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A Test Of The Pecking Order Theory: An Empirical Study Of Institutional And Insider Ownership Identities On The Swedish Market.

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Abstract

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Keywords:	Capital structure, Pecking order theory, institutional ownership identity, Insider ownership identity, Financing decision.
Purpose:	The paper investigates the financing behavior of firms listed on the Stockholm Stock Exchange (SSE) main markets using the pecking order theory. The study also examines the influence of institutional and insider ownership identities on the financing decisions of the firms.
Methodology:	Quantitative approach is employed to interpret the results from a panel data set.
Theoretical framework:	Pecking order theory, ownership identity theory
Empirical foundation:	A sample of 107 firms with time period 2009-2017
Conclusions:	We conclude that the pecking order theory of corporate financing is consistent with firms listed on the SSE main market. It was observed that tax shield has positive influence on firms' leverage. However, we found no significant evidence of the influence of both institutional and insider ownership identities in this study. This observed relationship raises the question of whether institutional owners optimally perform the disciplinary and monitoring roles.

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1. Introduction

This chapter provides a background to the study and reports the problematization, purpose and research questions.

1.1 Background

Capital structure decisions remain one of the vital aspects of corporate financing research. This is because optimal capital structure enhances growth and development ([1]Kumar, Colombage & Rao, 2017). Firms can employ the right financing vehicle to raise the needed capital for their investments. Thus, financing decisions heavily affect firms' performance and as such, an important tool for competitive advantage and overall survival. However, financing decisions are influenced heavily by players both within and outside the organization. According to Michaely and Vincent (2012) institutional investors can exert considerable influence on firms through monitoring. [2]Vishny and Shleifer (1986) identified that large shareholders such as institutional investors have the incentive to monitor companies effectively. This could also cause the so-called free rider problem where smaller investors ride on the monitoring which are enforced by the institutional owners.

Also, it is believed that higher institutional stock ownership will have a positive influence on corporate disclosure practices (Ajinkya, Bhojraj & Sengupta, 1999). Chung and Zhang (2011) found that shares held by institutional investors increases as the quality of governance structure increases. The logic behind this is that disciplinary pressure imposed through better corporate governance, acts as substitute for debt (Jensen, 1986). Insider ownership has the potential of aligning the interest of managers and outside shareholders due to their stake in the firm. Therefore, in an attempt to achieve optimal capital structure in the midst of shareholder influence, theories are developed to enhance effective and efficient financing decisions. The celebrated Modigliani and Miller (1963) theory on trade off assumes that there are optimal capital structures by trading off the benefits and cost of debt and equity. However, the pecking order theory assumes that there is no target capital structure as postulated by the trade-off theory. The pecking order is developed

[1] For a more recent and comprehensive research on corporate structure determinants, see Kumar, Colombage & Rao 2017).
[2] For a more comprehensive survey of corporate governance, see Shleifer and Vishny (1997).

on a hierarchy, determined by a company's preference for internal financing over external financing as a result of information asymmetry between firms and the capital markets. Myers (1984) describes the pecking order hypothesis as the priority of choosing an appropriate means of financing to reduce the problem of under-investment caused by information asymmetry. Hence firms prefer internal financing to external financing and if they must obtain external financing, firms prefer debt over equity. According to Myers and Majluf (1984), the problem of information asymmetry can be resolved if a firm resort to its available internally generated cash flows to finance it investment opportunities. Therefore, a firm should retain enough financial "slack" in order to finance internally when needed.

1.2 Problematization

The recent shift in the relationship between firms and shareholders has gained much significance both in literature and in practice. Monks and Minow (2001) share the opinion that the rate at which corporations grow, have widened the gap between owners and agents. Thomsen and Pedersen (2000) also identified that firm's investment decisions are highly influenced by various ownership identities who have different incentives and objectives.

Therefore owner-managers (insider owners) divert free cash flow into negative net present value projects and in consumption of excessive perquisites. Hence, low investment opportunistic insiders may prefer obtaining pecuniary and non-pecuniary private benefits of overinvestment instead of disbursing free cash to shareholders. Moreover, the availability of free cash flow may limit the appetite for external funds, thereby making unscrupulous insiders less exposed to market discipline and thereby more prone to empire building. Therefore, cash flow for investments is directly related to agency problems because of the insiders' propensity to engage in "pet projects" at the expense of outside shareholders (Jensen, 1986; Stulz, 1990).

Again, Jiang, Kim and Pang (2011) found a negative association between control-ownership wedge and investment sensitivity, suggesting that insiders' incentives for private control benefit reduce their propensity to listen to the market and that the negative impact of wedge on investment sensitivity is primarily driven by sub-optimal investments. Generally, they provide evidence that

agency problem is an important factor that determines the learning from the stock market in capital allocation.

The relationship between ownership type and firm-level capital allocations as captured by the sensitivity of investment expenditure to investment opportunities has also been examined and concluded that information asymmetry and agency problems affect institutional ownership thereby increasing investment inefficiency/efficiency (Chen, El Ghoul & Guedhami, 2017). It was revealed that ownership type plays very important role in determining firms' investment behavior and efficiency (Chen, El Ghoul & Guedhami, 2017).

According to Vintila and Gherghina (2015) there exists a negative influence of insider shareholdings and employees' organizations ownership on firm value. Harford, Li and Zhao (2008) consistently showed that higher optimal levels of cash, leads to inefficient capital investment and less valuable firms when internal governance mechanisms are not sufficiently effective to preserve shareholders' interests. Although the nexus of financing decisions and the influence of institutional and insider ownership identities have been broadly investigated in academia, not much is studied on the Swedish market. Apparently, no study has been made, to the best of our knowledge, the influence of institutional ownership identity and insider ownership identity on the pecking order theory of financing.

1.3 Purpose of study

In this paper, we study the financing behavior of firms by testing the pecking order theory on the Swedish market between the years 2009 – 2017. Secondly, we investigate the influence of institutional and insider ownership identities in predicting the financing behavior of Swedish firms.

Studying the financing behavior of the Swedish market is inspired by the unique characteristics of its corporate governance which is different from other countries. Typically, Swedish companies have few owners which results in dominance in controlling ownership. As a result, the various owners may have influence on the firms' financing decisions. According to Svensson, Wood and Callaghan (2006) power rest on shareholders within the Swedish corporate governance mechanism. Coffee Jr. (2005) revealed that ownership structure that is vested in few owners with different preferences and influences can result in severe agency problems. With the Swedish

corporate governance system, board of directors who are appointed by the shareholders exist to enhance adherence to corporate governance mechanisms in the firms. Jansson and Larsson-Olaison (2010) opined that the power of board of directors is quite phenomenal to the extent of hiring and firing management. This suggests the monitoring nature of the governance mechanism which is interesting to investigate.

Hence, we seek to contribute to literature since we believe, to the best of our knowledge, this is the first study to investigate the relationship between ownership identity and firms' financing behavior on the Swedish market as predicted by the pecking order theory.

1.4 Research question

To test the pecking order model and the influence of institutional and insider ownership identities, we are guided by the research questions below:

- Is the pecking order theory of corporate financing evident on the Swedish market?
- Does institutional ownership identity and insider ownership identity influence the pecking order of financing in Swedish listed firms?

2. Theory and Empirical studies

This chapter discusses the theories relevant to our study and introduces results from previous empirical studies. The logic is to provide basic understanding of the theories underlying the topic under study. The theories and previous empirical studies will form the basis for our hypotheses and further discussion and analysis of results.

2.1 General Pecking order theory

Pecking order theory is based on the premise that external capital (debt and equity) will always be relatively costly as compared to internal capital (retained earnings) due to the information asymmetry problems between firms and outside investors about firm's true value (Meyers & Majluf, 1984; Greenwald, Stiglitz & Weiss, 1984). According to Myers and Majluf (1984) information asymmetry will lead to a miss-pricing of a firm's equity in the market, resulting in a loss of wealth for existing shareholders. This loss in wealth is due to adverse selection problem as managers are deemed to be more knowledgeable than outside investors. In consequence, issuance

of new securities to finance new projects might be underpriced. This is not only because of lack of prospective investors' trust in them but also the difficulty on the part of managers to credibly convince them as to the quality of their existing assets and available investment opportunities (Myers & Majluf, 1984). As a result, it becomes less possible for potential investors to draw a line between good and bad projects thereby sending a wrong signal to outsiders. The firm's decision to issue new securities might be misconstrued as possible sign of bad news (financial distress) and then pricing new securities accordingly. Consequently, potential investors will demand a premium on their investments or firm will issue equity but at a discount.

