ratio also present a significant positive relationship with CAR_S. Number of officers, Tobin's Q and E-Index have a significant negative relationship with CAR_S. When further assessing the effect of the independent variable, the debt-to-equity ratio, in model Ia, one finds that increasing equity such that the debt-to-equity ratio decreases by 1, will result in an increase in the cumulative abnormal returns of insiders' sales by 0.025%. Therewith Table 7 concludes the increase of equity (as relative to debt) to have a significant negative effect on insider trading profitability for insider sales.

When revisiting our hypotheses from section 2.4.1, as can be seen below, one can conclude that both hypothesis 1 and 1.1 cannot be rejected based on the found results in Table 6 & 7.

H1: The debt/equity ratio exerts a positive relationship with CAR_P
H1.1: The debt/equity ratio exerts a negative relationship with CAR_S

This finding entails that the concept of active monitoring by shareholders, as defined by Jensen & Meckling (1976), would result in lower insider trading profitability. Due to the presence of information asymmetry and increased trading traffic between shareholders and insiders (Beny, 2004), outsiders (i.e. shareholders) face the risk of being the losers to the informational advantaged insiders' winning trades (Maug, 2002), which consequently results the crowding-out effect (Leland, 1992; Fishman & Haggerty, 1992). Shareholders, as opposed to debt holder, have more upside potential and as research indicated will, therefore, more actively engage in monitoring (Scott, 1977). As a result, the shareholders will actively engage in monitoring to reduce this risk (Maug's loser effect) and therewith reduce insider trading profitability by reducing the informational advantage in trades (Eldabry, Gounopoulos & Skinner, 2015). To conclude that increasing equity, as opposed to debt (decreasing the debt-to-equity ratio), will reduce insider trading profitability for both insider purchases and sales.

5.4 – Ownership concentration

The coefficients of the regression including significance are reported and the Huber-White standard errors are reported between brackets. Below one can find the R^2 and the number of observations. Model I-III represent the regressions of the different independent variables against the CAR_P.

Model B – CAR_P	Pred.	I	Ia	II	IIa	III	IIIa
OC_1	(-)	-0.0038 (0.0144)	-0.0474*** (0.0149)			0.0573 (0.0324)	0.0016 (0.0338)
OC_2	(-)			-0.0015 (0.0013)	-0.0040*** (0.0012)	-0.0010 (0.0025)	-0.0005 (0.0024)
OC_3	(-)					-0.0009 (0.0005)	-0.0007 (0.0006)
LN(Size)		-0.0610*** (0.0170)	-0.1098*** (0.0172)	-0.0676*** (0.0163)	-0.1061*** (0.0164)	-0.0594*** (0.0175)	-0.1058*** (0.0191)
LN(MB_ratio)		-0.0822*** (0.0191)	0.2901*** (0.0499)	-0.0890*** (0.0181)	0.2768*** (0.0494)	-0.0863*** (0.0192)	0.2771*** (0.0510)
ROA		1.7190*** (0.2613)	1.9366*** (0.2256)	1.7448*** (0.2566)	1.9557*** (0.2232)	1.7331*** (0.2564)	1.9346*** (0.2224)
Number_officers			0.2713*** (0.0575)		0.2655*** (0.0596)		0.2796*** (0.0615)
LN(TQ)			-0.3748*** (0.0487)		-0.3620*** (0.0483)		-0.3648*** (0.0509)
E-Index			0.0171 (0.0178)		0.0114 (0.0186)		0.0122 (0.0190)
Constant		-0.6526*** (0.1341)	-0.7283*** (0.1844)	-0.0031 (0.1435)	-0.7432*** (0.1882)	-0.6475*** (0.1828)	-0.8276*** (0.2237)
Industry fixed effects		YES	YES	YES	YES	YES	YES
R^2		0.76	0.80	0.76	0.80	0.76	0.80
N		763	763	763	763	763	763

, * - Significant at 5% & 1% significance level respectively

Table 8 - Ownership Concentration (P)

In model B, the cumulative abnormal returns of insiders' purchase, CAR_P, is regressed against the different independent variables representing ownership concentration, as respectively: the total number of blockholders (model I), the percentage of shares held by the total number of blockholders (model II) and the interaction term between these two variables (model III).

As seen in Table 8 model Ia & IIa, both the total number of blockholders as total percentage of shares held by blockholders exerts a significant (at 1% significance level) relationship with CAR_P. Where, more specifically, the gain of 1 blockholder and the increase of 1% shareholdings, decreases CAR_P with 0.047% and 0.004%, respectively. In model III one finds that in both models the interaction term is not significant. When assessing the control variables one finds that both size and Tobin's Q exert a significant negative relationship with CAR_P, in all models. Again, return on assets exerts a significant positive effect with CAR_P and representing the largest effect in magnitude, where an increase of ROA by 100% entails a 1.7-1.9% increase in CAR_P. Investigating Fidrmuc, Goergen & Renneboog (2006) one also finds a significant positive result for their relationship between insider purchase and insider sales (as can be seen in Table 9) and their profitability proxy (i.e. ROE) to a similar magnitude as found in this research. The number of officers exerts a significant positive relationship with CAR_P, over all models. To conclude that by assessing Table 7-Ia & IIa, a significant negative relationship with the two different variables for ownership concentration with insider trading profitability, as defined by CAR_P, is found. As such, one can conclude ownership concentration to have a negative effect on insider trading profitability for insider purchases.

The coefficients of the regression including significance are reported and the Huber-White standard errors are reported between brackets. Below one can find the R^2 and the number of observations. Model I-III represent the regressions of the different independent variables against the CAR_S.

Model B – CAR_S	Pred.	I	Ia	II	IIa	III	IIIa
OC_1	(+)	0.0328*** (0.0041)	0.0421*** (0.0045)			0.1513*** (0.0101)	0.1622*** (0.0103)
OC_2	(+)			0.0007 (0.0004)	0.0008** (0.0004)	0.0026*** (0.0007)	0.0022*** (0.0008)
OC_3	(+)					-0.0024*** (0.0002)	-0.0024*** (0.0002)
LN(Size)		0.1144*** (0.0049)	0.0955** (0.0056)	0.1020*** (0.0047)	0.0801*** (0.0055)	0.1260*** (0.0051)	0.1042*** (0.0058)
LN(MB_ratio)		0.0589*** (0.0039)	0.1583*** (0.0171)	0.0490*** (0.0038)	0.1510*** (0.0173)	0.0638*** (0.0040)	0.1731*** (0.0177)
ROA		0.7321*** (0.0813)	0.8348*** (0.0865)	0.7615*** (0.0815)	0.8553*** (0.0861)	0.7788*** (0.0823)	0.8790*** (0.0885)
Number_Officers			-0.01192*** (0.0142)		-0.0855*** (0.0133)		-0.1118*** (0.0143)
LN(TQ)			-0.0989*** (0.0173)		-0.1054*** (0.0178)		-0.1111*** (0.0179)
E-Index			-0.0175*** (0.0050)		-0.0209*** (0.0054)		-0.0254*** (0.0053)
Constant		-0.8985*** (0.1418)	-0.8260*** (0.1580)	-0.7033*** (0.1263)	-0.5739*** (0.1385)	-1.1622*** (0.1370)	-1.0451*** (0.1529)
Industry fixed effects		YES	YES	YES	YES	YES	YES
R^2		0.33	0.34	0.33	0.34	0.35	0.36
N		8977	8977	8977	8977	8977	8977

, * - Significant at 5% & 1% significance level respectively

Table 9 - Ownership Concentration (S)

In Model B, as presented in Table 9 above, the different ownership concentration variables are regressed against cumulative abnormal returns for insiders' sales, CAR_S. Model I & Ia, where the independent variable 'total number of blockholders' is used presents a significant positive effect with CAR_S. In model IIa, where 'the percentage of shares held by the total number of blockholders' is used also presents a significant positive effect (at 1% significance level) with CAR_S. Finally model III and IIIa, also present significant positive effects of the two variables indicating ownership concentration and significant (at 1% significance level) negative effects for both interaction terms.

More specifically, one can conclude that when the firm gains 1 blockholder and the increase of 1% shareholdings, results in an increase of CAR_S by 0.042% and 0.001%, respectively. Besides that, the significant negative effect of the interaction term (at 1% significance level), indicates that, while holding the number of blockholders constant, and increasing percentage held by blockholders by 1%, the originally positive effect of the ownership concentration on CAR_S, will decrease with 0.002%. In other words, blockholders that grow their percentage held, will reduce their positive effect on CAR_S. When assessing the control variables, one finds that size, market-to-book ratio and ROA exert a significant positive effect on CAR_S. Number of officers, Tobin's Q and E-index exert a significant negative effect with CAR_S. Ravina & Sapienza (2009), making use of the same E-index, also find a significant negative effect on abnormal returns of insider trades. Therewith from Model B can be concluded that ownership concentration, as defined by total number of blockholders, exerts a significant positive relationship with cumulative abnormal returns of insiders' sales. To conclude from Table 9 that ownership concentration has a negative effect on insider trading profitability for insider sales. However, as concluded from the interaction term, blockholders that grow in size will decrease their originally diminishing effect on insider trading profitability.

When revisiting our hypotheses from section 2.3.2, as can be seen below, one can conclude that both hypothesis 2 and 2.1 cannot be rejected based on the found results in Table 8 & 9.

H2: The presence of blockholder(s) exerts a negative relationship with CAR_P
H2.1: The presence of blockholder(s) exerts a positive relationship with CAR_S

This finding builds on the fundamental of larger shareholders, i.e. blockholders, having more incentive to monitor management, as identified in previous research by Shleifer & Vischy (1986) & Grossman & Hart (1980). Larger shareholders have more to lose and therewith will be more incentivized to actively engage in monitoring. Besides that, large shareholders have more tools and pose a larger threat to management, therewith being able to create a strong disciplining effect when monitoring (Urban, 2015). As such, found in previous research, firms with a more concentrated ownership structure reduce information asymmetry (Fidrmuc, Goergen & Renneboog, 2006) and reduce overall insider trading profitability (Hirschey & Zaima, 1989; Betzer & Theissen, 2009). Concluding that having a more concentrated ownership will reduce insider trading profitability for both insider purchases and sales.

5.5 – External ownership

The coefficients of the regression including significance are reported and the Huber-White standard errors are reported between brackets. Below one can find the R^2 and the number of observations. Model I-III represent the regressions of the different independent variables against the CAR_P.

Model C – CAR_P	Pred.	I	Ia	II	IIa	III	IIIa
EO_1	(-)	-0.0159 (0.0157)	-0.0310** (0.0145)			0.0605 (0.0338)	0.0493 (0.0329)
EO_2	(-)			-0.0052*** (0.0014)	-0.0055*** (0.0013)	-0.0115*** (0.0023)	-0.0075*** (0.0023)
EO_3	(-)					-0.0004 (0.0007)	-0.0003 (0.0007)
LN(Size)		-0.0659*** (0.0171)	-0.1004*** (0.0171)	-0.0854*** (0.0174)	-0.1180*** (0.0173)	-0.0812*** (0.0176)	-0.1117*** (0.0182)
LN(MB_ratio)		-0.0854*** (0.0193)	0.2873*** (0.0501)	-0.0981*** (0.0191)	0.2932*** (0.0507)	-0.0921*** (0.0194)	0.2784*** (0.0496)
ROA		1.7264*** (0.2616)	1.9072*** (0.2285)	1.7713*** (0.2551)	1.9278*** (0.2238)	1.7936*** (0.2585)	1.9064*** (0.2281)
Number_Officers			0.2289*** (0.0576)		0.2025*** (0.0586)		0.2093*** (0.0622)
LN(TQ)			-0.3612*** (0.0485)		-0.3786*** (0.0491)		-0.3615*** (0.0495)
E-Index			0.0189 (0.0178)		0.0072 (0.0182)		0.0023 (0.0189)
Constant		-0.6108*** (0.1274)	-0.8511 (0.1810)	-0.4624*** (0.1236)	-0.5921*** (0.1952)	-0.5134 (0.1440)	-0.6623*** (0.2168)
Industry fixed effects		YES	YES	YES	YES	YES	YES
R^2		0.76	0.80	0.77	0.80	0.77	0.80
N		763	763	763	763	763	763

, * - Significant at 5% & 1% significance level respectively

Table 10 - External Ownership (P)

Following, the effect of external ownership on the cumulative abnormal returns of insiders' purchases is assessed. In Model C one finds the different independent variables in Models I-III representing external ownership, namely: the total number of outside blockholders (model I), the percentage shares held by the total number of outside blockholders (model II) and an interaction term between these two variables (model III).

From model Ia, II & IIa can be concluded that increasing the total number of outside blockholders by 1 and increasing the percentage of shares held of outside blockholders by 1% will reduce CAR_P by 0.031% and 0.006%, respectively. Size and Tobin's Q exert a significant negative relationship with CAR_P and ROA and number of officers a significant positive relationship with CAR_P. In model III & IIIa one can see that the interaction yields no significant results. Therewith, from Model C, can be concluded that external ownership, as defined by the number of blockholders and the percentage held by total number of outside blockholders, exerts a significant negative relationship with the cumulative abnormal returns of insiders' purchases. In conclusion, from Table 10, one can conclude that external ownership has a significant negative effect on insider trading profitability, for insider purchases.