Mindful of the resulting dilution of current shareholders' wealth, firms may not issue new equity even for projects with positive net present values, thereby leading to the so-called underinvestment problem. Myers and Majluf (1984) proposed that less risky debt instruments enable firms to mitigate the inefficiencies in their investment decisions caused by the information asymmetry problem. Compared to equity, debt is likely subject to lower degree of miss-valuation or adverse selection problems because debt contracts are considered safer and limit the extent to which holders could lose. Myers (1984) describes pecking order as managers' preferences in funding sources which covers their financing needs. Managers prefer internal financing to external financing, and, when there are insufficient internal funds, debt financing is preferred to equity financing as shown in the Figure 1.

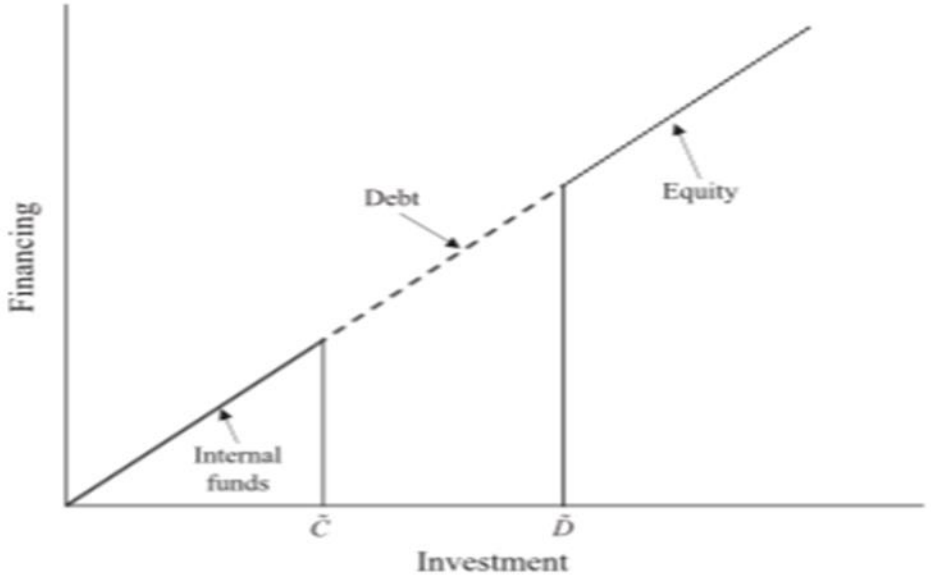

Figure 1: Financing hierarchy
Source: Leary & Roberts, (2010)

The Figure 1 above shows the financing hierarchy in the pecking order theory. The figure depicts the relationship between financing choices and the level of investment under the pecking order hypothesis. C represents the amount of internal funds available for investment. The region between C and D represents the amount of debt that a firm can issue without producing excessive leverage. Any investment needs above D means a firm will resort to equity financing. It is even more severe if the firm issues equity because the difference between management's valuations of the project as against the market's valuation is fully reflected in the price that the market is willing to pay for the issued security (equity). In some instances, management may reject a profitable project if it must be financed with external equity, with surrender cost exceeding the project's net present value (NPV). Issuing risky debt is ranked a priority to equity so that differences in management's and market's valuation of a debt security should be smaller. Therefore, should external financing be considered, debt is preferred to equity since its less costly. Avoiding external financing altogether by using internal financing is idle to escape giving away value to the markets. Hence, for firms to be able to pursue profitable projects at any time without resorting to external financing there is the need for financial slack (internal funds) always.

There have been several criticisms on the pecking order model. The suggestion that, the need for external funds is solely driven by insufficient internal funds is questionable. This is because the pecking order theory ignores other theories and the impact of institutional factors that might affect the firm's choice of financing some of which include interest rate, borrower-lender relations and government interventions (Adedeji, 1998). According to Cull and Xu (2005) ploughing back firm's profit into some large-scale projects sometimes depends on availability of external funds. In effect, investments become bumpy and therefore require both internal and external funds to fund the available profitable projects. Again, cost of borrowing becomes relatively cheaper than that of internal funds especially during financial crisis because of government intervention through favorable monetary policies. In consequence, firms prefer debt to internally generated funds for investment.

Similarly, transaction and information costs are not the sole factors for not wanting to use external financing in general and equity for that matter but rather, considerations to control rights might prevent firms from issuing equities due to their impact on the prevailing balance of control, or even to issue debt because of stringent debt covenants and restraints of the capital market (Baskin 1989; Allen, Morris & Postlewaite, 1993; Adedeji, 1998).

Consistent with this, Jensen and Meckling (1976) stated that firms rely on internally generated funds because of separation of ownerships and control. Thus, managers are unwilling to raise funds externally to avoid the capital market discipline. Supporting these arguments, Fazzari et al. (1988) tested the sensitivity of investment to the availability of cash flow and enumerated transaction costs, agency costs and asymmetric information costs as the main sources of costs hierarchy which inspire firms to follow the pecking order theory instead.

2.2 Previous Study on Pecking Order Theory

[3]According to Bhama, Jain and Yadav (2016) the pecking order theory is an excellent descriptor for deficit firms, but a poor one for surplus firms. The deficit firms normally issue debt to fill up deficiency requirements but keep their debt ratios in limit. However surplus firms have low debt

[3] A summary of previous research on pecking order theory is shown in appendix 5.

to equity ratios and only occasionally redeem debt. They tend to retain funds for future expansion and other operational needs.

The study results of Burgstaller and Wagner (2015) showed that family firms, whether controlled by founders or not, are relatively more leveraged. Therefore, the purpose of maintaining long-term control and limited financing options are vital to the observed differences in leverage. It is believed that capital structure decisions are not as a result of generational changes in agency costs. Leverage in total does not differ between founder and descendant-controlled family firms respectively. However, firms with a founder-chief executive officer (CEO), adjust faster to deviations from a target debt ratio. Even though there are differences in effects between various proposed capital structure determinants across firm types, they are highly consistent with predictions from the pecking order theory.

Investigating 'Debt financing and firm performance on Swedish SMES, Yazdanfar and Öhman (2015) used three-stage least squares (3SLS) and fixed-effects models to analyze a comprehensive, cross-sectoral sample of 15,897 Swedish SMEs operating in five industry sectors during the 2009-2012 period. The study revealed that as high debt ratio seems to increase the agency costs and the risk of losing control of the firm, SME owners and managers tend to finance their businesses with equity capital to a higher extent, a situation which is directly opposite of the pecking order theory.

Similarly, Leary and Roberts (2010) quantified the empirical relevance of the pecking order hypothesis using a novel empirical model. In addressing previous empirical concerns, the test revealed that while the classificatory ability of the pecking order varies significantly, pecking order does not observe financing decisions. However, when other variables were added to the model, it gave some meaningful results with significant accuracy. The predictive accuracy of the model increases dramatically, precisely classifying over 80% of the observed debt and equity issuances. It however revealed that pecking order behavior is driven by incentive conflicts rather than information asymmetry.

Sjögren and Zackrisson (2005) examined how high technology small firms (HTSFs) in Linköping, Sweden and Santa Clara County, USA are financed and their preferences for different financial

sources. It was shown that the pecking order is different for HTSFs than for larger firms. Thus, the HTSFs prefer equity financing. The paper also revealed that the dichotomy between HTSFs in Linköping and Silicon Valley are believed not to be the reason for the variances in explaining pecking order but rather difficulties in accessing funds.

In examining some of the empirical inferences of the pecking order theory on the Spanish market, Sanchez-Vidal and Martin-Ugedo (2005) used a panel data to analyse 1,566 firms between the period 1994 and 2000. The results revealed that the pecking order theory explains subsamples better, notably for small and medium-sized enterprises and for the high growth and highly leveraged companies. The authors observed that firms finance their funds flow deficits with long term debt.

Furthermore, Frank and Goyal (2003) tested the pecking order theory of corporate leverage on a broad cross-section of publicly traded American firms spanning from 1971 to 1998. The result revealed that net equity issues track the financing deficit more closely than net debt issues, a result considered divergent from the pecking order theory. Though large firms exhibited some aspects of pecking order behavior, the evidence was neither robust to the inclusion of conventional leverage factors, nor to the analysis of evidence from the 1990s.

2.3 Ownership Identity

Thomsen and Conyon (2012), state that ownership structure in publicly listed firms entails two distinct features. That is ownership concentration signifying firms' ownership by one or few large owners (concentrated) or by multiple smaller owners (diffused/ dispersed) and ownership identity, referring to the type of owners. Firms ownership structure is therefore made up of different types of owners(identity) who have different incentives and objectives with investments decisions as well as the level of commitment (Thomsen & Pedersen, 2000).

In a classic paper by Berle and Means (1932) the authors made a scenario of shareholding pattern. It was predicted that managers in big corporations will have more powers in diffused shareholding as compared to concentrated shareholding. The incentive by individual shareholders to monitor the actions of managers will be reduced and managers with less ownership right in such

corporations will not act in a manner that will increase the value of the firm. In effect, too much ownership dispersion will result in agency problems due to lack of control right among individual shareholders who are highly fragmented. In diffused shareholding with less monitoring, managers, in an attempt to avoid external monitoring will fund investments with internal cash flows (Jensen, 1986).

As a means of averting this canker, a more direct way to align cash flow and control right is concentrated ownership/ shareholding (Shleifer & Vishny, 1997). Concentrated voting right has the tendency to put pressure on managements' performance. Managers conform to the aggression of such large shareholdings by taking strategic financing decisions which conform to the shareholders interest. For investment purposes, debt financing is preferred by large shareholders, especially in capital investment since such does not carry voting or control right beyond the need to servicing the debt covenants.

2.4 Previous Research on Ownership Identity

[4]Wang and Shailer (2018) concluded that there is stronger positive relationship between private ownership-performance and institutional/foreign ownership in contrast with family/management ownership. Moreover, it was shown that while there is a weak negative relationship between government ownership and performance, private ownership and performance is strong and positive over time, thereby leading to the proposition that there is solid and dynamic kind of relation between ownership and performance in emerging markets.

Similarly, Boubaker, Derouiche and Nguyen (2015) examined the effect of ownership structure on the use of cash flow in financing corporate investments and showed that investment-cash flow sensitivity decreases with controlling shareholders' cash-flow but positively related with cash flow and control rights. It was also shown that firms are less probable to use cash flow in investments when shareholders' controlling interests are allied with those of minority shareholders'. Furthermore, preferably internal funds are used for investments when serious agency problems arise due to excessive shareholder controlling rights.

[4] A summary of previous research on ownership identity is shown in appendix 5.

Kang and Kim (2015) explored reasons behind the difference in the impact of the ownership cash flow rights and voting rights of corporates' soft asset investment decisions in large business groups in South Korea. Their study revealed negative association between the ownership discrepancy and the level of investments in intangibles and human resources. Higher shareholders voting rights lead to additional motivations to reduce firms' investments necessary for successful long-term strategic opportunistic view against minority shareholders' rights.

Moreover, the sensitivity of firm's capital investment to its cash flow decreases when the cash-flow rights of its largest shareholders increase. However, it was also showed that this sensitivity increases when the degree of deviation between the control rights and cash-flow rights of the firm's largest shareholders increases. The results which are in accordance with the free cash-flow hypothesis claim that "too much free cash flow in the hands of entrenched managers is likely to lead to overinvestment". They however found their results to be predominantly true especially for firms with largest shareholders' control rights instead of cash-flow rights and with lower profitability (Wei & Zhang, 2008).

Ozkan and Ozkan (2004) explore the empirical determinants of corporate cash holdings for a sample of UK firms by focusing on the importance of managerial ownership among other corporate governance attributes such as board structure and corporate controllers. They found that ownership structure of firms is a very significant determinant of cash holdings of UK companies, and that there exists an active relationship between managerial ownership and cash holdings. It is also found that cash holdings initially decrease as managerial ownership increases up to 24%, then rises as managerial ownership increases to 64%, and subsequently falls at higher levels of managerial ownership. The dominance effect of managerial ownership position over the entrenchment effects is suggested to be possible reason for the observed trend.

Similarly, Berger and Humphrey (1997) in their study of relationships between managerial entrenchment and firms' capital structure theories argued that leverage decreases managerial discretion. Thus, optimal amount of debt will not be issued unless management is threatened with disciplinary measures. They showed that firms' leverage is impacted by the extent of managerial entrenchment where entrenched managers largely avoid debt. In the same manner, by examining

cross-sectional relations between leverage levels and corporate governance variables, they showed that leverage is lower, not only when the CEO has a prolonged tenure of office and has weak stock and compensation incentives, but also when the CEO does not face severe monitoring by board of directors or major stockholders.

2.5 Swedish Context

The Corporate governance system of the Swedish market is best described by the Anglo-Saxon systems where banks often hold substantial number of shares in their clients' firms. These banks are usually considered house banks for large companies which are similar to many other Continental European countries (Angblad, Högfeldt & Svancar, 2002). There exist financial families who control large portion of the firm's shares or with large blockholings companies worth half the market value of the stock exchange. According to Angblad, Högfeldt and Svancar (2002), the Stockholm Stock Exchange market is very liquid and both market capitalization and turnover per capita levels are among the highest in Europe. The equity on which the control is based is thinner in Sweden than in other European economies. The Swedish governance setting has more concentrated ownership structure as compared to the USA and other economies which are more diluted. (Angblad, Högfeldt & Svancar, 2002).

Families are also allowed by law to control large companies as a result of the pyramid holdings and the dual-class shares. Family firms have low investment inefficiencies due to low agency problems (Pindado, Requejo & De La Torre, 2011). The free rider problem associated with diffused ownership is mitigated in the presence of large shareholders through effective monitoring (Shleifer and Vishny, 1992). Pyramidal ownership is one that allows majority stakes for small group of investors in one company as well as allows large stake control in several other companies. Holmén & Högfeldt (2009) argue that pyramid-controlled firms make cash flow inexpensive within the internal capital market for shareholders who own higher control rights than cash flow rights. In Wallenberg for example, the power is tied to share holdings by a family foundation at the top of the pyramid.

Dual-class share on the other hand, allows shareholders to have control in a firm without a proportionate ownership stake in its capital. It is referred to as the strongest anti-takeover provision in Sweden (Angblad, Högfeldt & Svancar, 2002). Both classes of shares have the same right to

dividends, but the voting rights are allowed to be 10 times higher for A-shares (up to 1000 times higher for shares issued in the past (Angblad, Högfeldt & Svancar, 2002). According to La Porta, Lopez-de-Silanes and Shleifer (1999) Sweden is among the few countries which operate these two systems. Angblad, Högfeldt & Svancar (2002) stated that the legal systems which gives voting power and capital contribution undermine the minority shareholder's protection and causes abuse even though, in the history of the Swedish corporate governance, there are just a few of such violations. The entire ownership on the stock exchange is dominated by few controlling owners. Applying the Swedish system to the pecking order theory, we argue that due to higher concentration of ownership, the level of monitoring is high, and that management financing behavior is controlled by these large shareholders. By this, we predict a heavy influence by the ownership structure of firms in Sweden on the firm's decision to use internal financing or external financing. It can be argued that large firms are likely to use debt financing to fund investment activities due to such repercussions that put restrictions on management to prevent the pursuit of the so-called pet projects. Equity financing would not be a preferred option since the Swedish system does not encourage ownership dilution.

As stated earlier, firm's ownership structure is made up of [5]different types of identities with different incentives and objectives as well as the level of commitment (Thomsen & Pedersen, 2000). These incentives and objectives affect firm's financing decisions. In this paper, we focus on the institutional ownership and insider ownership identities and their impact on the firms' financing decisions using the pecking order theory. These ownership identities and expected relationships on firms' leverage are discussed below;

2.5.1 Institutional ownership Identity

Institutional investors generally are those owners who focus on capital investments. These investors manage huge portfolios which distinguishes it from the other types of ownership. As a result of the large portfolio of investment, investors consciously monitor the firms (Grinstein & Michaely, 2005). This revealed preference for control, relative to growth is quite consistent with an institutional environment which makes it very risky to aim at rapid growth with a regulatory

[5] The ownership structure of a firm is categorized into two main categories; concentrated/diluted and ownership identities. This research focuses on the ownership identity categories. More specifically, institutional and insider ownership identities.

package penalizing individual wealth accumulation where the opportunity cost for foregoing growth is lowered. Institutional investors become increasingly unwilling to accept dual-class shares, thereby putting pressure on listed firms to reduce the differential between cash-flow and control rights.