The coefficients of the regression including significance are reported and the Huber-White standard errors are reported between brackets. Below one can find the R^2 and the number of observations. Model I-III represent the regressions of the different independent variables against the CAR_S.

Model C – CAR_S	Pred.	I	Ia	II	IIa	III	IIIa
EO_1	(+)	0.0485*** (0.0046)	0.0459*** (0.0045)			0.1551*** (0.0093)	0.1570*** (0.0094)
EO_2	(+)			0.0020*** (0.0004)	0.0017*** (0.0004)	-0.0012 (0.0009)	-0.0024** (0.010)
EO_3	(+)					-0.0020*** (0.0002)	-0.0019*** (0.0002)
LN(Size)		0.1156*** (0.0048)	0.0943*** (0.0055)	0.1052*** (0.0047)	0.0826*** (0.0056)	0.1225*** (0.0048)	0.0999*** (0.0057)
LN(MB_ratio)		0.0655*** (0.0040)	0.1565*** (0.0172)	0.0547*** (0.0039)	0.1523*** (0.0172)	0.0728*** (0.0043)	0.1725*** (0.0177)
ROA		0.7289*** (0.0815)	0.8139*** (0.0871)	0.7431*** (0.0813)	0.8363*** (0.0864)	0.7833*** (0.0831)	0.8595*** (0.0891)
Number_Officers			-0.0752*** (0.0132)		-0.0745*** (0.0129)		-0.0574*** (0.0143)
LN(TQ)			-0.0959*** (0.0173)		-0.1034*** (0.0175)		-0.1068*** (0.0178)
E-Index			-0.0210*** (0.0049)		-0.0215*** (0.0050)		-0.0283*** (0.0050)
Constant		-0.8847*** (0.1301)	-0.7400*** (0.1393)	-0.7516*** (0.1284)	-0.5972*** (0.1372)	-1.0415*** (0.1304)	-0.8631*** (0.1388)
Industry fixed effects		YES	YES	YES	YES	YES	YES
R^2		0.34	0.35	0.33	0.34	0.36	0.36
N		8977	8977	8977	8977	8977	8977

, * - Significant at 5% & 1% significance level respectively

Table 11 - External Ownership (S)

Finally, the different external ownership variables against cumulative abnormal returns of insiders' sales, CAR_S, is regressed. To begin with, by assessing model I & II, one finds that both total number of outside blockholders and total percentage of shares held by outside blockholders, exerts a significant positive effect on CAR_S. Where, more specifically, increasing the number of outside blockholders by 1 or increasing the percentage of shares held by outside blockholders by 1%, increases CAR_S by 0.046% and 0.0017%, respectively.

Again, the interaction term yields a significant negative effect for both model III as well as model IIIa, where keeping the number of outside blockholders constant and growing the percentage of shares held by outside blockholders by 1%, will decrease the original positive effect by 0.002%. Furthermore, when assessing the control variables, one finds that size, market-to-book-ratio and ROA exert a significant positive effect on CAR_S and number of officers, Tobin's Q and E-Index exert a significant negative relationship with CAR_S. Betzer & Theissen (2009) also find a negative sign for insider purchases and market-to-book-ratio and a positive sign for the relationship with insider sales. Therewith from Model C can be concluded that external ownership as defined by total number of outside blockholders, the percentage of shares held by total number of outside blockholders, exert a significant positive relationship with cumulative abnormal returns for insiders' sales. In conclusion, from Table 11, one can conclude that external ownership has a significant negative effect on insider trading profitability, for insider sales. However, as concluded from the interaction term, blockholders that grow in size will decrease their originally diminishing effect on insider trading profitability.

When revisiting the hypotheses from section 2.3.3 one conclude that hypotheses 3 & 3.1 cannot be rejected based on the found results from Table 10 & 11.

H3: The presence of outside blockholders exerts a negative relationship with CAR_P
H3.1: The presence of outside blockholders exerts a positive relationship with CAR_S

These results confirm the idea that outside ownership will more actively monitor management. Research by Fidrmuc, Goergen & Renneboog (2006) indicated that outside shareholders indeed more actively monitor management and therewith reduce insider's trading abnormal returns. This result is also confirmed by different research (Kahn & Winton, 1998; Bloch & Hege, 2001; Noe, 2002). This reduction in abnormal returns is among others attained by reducing the information advantage, as research by Boehmer & Kelly (2009) indicated outside investors to result in more informational efficient stock prices, in other words, reducing information asymmetry. Concluding that increased outside ownership will reduce insider trading profitability for both insider purchases and sales.

5.6 – Revalidation of all ownership effects

Finally in the models in this section, the different ownership variables are entered together. In this manner, one can control for the effects of the different ownership variables. By controlling for the effects of debt-to-equity-ratio, ownership concentration and external ownership, one can revalidate the effects as found in sections 5.3-5.5, based on significance and sign.

The coefficients of the regression including significance are reported and the Huber-White standard errors are reported between brackets. Below one can find the R^2 and the number of observations. Model Ia represent the regression of the different independent variables against the CAR_P.

Model C – CAR_P	Pred.	Ia
DE_ratio	(+)	0.0192*** (0.0068)
OC_1	(-)	-0.1010*** (0.0371)
EO_1	(-)	0.0572 (0.0347)
LN(Size)		-0.1021*** (0.0171)
LN(MB_ratio)		0.2442*** (0.0508)
ROA		1.9648*** (0.2206)
Number_Officers		0.3208*** (0.0684)
LN(TQ)		-0.3453*** (0.0484)
E-Index		0.0132 (0.0176)
Constant		-0.7666 (0.1810)
Industry fixed effects		YES
R^2		0.80
N		763

, * - Significant at 5% & 1% significance level respectively

Table 12- All ownership effects (P)

As one can see in Table 12, where all ownership effect are regressed against insider purchases, both debt-to-equity ratio and ownership concentration remain significant when controlling for the other ownership effects. External ownership however, when controlled for debt-to-equity ratio and ownership concentration becomes insignificant. Furthermore, one can see that the effects of debt-to-equity ratio and ownership concentration have the same sign as found in the regressions in section 5.3 (Table 6) and section 5.4 (Table 8).

The coefficients of the regression including significance are reported and the Huber-White standard errors are reported between brackets. Below one can find the R^2 and the number of observations. Model Ia represent the regression of the different independent variables against the CAR_S.