Jensen (1986) argued that institutional ownership and firm leverage are positively related. Due to high level of monitoring by these institutional owners, managers are restricted on the use of free cash flows. As a disciplinary measure, managers are pressured by these institutional owners to take on more debt while dividend payout ratio increases.

Even though the Swedish setting limits institutional owners influence in firms, it is expected that these owners will take active role in disciplining and monitoring management to prevent self-serving behavior. Moreover, institutional ownership does not only comprise of Swedish indigenes but also abroad whose influence may affect management investment behavior. We therefore predict a positive relationship between institutional ownership identity and changes in debt. Our hypothesis is that;

H1: Ceteris paribus, there is positive relationship between institutional ownership identity and changes in debt of the firm.

2.5.2 Insider Ownership

Demsetz and Villalonga (2001) used the number of corporate shareholdings by members of the board, CEO and other management as the basis to determine insider ownership. Enormous research has been done on the influence of insider ownership on capital structure especially on how it relates to corporate performance. In an article by Jensen and Meckling (1976) it was argued that such firms do not obtain optimal capital structures. Managers in a quest to succeed, reduce the level of external monitoring, thereby entrenching their position. Three hypotheses were developed from previous research on the relationship between insider ownership and corporate performance.

According to Morck, Shleifer and Vishny (1986) the hypothesis includes convergence of interest hypothesis, irrelevance hypothesis and the entrenchment hypothesis. The convergence of interest hypothesis assumes that the higher the managerial ownership, the more likely the interest of

managers and outside shareholders will be aligned such that, managers are more likely to operate firms with the purpose of value creation rather than pursuing own interests. Higher insider ownership will therefore induce management to pursue investment with positive Net present values which will enhance profitability and prevent management from pursuing costly external financing (Jensen & Meckling 1976). This hypothesis is consistent with empirical studies (e.g. La Porta, Lopez-de-Silanes & Shleifer, 2000; Sheu & Yang, 2005; Harford, Li & Zhao, 2008).

Secondly, the irrelevance theory propounded by Fama (1980) was based on 'nexus of contracts' perspective. Under this hypothesis, ownership structure intuitively affects agency cost as supported by several empirical studies (Jensen & Meckling, 1976; Ang, Cole & Lin, 2000).

Finally, the entrenchment hypothesis is based on the behavior of managers to pursue their own interests at the expense of outside shareholders. When inside ownership is above a certain level, securing approval from Board of Directors on major decisions is easier even at the expense of outside shareholders. When managerial compensation is not aligned to performance; managerial entrenchment towards external sources of capital increases (Berger & Humphrey, 1997).

Managers hold less cash when their ownership stake is high since it serves as an incentive to receive equity compensation. This can reduce free cash flow related issues (Ozkan & Ozkan, 2004). In other dimensions, insider ownership and internal cash flow posit a positive relationship. Ozkan and Ozkan (2004) established the fact that ownership stake between (24 – 64) % of managers causes an increase in retained earnings. According to the researchers, cash levels increase with managers who already hold huge stake in their firms. Insider owners gain strong resistance to monitoring by the other outside shareholders and therefore gains maximum control of the firm. Due to less monitoring as a result of entrenchment, the disciplinary measures to take on more debt decreases which posit a negative relationship between firms' leverage and insider ownership.

H2: Ceteris paribus, there is a negative relationship between insider ownership identity and changes in debt of the firm.

2.6 Pecking order theory and ownership identity in the Swedish market

As explained earlier, the pecking order theory which assumes three hierarchy of financing options is subject to adverse selection problems which makes debt and equity riskier for investors. This cost incentivizes risk premium on both debt and equity and makes external financing costly for firms to pursue Myers (1984). Hence, firms would prefer internal financing to avoid such cost. When internal funds are exhausted, firms resort to debt financing since debt is less costly than equity. Equity financing is used as a last resort. However, profitable firms tend to rely more on internal funds as compared to distress firms. Also, larger firms, as a result of their huge array of investment opportunities may exhaust internal funds and resort to external financing. Therefore, it is empirically proven that deficit financing is the best predictor of the evidence of pecking order (Shyam-Sunder and Myers (1999). In the presence of institutional and insider ownership identities, pecking order of firms financing decision is expected to be influenced. Firms are expected to follow the pecking order of financing decisions with an insider ownership influence. Insiders may pursue activities within the organization to favor their interest. However, they would prefer internal financing to avoid external monitoring. When internal funds are exhausted, insider owners choose debt over equity to avoid sharing ownership. The Swedish market is characterized by family owners who entrench their stake without a chance to dilute ownership. Presumably, pecking order will be consistent with firms with insider ownership influence which may not be the case for institutional owners. On the other hand, institutional role of monitoring and disciplining management may be a contributing factor to the pecking order prediction. However, firms are forced, as a disciplinary and monitoring measure by institutional owners to take on debt. This action may enhance management's performance in a quest to service debt to prevent bankruptcy proceedings (Jiang, Kim and Pang, 2011). Therefore, institutional and insider ownership identities is expected to influence the pecking order of financing decisions on the Swedish market.

3. Methodology

This chapter explores the methodology of the work. We begin by describing the sampling techniques employed in the study. We further explain the motivation behind the time frame chosen and the component of the variables used in this study. We explore the reliability and validity of this study. The econometric strategy and the method used in the study are described and finally, we show some few limitations we encountered during the study.

3.1 Sample

Included in this study are Swedish firms listed on the NASDAQ OMX Stockholm Stock Exchange market from 2009 to 2017. [6]Out of a total sample of 225 firms, financial institutions (53 firms) were excluded[7] from participation due to strong regulation in their industry, consistent with other empirical studies (e.g. Anderson & Reeb, 2003; Sraer & Thesmar, 2007; Bach, 2010; Isakov & Weisskopf, 2012). Firms domiciled in countries other than Sweden (18 firms) were also excluded to enhance comparability in the study. Data availability is the main criteria employed in selecting the sample. Consequently, 47 firms were excluded as a result of incomplete data. Based on these criteria, a total of 117 firms were excluded leaving 107 firms for the study. Appendix 3 shows the summary of sector classification and number of listed sample firms on the Nasdaq Stockholm Stock Exchange. This classification is based on the listings on Nasdaq Nordic Markets as at 2017 (Nasdaq-Nordic, 2017).

3.2 Time Frame

The time frame for this study spans from 2009 – 2017. Our choice of this time frame is motivated by the fact that the period reflects an increase in returns on the Stockholm stock exchange main markets after the global economic crunch in 2008 as seen in the Figure 1 below. Firms listed on the market, within this period recorded profits which imply increases in internal cash flow. An increase in internal cash flow influences a firm's decision to use internal financing or external financing[8] (Fama, 2002). By this we anticipate a decrease in leverage within the period under study due to the high levels of internally generated cash flows, consistent with previous empirical study (Titman and Wessels, 1988; Friend and Lang, 1988; Rajan and Zingales, 1995). The chart below illustrates the positive trend of returns on the SSE main market between 2009 and 2017. This also indicates well-performing firms and possible optimism of investors.

[6] A summary of the number of firms used as well as firms excluded are captured in appendix 4. We have included information about the various industries used in this study.

[7] We exclude financial firms due to strong regulations and different way of reporting which differ from other industries. Including such firms may cause inconsistencies in our result. This approach is consistent with previous empirical studies, see (e.g. Anderson and Reeb, 2003; Sraer and Thesmar, 2007; Bach, 2010; Isakov and Weisskopf, 2012)

[8] Previous research on capital structure theory have found that profitable firms which have more internal funds use less leverage, see (Fama and French, 2002; Frank and Goyal, 2005; Friend and Lang, 1988; Rajan and Zingales, 1995; Titman and Wessels, 1988)

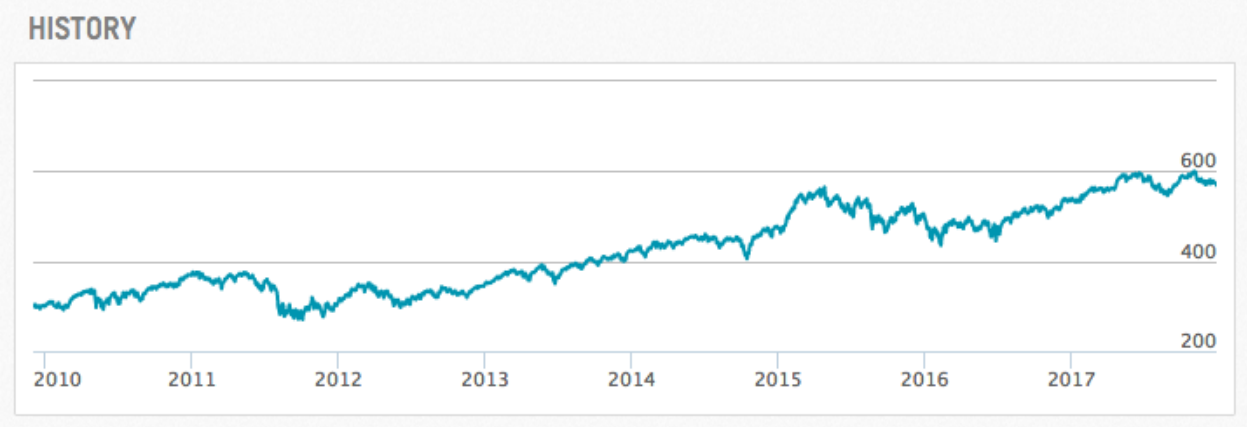

Figure 2: OMXSPI Index 2009 - 2017

Source: NASDAQ OMX Nordic (2018)

3.3 Model Specification

3.3.1 The Pecking Order Model

The external debt financing as predicted by the pecking order model is driven by the internal financing deficit unlike the traditional tradeoff theory which predicts firm's adjustments towards optimal debt ratio. From the standpoint of the firm, retained earnings are better source of financing as compared to debt financing and equity in that particular order (Frank & Goyal, 2003).

The pecking order model shows a relationship between the changes in debt and financing deficit as a result of the firm's investment needs and internally generated funds. This prediction is based on whether debt or equity is used to fill the financing deficit. The financing deficit will match the net debt issues since firms will prefer issuing debt rather than equity to address their financing deficit. Shyam-Sunder and Myers (1999) argued that, except for firms at or near their debt capacity, the pecking order predicts that the deficits will be filled entirely with new debt issues. The specification by Shyam-Sunder and Myers (1999) estimates changes in debt on deficit financing as shown in equation (1);

$$\Delta D_{it} = \beta_0 + \beta_1 \Delta DEF_{it} + \varepsilon_{it} \qquad (1)$$

$$DEF = DIV + I + \Delta W + R - C \qquad (2)$$

The equation (2) above represents the accounting definition of deficit financing suggested by (Shyam-Sunder & Myers, 1999). Therefore, in an attempt to specify the pecking order model in equation (1), Frank and Goyal (2003) identified that the current portion of long-term debt (R), does not define deficit financing according to accounting integrity[9]. This is consistent with other empirical studies (Ni & Yu, 2008; Dedes, 2010). In removing the component of R, the equation becomes:

$$DEF_{it} = DIV + I + \Delta W - C = \Delta D + \Delta E \qquad (3)$$

Table 1: Definition of deficit financing

Variable	**Definition of variables**
ΔE_{τ}	net equity issued in year t (sale of common stock minus stock repurchases)
ΔD_{T}	net debt issued in year t (long-term debt issuance –long-term debt reduction)
DIV_{T}	Cash dividends in year t
I_t	net investment in year t (capital expenditures + increase in investments +acquisitions + other use of funds – sale of investment)
ΔW_{τ}	change in working capital in year t (change in operating working capital + change in cash and cash equivalents + change in current debt)
C_t	cash flow after interest and taxes (income before extraordinary items + depreciation and amortization + extraordinary items and discontinued operations + deferred taxes + equity in net loss – earnings + other funds from operations + gain (loss)
R	Current portion of long-term debt in year t

Equation (3) becomes the accounting cash flow identity according to (Frank & Goyal, 2003). We follow the conventional model suggested by Frank and Goyal (2003) in our regression to specify

[9] Frank & Goyal, (2003) argue that current portion of long-term debt component in the definition of deficit financing in an attempt to predict the pecking order theory punishes the accounting integrity and may bias the empirical result. See also Jinlan et al, (2008) and Farhat et al, (2009)

changes in debt on five variables: Tangibility of assets (T), market-to-book ratio (MTB), log of sales (LS) and profitability (P) and deficit financing (DEF) as shown below;

$$\Delta D_{it} = \beta_0 + \beta_1 \Delta T_{it} + \beta_2 \Delta MTB_{it} + \beta_3 \Delta LS_{it} + \beta_4 \Delta P_{it} + \beta_5 \Delta DEF_{it} + \varepsilon_{it} \qquad (4)$$

[10]To further enhance the validity of the model, we estimate the original pecking order model without the ownership structure models. This approach will enable us to test the pecking order model on the Swedish market to address the first aim of this research work. We then add the [11]institutional and insider ownership identity variables to the original pecking order model to obtain their influence on firms' decision to use it internally generated cash flow or external funding for investment purposes. This will also address the second motive of this research work. We control for tax shield and industry dummies to check the impact of these variables on the model. A final model is then obtained as specified below;

Model 1

The first model represents the pecking order which regresses changes in debt on five factors such as tangibility, market-to-book, log sales, profitability and debt financing.

$$\Delta D_{it} = \beta_0 + \beta_1 \Delta T_{it} + \beta_2 \Delta MTB_{it} + \beta_3 \Delta LS_{it} + \beta_4 \Delta P_{it} + \beta_5 \Delta DEF_{it} + \varepsilon_{it}$$

Model 2

In model 2, we add institutional and insider ownership identity variables into our original model to assess their influence on the model.

$$\Delta D_{it} = \beta_0 + \beta_1 \Delta T_{it} + \beta_2 \Delta MTB_{it} + \beta_3 \Delta LS_{it} + \beta_4 \Delta P_{it} + \beta_5 \Delta DEF_{it} + \beta_6 Insider_{it} + \beta_7 Institutional_{it} + \varepsilon_{it}$$

[10] Since our primary aim is to examine the pecking order theory on the Swedish market, we specify the model suggested by Frank & Goyal (2003).

[11] Secondly, we seek to analyze the influence of institutional ownership identity and insider ownership identity. Therefore, adding these variables is expected to achieve our aim.

Model 3

We control for tax shield in model 3 to observe the performance of the model in predicting changes in debt.

$$\Delta D_{it} = \beta_0 + \beta_1 \Delta T_{it} + \beta_2 \Delta MTB_{it} + \beta_3 \Delta LS_{it} + \beta_4 \Delta P_{it} + \beta_5 \Delta DEF_{it} + \beta_6 Insider_{it} + \beta_7 Institutional_{it} + \beta_8 Tax\ shield + \varepsilon_{it}$$

Model 4

We apply industry dummies in model 4 to see the significance of the various industries in predicting changes in debt. This also represents our final model.

$$\Delta D_{it} = \beta_0 + \beta_1 \Delta T_{it} + \beta_2 \Delta MTB_{it} + \beta_3 \Delta LS_{it} + \beta_4 \Delta P_{it} + \beta_5 \Delta DEF_{it} + \beta_5 Insider_{it} + \beta_6 Institutional_{it} + \beta_8 Tax\ shield + \beta_6 Industry\ dummy + \varepsilon_{it}$$

3.3.2 Description of Variables

- *Dependent variable*

Brooks, (2008) defines dependent variable as one which is the center of measurement and depends on other factors. The pecking order theory as suggested by Frank & Goyal (2003) estimates changes in debt on five components. Therefore, our dependent variable is changes in debt.