Model C – CAR_S	Pred.	Ia
DE_ratio	(-)	-0.0276*** (0.0043)
OC_1	(+)	-0.0039 (0.0091)
EO_1	(+)	0.0505*** (0.0092)
LN(Size)		0.0836*** (0.0058)
LN(MB_ratio)		0.1565*** (0.0172)
ROA		0.8363*** (0.0884)
Number_Officers		-0.0778*** (0.0156)
LN(TQ)		-0.0906*** (0.0173)
E-Index		-0.0216*** (0.0050)
Constant		-0.6284*** (0.1478)
Industry fixed effects		YES
R^2		0.44
N		8977

, * - Significant at 5% & 1% significance level respectively

Table 13 - All ownership effects (S)

When assessing Table 13, one can validate that for insider sales, the debt-to-equity ratio and external ownership remain significant when controlling for the other ownership effects. Ownership concentration however, when controlling for differences in debt-to-equity ratios and external ownership differences, will become insignificant. Furthermore, one can see that the sign of both debt-to-equity ratio and external ownership is similar as in the regressions performed in section 5.3 (Table 7) and section 5.5 (Table 11).

As mentioned in the previous sections, revalidating the control variables for the regressions of insider purchases and insider sales, one finds similar results in other researches. For insider purchases, one finds similar signs and magnitudes for the significant positive effects of ROA and number of officers and the significant negative effects of size and market-to-book-ratio, in the researches of Fidrmuc, Goergen & Renneboog (2006), Betzer & Theissen (2009) and Ravina & Sapienza (2009). For insider sales, one finds similar signs and magnitudes for the significant positive effects of market-to-book-ratio and ROA and the significant negative effect of the E-index, in the researches of Fidrmuc, Goergen & Renneboog (2006), Betzer & Theissen (2009) and Ravina & Sapienza (2009).

In conclusion, from this section can be validated that when controlling for the other effects of ownership none of the signs change in either insider purchases and sales. The debt-to-equity ratio remains significant in both the insider purchases' and sales' regressions. Ownership concentration and external ownership change in significance depending on the direction of the insider trade. The debt-to-equity ratio can be concluded to be statistically strong (i.e. when controlling for the ownership effects). For ownership concentration and external ownership no conclusive evidence can be presented, as this significance very much depends on the direction of the insider trade.

6.0 – Discussion

In the following section, the results as found in section 5.0 are analysed and interpreted. To begin with the results of ownership structure, where after ownership concentration and external ownership are discussed.

6.1 – Capital structure

As discussed in section 2.4.1 the decision on how to define the optimal capital structure is a much-researched topic and as such several theories surrounding optimal capital structure exist (i.e. the static tradeoff theory, the pecking order theory and the market timing theory). From these theories, numerous incentives as why to choose a specific capital structure can be derived. However, almost no previous research has been performed, into the effect of capital structure on limiting insider trading profitability and therewith limiting the (agency) costs accompanied by illegal insider trading. For this hypothesis, this research builds on two fundamentals derived from capital structure. To begin with, equity holders are last in line when a company goes bankrupt. Consequently equity holders, as opposed to debt holders, have more upside potential and therewith benefit from long-term firm growth (Scott, 1977). As illegal insider trading results in several lemon-problems (i.e. larger bid-ask spread, a higher discount rate and lower liquidity in the market for the company's shares) and lost managerial time, disruption of the business, and negative publicity (Bettis, Coles & Lemmon, 1999), equity holders will be more incentivized to actively monitor on the legality of insider trading. Besides that, outsiders (i.e. shareholders) face the risk of being the losers to the informational advantaged insiders' winning trades (Maug, 2002), consequently resulting in the crowding-out effect of the stock market (Leland, 1992; Fishman & Haggerty, 1992). Again, therefore equity holders will be more incentivized to actively monitor to not incur unnecessary losses.

From the results in section 5.3, one can conclude that capital structure, as measured by the debt-to-equity ratio, indeed has a significant negative effect on insider trading profitability, measured as CAR_P & CAR_S. More specifically, when debt-to-equity ratio decreases by 1 CAR_P decreases by 0.023 % and CAR_S increases by 0.025%.

Also, can be concluded that this effect is robust to other and more control variables and the other ownership effects and that this effect is largest for insider sales. Assessing the magnitude of the effect one can conclude the following; considering a mean CAR_P of 0.19% CAR_S of -0.37%, a decrease in the debt-to-equity ratio by 1 would entail a 12.1% decrease of CAR_P and a 6.8% increase in CAR_S, from the mean. This decrease in insider trading profitability can be concluded to economically significant.

Bases on these results, the hypothesis H1 & H1.1 cannot be rejected and therewith this research concludes that, for both insider purchases and sales, increasing equity relative to debt will decrease insider trading profitability.

6.2 – Ownership concentration

Ownership concentration is, as defined by Demsetz & Lehn (1985), determined by four pillar control potential (e.g. private benefits), systemic regulation (e.g. legal environment), firm-specific factors (e.g. size and risk) and industry-specific factors (e.g. industry regulation, information asymmetries, competition intensity, and product life cycle stage). As defined between brackets, each of these pillars has specific concepts that create an incentive to concentrate or diffuse ownership. When investigating research on insider trading specifically, one finds that larger shareholders (i.e. blockholders) have more incentive to monitor management, as monitoring is costly, as compared to smaller shareholders (Shleifer & Vischy, 1986; Grossman & Hart, 1980). Besides having more incentive to monitor management, larger shareholders also have more effective tools to discipline management (e.g. larger vote) (Urban, 2015). As such, previous research on ownership concentration concludes lower abnormal returns for more concentrated owned companies (Betzer & Theissen, 2009), among other due to lower information asymmetry (Fidrmuc, Goergen, & Renneboog, 2006; Hirschey & Zaima, 1989). As mentioned in section 6.1, these blockholders have the same incentives as for why to monitor management (i.e. company's (lemon) problems & Maug's loser effect).

Investigating the results as found in section 5.4, one can conclude that ownership concentration, as measured as the total number of blockholders, the percentage held by the total number of blockholders and the interaction term between these two variables, has a significant negative effect on insider trading profitability, as measured by CAR_P & CAR_S. Where more specifically, the CAR_P decreases by 0.047% and 0.004%, when increasing the total number of blockholders by 1 or increasing the percentage held by total number of blockholders by 1%, respectively. CAR_S, decreases 0.042% and 0.001% when increasing the total number of blockholders by 1 or increasing the percentage held by total number of blockholders by 1%, respectively. Besides that, the interaction term yields a significant negative effect for CAR_S, which indicates that, while holding the number of blockholders constant, and increasing percentage held by blockholders by 1%, the insider trading profitability diminishing effect, will decrease with 0.002%. Assessing the magnitude of the effect one can conclude the following; considering a mean CAR_P and CAR_S, increasing the total number of blockholders by 1/increasing the percentage held by total number of blockholders by 1%, would entail a decrease of CAR_P by 24.7%/2.11% and a 11.4%/0.27% increase in CAR_S, from the mean. This decrease in insider trading profitability can be concluded to economically significant, especially for the effect of an extra blockholder.