- *Explanatory variables*

According to Brooks (2008) explanatory variables explain the behavior of the dependent variable. With the primary aim of examining the pecking order model of corporate financing on the Swedish market, we follow the model of Frank and Goyal (2003) to test the influence of market-to-book, tangibility, profitability, firm size and deficit financing on our dependent variable (changes in debt). These components are suggested to explain the financing choices of internal funds and external funds as predicted by the pecking order model (Titman & Wessels, 1988)

In an attempt to address the second purpose of our study, we employ institutional ownership identities and insider ownership identities as our explanatory variables. It is empirically proven

that ownership structure has explanatory power on firms' financing decisions (e.g. Ozkan & Ozkan, 2004). Ownership identity variables are obtained from Capital IQ and reported to be constant over the period under review[12]. Other previous study on ownership identities report similar happenings (e.g. La Porta, Lopez-de-Silanes & Shleifer, 1999; Ozkan & Ozkan, 2004). Ozkan & Ozkan (2004) stated that, there is no expected significant bias in result since equity ownership structure of firms in a country is relatively stable over a certain period of time. We analyze [13]all explanatory variables as below:

- *Tangibility*

According to Harris and Raviv (1991) under the pecking order theory, asymmetric information is prevalent in firms with few tangible assets. Therefore, debt accumulation will be extreme in such firms and become highly levered. Other studies such as (Hall, 2012; Berger, Frame & Ioannidou, 2011; Almeida & Campello 2007) revealed tangibility and leverage relationship in different ways and came out with different answers as to the direction of the association. Hence, Harris and Raviv argue that the pecking order predicts that $T < 0$. This may not be the conventional prediction of the role of tangibility. The collateral hypothesis is a more common idea in predicting leverage. All things being equal, tangible assets are most invariably used as collateral. Hence, collateral is associated with increased leverage. Therefore, the usual prediction is that $T > 0$. According to the pecking order theory, there will be positive relationship between tangibility and changes in debt. Tangibility is defined as the ratio of property, plant and equipment to total assets.

$$Tangibility = \frac{PPE}{TA}$$

- *Market-to-book*

Firms with high market-to-book ratios are seen to have more future growth opportunities. According to Myers (1977), debt could limit a firm's ability to seize such opportunities when they

[12] The ownership identity data we retrieved from Capital IQ showed constant figures over the years under study. Therefore, we found this consistent with previous empirical studies. See also (La Porta et al. 1999; Ozkan & Ozkan, 2004)

[13] This include variables for both pecking order model and ownership identity including dummy variables.

appear. Goyal, Lehn & Racic (2002) found that when growth opportunities of firms decline, these firms increase their use of debt financing. This is motivated by the fact that managers would rely on internal financing when growth opportunities are high to avoid signaling effect by the external environment (Frank & Goyal, 2008). The relationship can also be positive since implementing major projects with high growth will be costlier and unavoidable which may force firms to seek external financing at a point where internal financing is exhausted (Myers, 1977; Serrasqueiro & Caetano, 2015). Therefore, according to the pecking order theory, it is expected that there will be a negative/ positive relationship between growth opportunities and changes in debt. The market-to-book ratio is measured as the total book value assets minus total shareholder equity plus the market value of equity (share price multiplied by outstanding shares) divided by the total book value of assets (Opler et al., 1999).

$$MTB = TA - TSE + \frac{MVE}{TA}$$

- *Firm size*

Large firms are usually more diversified with better reputations in the debt markets. These firms face lower information costs in borrowing. Therefore, large firms are predicted to have more debt in their capital structures. Hence larger firms are most likely to fund investment activities with external financing due to low level of cash flow these firms keep (López-Gracia & Sogorb-Mira 2008; Vătavu, 2012). Smaller firms on the other hand, resort to internal financing due to lack of access to external financing due to costly external financing and low reputation. Therefore, we predict both negative and positive relationship between firm size and changes in debt according to pecking order theory. We compute firm size by the natural logarithm of net sales.

$$Size = ln(NS)$$

- *Profitability*

According to the pecking order theory, a firm will prefer internal finance but would issue debt finance when internal finance is exhausted and then issue new equity as the last resort in the presence of information asymmetry. It is therefore expected that profitability and financial

leverage will have a negative relationship. Myers (1984) argue that profitable firms are more likely to have retained earnings which presupposes that successful firms do not depend heavily on external finance. This is consistent with the empirical evidence of Kayo and Kimura (2010) which suggest that firms will finance their investment opportunities with internally generated cash flow instead of debt. Similarly, several empirical studies have given credence to the inverse relationship between corporate returns and leverage (Delcoure, 2007; George & Hwang, 2010; Kayo & Kimura, 2011; Korkmaz, 2016). However, several studies found a positive relationship between leverage and profitability and showed that returns increase with leverage (Bhandari 1988; Brav, 2009). Therefore, we expect a positive or negative relationship between profitability and changes in debt. We compute profitability as EBITDA/ Net sales in this study.

$$Profitability = \frac{EBITDA}{Net\ sales}$$

- *Institutional ownership*

According to Harford, Li and Zhao (2008) institutional shareholders are the percentage of shares held by institutions. Hedlunds (1985) classifies institutional owners as investment firms, insurance companies, foundations/ trust, pension funds, societies/ associations and other firms which invest in companies. The variable is extracted directly from the company ownership data through Capital IQ.

Institutional = % of total outstanding voting rights owned by the controlling institution

- *Insider ownership*

This variable is a percentage of the total outstanding voting right owned by the controlling insider or individual. In other words, the percentage of votes corresponding to shares held by directors and officers as a group (Griner & Gordon, 1995). Data is extracted directly from Capital IQ.
Individual/ Insider = % of total outstanding voting rights owned by the controlling insider

- *Tax Shield*

According to Modigliani and Miller (1963), firms undertake debt financing as a result of the tax deductions associated with debt. Since an increase in debt also increases a firms' after-tax earnings,

it serves as motivation in taking on more debts. In studying the impact on the choice of debt and equity, MacKie-Mason (1990) concluded that changes in marginal tax rate affect firms' financing decisions. Graham (2000) argues that firms become more levered, given the tax benefits of debt. We therefore control for tax shield to check it influence on the model. It is expected that tax shield will positively affect changes in debt and improve the explanatory power of the model.

- *Industry*

Swedish Standard Industrial Classification (SNI) is based on EU's recommended standard NACE Rev.2 which is primarily an activity classification (Statistiska Centralbyrån, Sweden). For this study, the classification of the industry follows the NASDAQ Nordics Markets 2017 which is made up of a heterogeneous range of industry sectors such as Industrials, Technology, Consumer Goods, Consumer Services, Health Care, Oil & Gas, Telecommunication and Basic Materials. Financials (Financial Institutions) are excluded due to their strict regulations as explained earlier. Industry is a categorical variable, and therefore can be treated as dummies taken the values 1 or 0, consistent with previous research (Yazdanfar et al, 2015). Eight industry dummies are created representing each of the sectors within the industry[14], consistent with (Cassia and Vismara, 2009). In general, more industries behave in a manner consistent with perking order theory (Ghosh & Cai 1999).

Table 2: Variables and expected signs

Variables	**Expected signs**
Institutional Ownership	+
Insider Ownership	-
Tangibility (T)	+
Market-to-book (MBV)	-
Firm size (LS)	-/ +
Profitability (P)	-/ +
Tax shield	+
DEF	+

[14] Dummy variables are tabulated in appendix 4

3.3.3 Reliability and validity

The ability for results in a research work to be replicated, given the same data, signifies the validity of the research work (Bryman, Bell & Nilsson 2005). This makes reliability an issue of great importance in research. Using secondary data raises an issue of possible reliability problem. Hence, we see the problem of reliability modest with our thesis since data were all gathered from Capital IQ which is considered trustworthy.

Validity on the other hand, also presses the knot of relevance in research. According to Bryman, Bell and Nilsson (2005) the adequacy and legitimacy of variables used in the study to measure the intended purpose signifies the validity of the variables. Our research work is based on previous research which justifies the validity of our thesis.

3.4 Econometric Strategy

In order to empirically achieve the purpose of this research work, multiple regressions are run. This will unearth the significant relationship between our dependent variable and set of explanatory variables to enhance analysis and discussion (Wooldridge, 2009). To capture clearly the differences in the models specified above, we first run model 1 to test for the pecking order theory. Secondly, we introduce institutional ownership and insider ownership to obtain the impact of the ownership identities on the Swedish market using the pecking order model. All data are scaled by firm's total assets which has been proven empirically as being the best method in controlling for firm size (e.g. Shyam-Sunder & Myers, 1999; Seifert & Gonenc, 2012; De Jong, Verbeek & Verwijmeren, 2011).

3.4.1 Method description

The estimation technique adopted for our analysis is Panel Ordinary Least Squares. To overcome the econometric problem of heterogeneity and autocorrelation, we find the first difference of all our models as suggested by (Newey, Rosen & Holtz-Eakin, 1988; Wooldridge, 2009). To achieve unbiased and consistent estimates of our coefficients, OLS estimator becomes more efficient. As a diagnostic test, the study performs test for heterogeneity and heteroskedasticity using the Breusch-Pagan/Cook-Weisberg test. The correlation matrix is also utilized to check for possible

multicollinearity between explanatory variables whiles Durbin Watson Statistic test is used for Serial autocorrelation (AC) check are as shown in appendix 1 and 2[15].

3.5 Limitation of study

Although this study presents interesting results, we are still aware of its limitations and shortcomings. Access to ownership data saw challenges since several attempt to gain access to the Swedish National Database yielded no results. The idea was to study both ownership concentration and ownership identity. Therefore, lack of access to the Swedish database limited our study to only ownership identities.

Secondly, the sample size is relatively small as more than half of the available data were excluded as a result of incomplete data and strict regulations within other sectors as explained early on. This makes results generalization somewhat problematic. Too small, a sample size would make statistical tests not able to identify significant relationships within data set. Larger sample size could have generated more accurate results as sample size is of greater importance in quantitative studies.

[15] The Breusch-Pagan/Cook-Weisberg test in the output results in Appendix 1 and 2 indicates that the problems of Heterogeneity/ Heteroskedasticity /Multicollinearity/ Serial autocorrelation (AC) others have been largely eliminated. Breusch-Pagan/Cook-Weisberg test as per the test: Chi2(1), equals 0.18, 0.90; and Prob>chi2 0.6690 and 0.3430 for the pecking order and final models respectively. Durbin Watson, on the average 2.7 is greater than 2, across board which means there is no autocorrelation. The correlation coefficients are less than 0.8 and it cuts across all the models, an indication of absence of multicollinearity.

4. Results

We present the results of the regression models in this chapter. The chapter begins with descriptive statistics which is preceded by the regression models.

4.1 Descriptive statistics

Table 3 shows the descriptive statistics of the data used in our analysis. The mean of -45.44 registered by changes in debt suggest that on average, firms over the years under study have reduced dependency on external debt probably due to lack of collateral and reputation. Interestingly the standard deviation of 1972.134 seems large and indicates that the data on change in debt are more widely spread but negatively skewed. This means that many firms in Sweden are small and medium firms who depend on internally generated funds or equity as compared to external financing. This is confirmed by the negative mean of 2108.801 of deficit financing which suggest that there is enough funds for these small and medium size firms perhaps due to financial slack or conservative usage. Also, tax shield hovers around the mean of 0.219044.

The average firm enjoys sales of SEK8.265million, a minimum of SEK2.26million and a maximum of SEK12.292million. The distribution of the sales is also not much widely spread from the mean by SEK1.181million, signaling that the firms are not that dissimilar in terms of sales and perhaps size. The industry is dominated by smaller firms. Thus, it is not surprising that the profitability of firms has been averagely negative and negatively skewed with -0.770056 and -23.9322 respectively. That notwithstanding tangibility and market-to-book recorded means of 0.151055 and 9.619061 and standard deviation of 0.174582 and 28.23895 respectively; indicating a high propensity to take on more secured debts.

Institutional and insider ownership identities accounted for a mean of 45.45726 and 8.130117, with a standard deviation of 17.24601 and 11.70222 respectively. The various industries in Sweden are coded into dummies of 0 and 1. In all, there are eight (8)[16] industries made up of consumer goods, consumer services, health care, industrials, oil and gas, technology, telecommunication and

[16] See appendix 4

basic materials. On average, Swedish industry is dominated by industrials with the highest mean of 0.38176 followed by health care and consumer services.

Table 3: Descriptive statistics

	Mean	Median	Maximum	Minimum	Std. dev	Skewness	Kurtosis	Observation
Change_in_debt	-45.4397	-1.3	14075	-25711	1972.134	-1.117362	50.20309	926
Tangibility	0.151055	0.093606	0.895538	0.000565	0.174582	2.122058	7.884541	918
MTB	9.619061	1.879766	229.747	-46.77307	28.23895	6.070756	48.62331	903
LN _NS	8.265439	8.200315	12.92998	2.261763	1.811876	0.024498	3.139151	918
Profitability	-0.770056	0.109008	292.1921	-1236.053	43.7327	-23.93223	700.0654	917
DEF	-2108.801	-373.55	16831.4	-57249.5	5934.005	-4.221171	26.24919	932
Insider	8.130117	2.4	50.7	0	11.70222	1.939911	6.389144	943
Institutional	45.45726	44.9	87.1	2.1	17.24601	0.035351	2.606712	943
Tax_Shield	0.219044	0.186879	2.768712	0	0.222032	3.288438	29.38918	918
Consumer_Goods	0.134677	0	1	0	0.341559	2.140288	5.580834	943
Consumer_Services	0.14316	0	1	0	0.350422	2.037711	5.152264	943
Health Care	0.150583	0	1	0	0.357832	1.954002	4.818123	943
Industrials	0.38176	0	1	0	0.486765	0.486765	1.23694	943
Oil_Gas	0.009544	0	1	0	0.097278	10.08897	102.7874	943
Technology	0.104984	0	1	0	0.306696	2.577315	7.642551	943
Telecommunication	0.019088	0	1	0	0.136907	7.029107	50.40835	943
Basic Materials	0.037116	0	1	0	0.189145	4.897081	24.9814	943

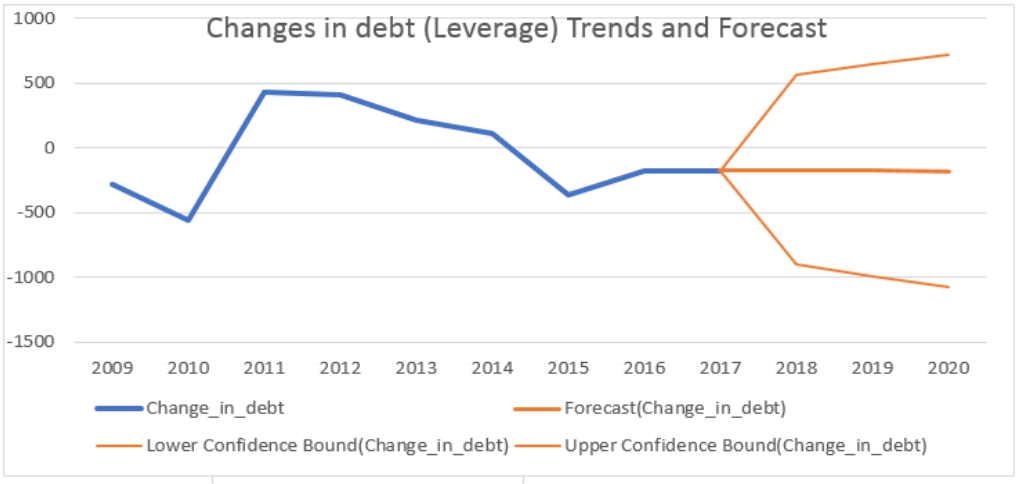

Figure 3: Trends of Changes in debt (Leverage)

Source: Authors diagram based on data from Capital IQ

The figure 1 above shows the trends in the changes in debt in the firms over the years under study. Debt issue decreased from 2009, perhaps due to the impact of the general economic crunch of 2008 which affected the propensity of firms to take on debt. A sharp rise within 2010-2012 mirrors the economic health and the credit integrity of the market after recovery from the global crunch. The market saw a steady fall over the years through to 2015 and early part of 2016, signaling an increase in internally generated cash flow due to profit generation as evidenced in figure 2. This has remained stable until date and it is forecasted to be stable over the steady forecast period.