Bases on these results, the hypothesis H2 & H2.1 cannot be rejected and therewith this research concludes that, for both insider purchases and sales, increasing ownership concentration will decrease insider trading profitability.

6.3 – External ownership

Finally, the effect of external ownership on insider trading profitability will be assessed. Section 2.3.3 discusses the different forms of external ownership, which are defined as bank ownership, family ownership, company ownership, institutional ownership and governmental ownership. (Thomson & Pedersen, 2000). Each of these different forms of external ownership is accompanied by different incentives to monitor. However, as noted by several researches, overall, external ownership will more closely and actively monitor management than internal ownership (Kahn & Winton, 1998; Bloch & Hege, 2001; Noe, 2002).

More specifically Fidrmuc, Goergan & Renneboog (2006) find that external ownership, as compared to internal ownership, will reduce insider trading abnormal returns. Besides that, external ownership will increase price information efficiency and reduce information asymmetry (Boehmer & Kelley, 2009). Among other, outsiders will be more stringent on insider trading law and enforcement (Beny, 2004).

Again, as mentioned in section 6.1, these blockholders have the same incentives as for why to monitor management (i.e. company's (lemon) problems & Maug's loser effect). When investigating the results from section 5.5, one can conclude that external ownership, as measured by the total number of outside blockholders, the percentage held by the total number of outside blockholders and the interaction term between these two variables, has a significant negative effect on insider trading profitability, as measured by CAR_P & CAR_S. More specifically one finds that increasing the total number of outside blockholders by 1 or increasing the percentage of shares held by outside blockholders by 1%, decreases CAR_P with 0.031% and 0.006% and increases CAR_S 0.046% and 0.0017%, respectively. Again, the interaction term yields a significant negative effect, which indicates that keeping the number of outside blockholders constant and growing the percentage of shares held by outside blockholders by 1%, will decrease the insider trading profitability diminishing effect by 0.002%. Assessing the magnitude of the effects, one can conclude, considering the mean of both CAR_P and CAR_S, that increasing the total number of outside blockholders by 1/increasing the percentage of shares held by outside blockholders by 1%, results in a reduction of insider trading profitability by 16.3%/3.2% for CAR_P and 12.4%/0.46% for CAR_S. Consequently economical significance can be concluded, especially for insider purchases.

6.4 – The undiscussed effects

Apart from the effect, as already hypothesized by research, that the different ownership structures have a mitigating effect on insider trading profitability, some effects, as found in the results, must still be discussed.

To begin with, this research finds that for all different ownership structures the "sales" regressions to exert more significant (and usually larger) results than the "purchases" regressions. In section 2.1.2 Aboody & Lev (2000) mention that through information asymmetry profit is made, where more specifically, informed investors expropriate the uninformed investors. Eldabry, Gounopoulos, & Skinner (2015) and Cormier, Ledoux, Magnan & Aerts (2009), in section 2.2.2, consequently mention that shareholders have the possibility to monitor and that through improved information disclosure they will reduce information asymmetry. As such, through monitoring, shareholders will reduce the risk of being expropriated in insider trading, due to having an informational disadvantage. Due to frequent traffic between insiders and shareholders, improved information disclosure is thus more essential when insider sell (and shareholder buy) their stock as to when they purchase (and shareholders sell) their stock. This effect might be clarified by the loss aversion bias, explained under the prospect theory, as designed by Kahneman & Tversky (1979). They mention that investors experience the psychological pain of losing as twice as powerful as the psychological pleasure of gaining (Kahneman & Tversky, 1979). In conclusion, that investors, therefore, will especially increase monitoring around insiders' sales, as compared to insiders' purchases, as there they face the risk of losing (with insiders' sales), as opposed to the risk of missing a potential gain (with insiders' purchases). Under this theory, the loss aversion theory, might explain the more significant effect found in the results for insiders' sales as opposed to insiders' purchases.

Secondly, this research finds the mitigating effect of (outside) ownership (concentration) on insider trading profitability to decrease as the blockholder grows in size, as measured in the percentage of shares held. To further elaborate on this result, a reference to section 2.2.2 must be made. Maug (2002) mentions that information asymmetry allows insiders to gain on insider trading at the cost of the shareholders, in this research labelled as the Maug's loser effect. Besides that, Maug (2002) indicates that profits made by trading on inside information are an opportunity cost of monitoring and correct regulation or prohibition of insider trading would eliminate this opportunity cost. He mentions that managers, absent of proper regulation, may find it advantageous to inform dominant shareholders with inside information. As a result, dominant shareholders will make use of this inside information to make profitable trades and abstain from further monitoring, as mentioned by Maug (2002) to be the "cozy cartel" at the expense of small shareholders. These cozy cartels, therefore, might explain the existence of the negative effect of the interaction terms.

Thirdly, when comparing the mitigating effects of the different ownership structure forms (capital structure, ownership concentration and outside ownership), one finds that the effect of outside ownership is largest. Previous research confirms the notion that outside shareholders will be likely to monitor management more (Fidrmuc, Goergan & Renneboog, 2006; Boehmer & Kelley, 2009; Mustapha & Ahmad, 2010). The argument is mainly based on the fact that outside shareholders do not enjoy the benefits of control as enjoyed by insiders, e.g. corporate assets for personal use, empire building motives, project selection (Gomes & Novaes, 2006). As monitoring is costly one finds that larger shareholders (i.e. blockholders) have more incentive to monitor (Shleifer & Vischy, 1986; Grossman & Hart, 1980). However, as discussed in the previous paragraph, when growing in size as a shareholder, the possibility of forming a "cozy cartel" with managers is present. Research on outside directors might provide an interesting parallel for outside shareholders (Marouan, 2015). Outside directors, like outside shareholders, do not have a material or pecuniary relationship with management and are therefore less likely to be entrenched. As such, they are more likely to control vigilantly control management on opportunistic behaviour (e.g. illegal insider trading). As mentioned by Marouan (2015) outside directors (shareholders) affect the performance/behaviour of the company through two approaches, namely the resource-based view (i.e. expertise) and the dependency theory, where outsiders play a large role in the arbitration of agency problems between insiders and outsiders. Under the dependency theory, outsiders in this research, by arbitration might thus mitigate agency problems, such as illegal insider trading, as they are less likely to be entrenched. Consequently this might explain why external ownership exerts the largest mitigating effect on the insider agency problem, measured by insider trading profitability.

Concluding this section with the notion that, in order to diminish insider trading profitability, by reducing information asymmetry (and illegal insider trading), companies should focus on ownership concentration instead of increasing diluted shareholders (capital structure). However, one should take notice that companies with too large shareholder might face the risk of the formation of cozy cartels with managers. Besides that, outside shareholders, under the dependency theory will make the largest mitigating impact on insider trading profitability. Overall, all these results are most significant in insider sales, as possibly explained under the loss aversion theory, shareholders will increase monitoring (and improve information disclosure) more for sales than purchases.

7.0 – Conclusion

In the following section this research answers the initial research question, it discusses limitations and presents fitting recommendations.

From research can be concluded that illegal insider trading still remains a problem in the financial market, as mentioned by the SEC (Thomson, 2006). Besides that, as investigated by several researches, illegal insider trading has severe adverse effects on the firm and consequently its shareholders. These adverse effects materialize in the form of company lemon-problems (i.e. larger bid-ask spread, a higher discount rate and lower liquidity in the market for the company's shares), lost managerial time, disruption of the business, and negative publicity (Bettis, Coles & Lemmon, 1999). Besides that, insiders trading on an illegal informational advantage will consequently profit from the informational disadvantage of the shareholders, therewith making the shareholders bear the costs of the insiders' winning trade (Maug, 2002). Furthermore, this effect surrounding information asymmetry has adverse effects on the financial market, also identified as the crowding-out effect (Leland, 1992; Fishman & Haggerty, 1992). However, as mentioned by Seyhun (1992), Bris (2003), Jagolinzer (2009) and Dalko & Wang (2016) regulation around illegal insider trading has not been effective in eliminating these problems and as researched by Augustin, Brenner & Subrahmanyam (2014) currently still a lot of illegal insider trading takes place.

Consequently the question arises which policies a company can adapt to mitigate the negative effects of illegal insider trading. Anderson (2016) mentions that companies impose several policies in search of mitigating insider trading based on non-public information (i.e. illegal insider trading). Anderson (2016) finds companies to adopt either i) a published ban on trading any of the issuer's shares (self-policing), ii) pre-clearance and iii) black-out periods. However, he concludes that apart from these measures often being ineffective, they will also weigh heavy on company culture, cost of compensation, cost of capital and existing shareholders and therewith are undesirable.

This research finds illegal insider trading to be an agency problem between the insiders and the shareholders; an action from which the shareholders face the negative effects. In 1976 Jensen & Meckling (1976) already proposed a concept with the goal of mitigating agency problems, namely: active monitoring. Active monitoring by shareholders includes shareholder activism either in the form of voting, engagement or intervention.

For insider trading specifically, monitoring is found to, through improved information disclosure, have a mitigating effect on information asymmetry and therewith reducing the informational advantage of the insider (Cormier, Ledoux, Magnan & Aerts, 2009; Eldabry, Gounopoulos, & Skinner, 2015). As identified in this research the level of monitoring very much depends on the form of ownership. Consequently the question arises if ownership structure, through monitoring, has an effect in (partially) eliminating illegal insider trading. As such, this research poses the research question:

"What is the effect of ownership structure on insider trading profitability?"

Not much research has been performed on this relationship, however an academic insight in this relationship could prove highly valuable for among others shareholders, companies and regulatory institutions in search of mitigating illegal insider trading. Consequently three hypotheses are formed around the concepts of: capital structure (equity relative to debt), ownership concentration (blockholders) and external ownership (outside blockholders).

This research finds in all three hypotheses the hypothesized effect of ownership structure to have a negative effect on insider trading profitability. To begin with, this research finds the increase of equity (as relative to debt) to decrease insider trading profitability for both insider purchases and sales. Secondly, this research finds an increase in ownership concentration, either in number of blockholders as well as % of shares held by blockholders, to negatively affect insider trading profitability. Thirdly, this research finds the largest negative effects on insider trading profitability to be a result of external ownership. External ownership, measured as the number of outside blockholders as well as % of shares held by outside blockholders, negatively affects insider trading profitability. To conclude, this research finds in all three hypotheses the hypothesized effect of ownership structure to have a negative effect on insider trading profitability. Besides that, this research finds that increasing the size of the blockholders does not improve the negative effect of blockholders on insider trading profitability. Contrarily, increasing the size of blockholders decreases the mitigating effect of blockholders on insider trading profitability.

Concluding that companies, in search of mitigating illegal insider trading, should focus on outside ownership concentration, as opposed to more diluted shareholders or inside blockholders. Also, companies should be aware of cozy cartels between managers and dominant shareholders. Lastly, companies can expect all efforts to be most present when insiders sell their stock, as opposed to insiders purchasing stock.

This research provides insight into a previously unexplored relationship between ownership structure and the profitability of insider trading. The findings imply a rationalized effect of shareholders on mitigating illegal insider trading, by reducing the information asymmetry between themselves and managers. Furthermore, differences in ownership structures and their effect on insider trading profitability are assessed. As such, this research poses as a building block for future research pursuing to further understand the mitigation of illegal insider trading.

7.1 – Limitations & Recommendations

In this section, this research discusses the limitations and consequently the recommendations for future research.

To begin with, this research makes use of a cross-sectional dataset. Due to the fact that a few months already result in a very large dataset and insider trading profitability is measured over 6 months, performing a 1-year analysis allowed to efficiently match the dependent and independent variables. Besides that, 2001 is chosen as this is the most recent year that contains extensive and cleansed data on ownership structure in the Dlugosz et al. (2006) dataset and manual collection is found to be very time-consuming and above all often inaccurate. 2001 also is affected by the after-effect of the internet bubble. However, as the financial market mostly restored in 2001 and the measure for insider trading profitability is a relative (to the market) measure, no large problems are expected. Nonetheless, the first recommendation for future research would be to investigate this relationship over multiple years with even more recent data. Secondly, as already mentioned in this research, it proves very hard to prove illegality in insider trades. This research makes use of abnormal returns and regresses against hypothesized mitigating effects of information asymmetry (i.e. ownership structure), as such establishing the mitigation of illegal insider trading. This decision is made due to the fact that, for students, no data is available on illegal insider trades and this measure is a widely used methodology to attain appropriate results. A strong recommendation to academic future research, however, would be to make use of a dataset that only includes prosecuted (and found guilty) illegal insider trades ((e.g. Meulbroek (1992)). Finally, this research makes use of data gathered from firms that are traded on the U.S. stock exchanges to draw conclusions. Due to the fact that similar extensive data is not available from other countries, formed the decision to make use of U.S. traded firms. However, as different regulation surrounding insider trading can be present, for these results to be generalized to different countries, country-specific regulation and data has to be used.

Though each research contains many different limitations, I sincerely hope to contribute to current academic research to the fullest extent.

8.0 - Bibliography

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9.0 – Appendix

Companies in the sample	
3COM CORP	LUCENT TECHNOLOGIES INC
ADVANCED FIBRE COMM INC	MANOR CARE INC
APOGENT TECHNOLOGIES INC	MANPOWERGROUP
APPLIED INDUSTRIAL TECH INC	MARTIN MARIETTA MATERIALS
APPLIED MICRO CIRCUITS CORP	MASCO CORP
ASHWORTH INC	MASSEY ENERGY CO
AUTONATION INC	MASTEC INC
AVID TECHNOLOGY INC	MATTEL INC
BJ'S WHOLESALE CLUB INC	MCDONALD'S CORP
BLYTH INC	MCKESSON CORP
BRIGGS & STRATTON	MDC HOLDINGS INC
BRIGHTPOINT INC	MEDIMMUNE INC
BRINKER INTL INC	MENTOR GRAPHICS CORP
BRISTOL-MYERS SQUIBB CO	METTLER-TOLEDO INTL INC
BRUNSWICK CORP	MICROS SYSTEMS INC
CABOT CORP	MICROSOFT CORP
CALLAWAY GOLF CO	MILLER (HERMAN) INC
CAMBREX CORP	MILLER INDUSTRIES INC/TN
CARLISLE COS INC	MILLER INDUSTRIES INC/TN
CARPENTER TECHNOLOGY CORP	MINERALS TECHNOLOGIES INC
CATALINA MARKETING CORP	MOHAWK INDUSTRIES INC
CATERPILLAR INC	MOODY'S CORP
C-COR INC	MUELLER INDUSTRIES
CDI CORP	MURPHY OIL CORP
CENTURYLINK INC	MYERS INDUSTRIES INC
CEPHALON INC	NASH FINCH CO
CERNER CORP	NATIONAL INSTRUMENTS CORP
CHECKFREE CORP	NATURES SUNSHINE PRODS INC
CHECKPOINT SYSTEMS INC	NAUTICA ENTERPRISES INC
CHEESECAKE FACTORY INC	NAVIGANT CONSULTING INC
CHESAPEAKE ENERGY CORP	NEW ENGLAND BUSINESS SVC INC
CHIRON CORP	NEWELL BRANDS INC
CHURCH & DWIGHT INC	NEWFIELD EXPLORATION CO
CIENA CORP	NEWMONT MINING CORP
CINTAS CORP	NEWPARK RESOURCES
CIRRUS LOGIC INC	NL INDUSTRIES
CITRIX SYSTEMS INC	NORDSON CORP
CLARCOR INC	NORDSTROM INC
CLOROX CO/DE	NORFOLK SOUTHERN CORP
COCA-COLA CO	NORTHROP GRUMMAN CORP
COHERENT INC	NUCOR CORP
COLE NATIONAL CORP	OCCIDENTAL PETROLEUM CORP
COLGATE-PALMOLIVE CO	OCEANEERING INTERNATIONAL
COMMERCIAL METALS	OFFICE DEPOT INC
COMMONWEALTH INDUSTRIES INC	OLIN CORP
COMPUTER TASK GROUP INC	OM GROUP INC
COMVERSE TECHNOLOGY INC	OMNICARE INC
CONAGRA BRANDS INC	OMNICOM GROUP
COOPER TIRE & RUBBER CO	OREGON STEEL MILLS INC
CORNING INC	OWENS & MINOR INC
COSTCO WHOLESALE CORP	OXFORD INDUSTRIES INC
COVANCE INC	PACCAR INC
CRANE CO	PALL CORP
CSG SYSTEMS INTL INC	PAREXEL INTERNATIONAL CORP
CSX CORP	PARK ELECTROCHEMICAL CORP
CTS CORP	PARKER DRILLING CO
CURTISS-WRIGHT CORP	PARKER-HANNIFIN CORP
CVS HEALTH CORP	PAYCHEX INC
CYPRESS SEMICONDUCTOR CORP	PENFORD CORP
CYTEC INDUSTRIES INC	PENNEY (J C) CO
D R HORTON INC	PENNZOIL-QUAKER STATE CO
DANAHER CORP	PEP BOYS-MANNY MOE & JACK
DARDEN RESTAURANTS INC	PEPSICO INC
DATASCOPE CORP	PERKINELMER INC

DAVITA INC	PETSMART INC
DEERE & CO	PFIZER INC
DELTA & PINE LAND CO	PHARMACEUTICAL PROD DEV INC
DELUXE CORP	PHOTRONICS INC
DIAGNOSTIC PRODUCTS CORP	PIER 1 IMPORTS INC/DE
DIGI INTERNATIONAL INC	PIONEER NATURAL RESOURCES CO
DIONEX CORP	PITNEY BOWES INC
DISNEY (WALT) CO	PLANTRONICS INC
DOCUMENTUM INC	PLAYTEX PRODUCTS INC
DONALDSON CO INC	PLEXUS CORP
DOVER CORP	POLARIS INDUSTRIES INC
DST SYSTEMS INC	PPG INDUSTRIES INC
DU PONT (E I) DE NEMOURS	PRAXAIR INC
EASTMAN CHEMICAL CO	PRECISION CASTPARTS CORP
ECOLAB INC	PROCTER & GAMBLE CO
ELECTRO SCIENTIFIC INDS INC	PROGRESS SOFTWARE CORP
ELECTRONICS FOR IMAGING INC	PSS WORLD MEDICAL INC
EMC CORP/MA	PULTEGROUP INC
EMERSON ELECTRIC CO	QUAKER CHEMICAL CORP
ENNIS INC	QUALCOMM INC
EOG RESOURCES INC	QUEST DIAGNOSTICS INC
EPICOR SOFTWARE CORP -OLD	QUESTAR CORP
EQUIFAX INC	RALCORP HOLDINGS INC
EVANS & SUTHERLAND CMP CORP	RATIONAL SOFTWARE CORP
EXPEDITORS INTL WASH INC	REEBOK INTERNATIONAL LTD
EXXON MOBIL CORP	REGIS CORP/MN
FAMILY DOLLAR STORES	REPUBLIC SERVICES INC
FASTENAL CO	RESPIRONICS INC
FEDERAL SIGNAL CORP	ROBBINS & MYERS INC
FEDEX CORP	ROCKWELL AUTOMATION
FERRO CORP	ROHM AND HAAS CO
FILENET CORP	ROPER TECHNOLOGIES INC
FISERV INC	ROSS STORES INC
FLORIDA ROCK INDUSTRIES INC	RSA SECURITY INC
FLOWSERVE CORP	RTI INTL METALS INC
FMC CORP	RUBY TUESDAY INC
FOREST LABORATORIES -CL A	RYLAND GROUP INC
FRANKLIN COVEY CO	SAFEWAY INC
FRONTIER OIL CORP	SAKS INC
FUEL CELL TECHNOLOGIES LTD	SAPIENT CORP
GENERAL DYNAMICS CORP	SCHEIN (HENRY) INC
GENERAL ELECTRIC CO	SCHULMAN (A.) INC
GENERAL MILLS INC	SCHWEITZER-MAUDUIT INTL INC
GENESCO INC	SCOTTS MIRACLE-GRO CO
GENTEX CORP	SEACOR HOLDINGS INC
GILEAD SCIENCES INC	SEALED AIR CORP
GLATFELTER	SEPRACOR INC
GOODRICH CORP	SEROLOGICALS CORP
GOODYEAR TIRE & RUBBER CO	SHERWIN-WILLIAMS CO
GRACO INC	SIGMA-ALDRICH CORP
GRAINGER (W W) INC	SKYLINE CHAMPION CORP
GRANITE CONSTRUCTION INC	SKYWEST INC
GRIFFON CORP	SKYWEST INC
GUIDANT CORP	SMITH INTERNATIONAL INC
GUITAR CENTER INC	SNAP-ON INC
HAEMONETICS CORP	SOLECTRON CORP
HAGGAR CORP	SONIC CORP
HALLIBURTON CO	SONOCO PRODUCTS CO
HARRIS CORP	SOUTHWEST AIRLINES
HARSCO CORP	SPARTAN MOTORS INC
HASBRO INC	SPEEDFAM-IPEC INC
HEALTH MANAGEMENT ASSOC	ST JUDE MEDICAL INC
HEARTLAND EXPRESS INC	STANDARD MOTOR PRODS
HECLA MINING CO	STANDEX INTERNATIONAL CORP
HELMERICH & PAYNE	STAPLES INC
HENRY (JACK) & ASSOCIATES	STARBUCKS CORP
HERCULES INC	STILLWATER MINING CO
HNC SOFTWARE INC	STRIDE RITE CORP
HOLLYWOOD ENTERTAINMENT CORP	STRYKER CORP
HOLOGIC INC	SUPERIOR INDUSTRIES INTL
HOME DEPOT INC	SWISS ARMY BRANDS INC
HONEYWELL INTERNATIONAL INC	SYMANTEC CORP
HORMEL FOODS CORP	SYMMETRICOM INC
HUGHES SUPPLY INC	SYNOPSYS INC
HUMAN GENOME SCIENCES INC	TALBOTS INC

HUNT (JB) TRANSPRT SVCS INC	TALK AMERICA HOLDINGS INC
HUTCHINSON TECHNOLOGY INC	TECH DATA CORP
I2 TECHNOLOGIES INC	TECHNOLOGY SOLUTIONS CO
IDEX CORP	TEJON RANCH CO
IDX SYSTEMS CORP	TEJON RANCH CO
IGATE CORP	TEKELEC
IKON OFFICE SOLUTIONS	TELEFLEX INC
ILLINOIS TOOL WORKS	TELLABS INC
IMC GLOBAL INC	TENET HEALTHCARE CORP
IMMUNEX CORP	TENNANT CO
INFORMATION RESOURCES INC	TERADYNE INC
INNOVEX INC	TERRA INDUSTRIES INC
INTEGRATED DEVICE TECH INC	TEXAS INDUSTRIES INC
INTEL CORP	TEXAS INSTRUMENTS INC
INTERMAGNETICS GENERAL CORP	THERMO FISHER SCIENTIFIC INC
INTERPUBLIC GROUP OF COS	THOMAS & BETTS CORP
INTL BUSINESS MACHINES CORP	THOR INDUSTRIES INC
INTL FLAVORS & FRAGRANCES	TIFFANY & CO
INTL PAPER CO	TITAN INTERNATIONAL INC
INTL RECTIFIER CORP	TITANIUM METALS CORP
IOMEGA CORP	TJX COMPANIES INC
ITRON INC	TOLL BROTHERS INC
J & J SNACK FOODS CORP	TOPPS CO INC
JABIL INC	TORO CO
JACOBS ENGINEERING GROUP INC	TREDEGAR CORP
JLG INDUSTRIES INC	TRINITY INDUSTRIES
JOHNSON & JOHNSON	TRINITY INDUSTRIES
KANSAS CITY SOUTHERN	TUPPERWARE BRANDS CORP
KB HOME	ULTRATECH INC
KELLOGG CO	UNION PACIFIC CORP
KELLWOOD CO	UNISYS CORP
KENNAMETAL INC	UNITED TECHNOLOGIES CORP
KFORCE INC	UNIVERSAL CORP/VA
KIMBERLY-CLARK CORP	UNIVERSAL FOREST PRODS INC
KIRBY CORP	UNOCAL CORP
KLA-TENCOR CORP	USG CORP
KMG CHEMICALS INC	VALASSIS COMMUNICATIONS INC
KNIGHT-RIDDER INC	VALSPAR CORP
KROGER CO	VARCO INTERNATIONAL INC
KRONOS INC	VARIAN MEDICAL SYSTEMS INC
KULICKE & SOFFA INDUSTRIES	VERITAS DGC INC
LABORATORY CP OF AMER HLDGS	VERIZON COMMUNICATIONS INC
LAFARGE NORTH AMERICA INC	VF CORP
LAM RESEARCH CORP	VINTAGE PETROLEUM INC
LANCASTER COLONY CORP	VITAL SIGNS INC
LANDRYS RESTAURANTS INC	VITESSE SEMICONDUCTOR CORP
LANDSTAR SYSTEM INC	VIVUS INC
LATTICE SEMICONDUCTOR CORP	VULCAN MATERIALS CO
LAWSON PRODUCTS	WABASH NATIONAL CORP
LA-Z-BOY INC	WABTEC CORP
LEARNING TREE INTL INC	WALMART INC
LEGATO SYSTEMS INC	WATERS CORP
LEGGETT & PLATT INC	WD-40 CO
LEVEL 3 COMMUNICATIONS INC	WEIS MARKETS INC
LIBBEY INC	WERNER ENTERPRISES INC
LILLIAN VERNON CORP	WEST PHARMACEUTICAL SVSC INC
LILLY (ELI) & CO	WESTERN GAS RESOURCES INC
LINCARE HOLDINGS INC	WHIRLPOOL CORP
LINCOLN ELECTRIC HLDGS INC	WILLIAMS COS INC
LINDSAY CORP	WILLIAMS-SONOMA INC
LINEAR TECHNOLOGY CORP	WINNEBAGO INDUSTRIES
LITTELFUSE INC	WOLVERINE WORLD WIDE
LOCKHEED MARTIN CORP	WORTHINGTON INDUSTRIES
LONE STAR TECHNOLOGIES	XEROX CORP
LONGS DRUG STORES CORP	XILINX INC
LONGVIEW FIBRE CO	X-RITE INC
LOUISIANA-PACIFIC CORP	XTO ENERGY INC
LOWE'S COMPANIES INC	YORK INTERNATIONAL CORP
LUBRIZOL CORP	ZALE CORP