Table 4: Regression results

	Model 1			Model 2			Model 3			Model 4		
	Large	Small	All	Large	Small	All	Large	Small	All	Large	Small	All
Dependent Variable	ΔChange_in_debt	ΔChange_in_debt	ΔChange_in_debt	ΔCHange_in_debt	ΔChange_in_debt	ΔCHange_in_debt	ΔCHange_in_debt	ΔCHange_in_debt	ΔCHange_in_Debt	ΔCHange_in_debt	ΔCHange_in_debt	ΔChange_in_debt
C	-97.19392	-1.251002	-7.996887	37.06497	-22.14089	-59.06287	-6.964176	-32.72561	-75.29475	-230.4162	-63.358	-33.52
	(0.5401)	(0.9108)	(0.9239)	(0.941)	(0.4976)	(0.815)	(0.9885)	(0.31)	(0.7772)	(0.6938)	(0.3629)	(0.3356)
Δ(Tangibility)	8950.296	404.2394	3793.379	8685.66	384.92	3724.755	9083.417	306.8051	3729.312	9305.3	282.8506	3324.577
	(0.1255)	(0.3317)	(0.2118)	(0.1397)	(0.3564)	(0.2217)	(0.1107)	(0.4551)	(0.2214)	(0.1051)	(0.497)	(0.2738)
Δ(MTB)	-44.52083	-2.13108	-33.7765	-45.33279	-1.826652	-33.80916	-32.62742	-836012	-33.65935	-35.18715	-0.593954	-33.12015
	(0.0115)**	(0.4867)	(0.0046)***	(0.0100)**	(0.5545)	(0.0047)***	(0.0580)*	(0.7839)	(0.005)***	(0.044)**	(0.8472)	(0.0056)***
Δ(LN_NS)	3320.549	88.61513	637.4798	3442.725	93.99291	651.4663	2129.291	117.4693	659.9831	2205.242	124.3088	815.704
	(0.0004)***	(0.0055)***	(0.0323)**	(0.0003)***	(0.0038)***	(0.0300)**	(0.0250)**	(0.0003)***	(0.0297)**	(0.0246)**	(0.0002)***	(0.0075)***
Δ(PROFITABILITY)	-3576.13	0.638733	0.222223	-3798.019	0.637214	0.221201	1165.042	0.648161	0.223455	1071.01	0.6602	0.41201
	(0.424)	(0.2698)	(0.9723)	(0.3986)	(0.2466)	(0.9725)	(0.7938)	(0.2552)	(0.9722)	(0.8104)	(0.2483)	(0.9484)
ΔDEF	0.110812	-0.037359	0.105154	0.110585	-0.036558	0.105212	0.112631	-0.030061	0.107426	0.114023	-0.0283	0.106579
	(0.0000)***	(0.2357)	(0.0000)***	(0.0000)***	(0.2466)	(0.0000)***	(0.0000)***	(0.3331)	(0.0000)***	(0.0000)***	(0.3651)	(0.0000)***
Insider				-8.711382	-0.32752	-1.451114	-5.012869	-0.296808	-1.520655	-2.722703	-0.358066	-0.939911
				(0.5093)	(0.7267)	(0.8326)	(0.8648)	(0.2314)	(0.825)	(0.8199)	(0.713)	(0.8962)
Institutional				-1.936601	0.538121	1.356471	1.608576	0.695086	1.377133	-2.548485	0.747001	1.084527
				(0.8423)	(0.3609)	(0.7755)	(0.6953)	(0.7473)	(0.7723)	(0.8423)	(0.2072)	(0.8962)
ΔTax shield							10190	196.3735	67.68849	10680.17	205.3785	1961.079
							(0.0000)***	(0.0003)***	(0.8465)	(0.0000)***	(0.0002)***	(0.0003)***
Consumer goods										966.4871	67.26184	688.5184
										(0.0787)*	(0.3462)	(0.0502)**
Consumer Services										510.0649	46.69868	337.229
										(0.3831)	(0.4890)	(0.3417)
Health Care										623.9132	12.25786	150.156
										(0.3849)	(0.8531)	(0.6718)
Industrials										279.3081	29.36768	227.3411
										(0.5698)	(0.6483)	(0.4658)
Oil_Gas										-1215.609	129.7082	159.8406
										(0.3915)	(0.3198)	(0.8473)
Technology										-242.507	16.21526	199.1385
										(0.9336)	(0.8047)	(0.5987)
Observations	396	365	761	396	365	761	396	365	761	396	365	761
R-squared	0.108478	0.037083	0.08245	0.109479	0.04029	0.82656	0.16763	0.07524	0.82702	0.180104	0.084304	0.104153
Prob(F-statistic)	0.000000	0.018195	0.000000	0.000000	0.038877	0.000000	0.000000	0.000459	0.000000	0.000000	0.004955	0.000000
F-statistic	9.490782	2.7651	13.56871	6.814307	2.141039	9.692595	9.742196	3.6206	8.47487	5.978061	2.301624	6.195102

Table 4 presents the regression results for each specified model and (*// ***, **, and * indicate that coefficient is significant at the 1%, 5% and 10% levels, respectively*). The first model represents the pecking order where changes in debt is regressed on the five independent variables such as Tangibility, profitability, MTB, firm size and deficit financing following Frank and Goyal, (2003). The regression had a coefficient of determination (R-squared) of 8,2 %, meaning, ceteris paribus, the variables describe 8,2 % of the changes in debt levels amongst firms under study. The pecking order model finds significant support for deficit financing with positive coefficient. This means that firms within our sample frame resort to debt financing due to the fact that internal funds are exhausted. Firm size is also significant with positive coefficient which implies that debt increases with firm size. Market-to-book is statistically significant with negative coefficient, signifying that firms have less future growth opportunities. Tangibility and profitability are statistically insignificant in explaining the changes in debt predicted by the pecking order theory.

In an attempt to better understand the reactions of the variables, we run a subsample regression of larger and smaller firms within our data. We find that the R-squared had improved within larger firms as 11% and decreased tremendously for smaller firms as 3.7%. This suggests that the independent variables have higher explanatory power within larger firms in Sweden as compared to smaller firms. Firm size (log sales) still remains significant at 1% level within larger firms and smaller firms in explaining changes in debt. Interestingly, we find deficit financing and market-to-book significant for large firms and insignificant in small firms. Significant in large firms, the DEF still shows a positive coefficient, signaling the fact that internal funds are exhausted. This suggest that larger firms heavily use their internal funds while smaller firms are conservative in using their internal funds, perhaps to prevent resorting to costly external financing (Jensen, 1986). Both profitability and tangibility variables are insignificant in predicting changes in debt in both large and small firms. MTB is significant in larger firms and statistically insignificant in smaller firms. The whole model for the smaller firms shows a weaker F-statistic mirroring a weaker model.

In model 2, we add the institutional and insider ownership identity variables to obtain their impact on the pecking order model in predicting changes in debt. R-squared is 83 % signifying an increase in explanatory power. We find no statistical significance for both institutional and insider ownership identities in explaining changes in debt, nevertheless the predicted signs on coefficients were achieved. Deficit financing (DEF) is significant at 1% level with positive coefficient. The

positive coefficient suggest that internal funds are exhausted Yueh-hsiang, (2008). Firm size is also significant with positive coefficient. MTB is statistically significant with negative coefficient. Tangibility and profitability are statistically insignificant in explaining the changes in debt as predicted by the pecking order theory. The subsample output shows an R-squared of 11% for larger firms and 4% for smaller firms with a weaker F-statistic. Both insider and institutional ownership identities are insignificant at all levels in predicting changes in debts.

In model 3, the control variable, tax shield was added in an attempt to increase the explanatory power of the model. Apparently, R-squared remains at 83 % which shows a strong explanatory power of the independent variables in explaining changes in debt. Tax shield is statistically significant for both larger and smaller firms, implying that tax shield influences changes in debt for both smaller and larger firms. DEF, MBT and firm size still remain statistically significant with predicted signs being achieved. Tangibility, profitability, Institutional and insider ownership identities remained statistically insignificant in explaining debt levels. We achieved an explanatory power of 17% for larger firms and 7.5% for smaller firms. The aim to strengthen the explanatory power was achieved for larger firms. We find DEF significant for larger firms but insignificant for smaller firms.

In the final model, we added industry dummies as control. We find that consumer goods dummy is significant at 5% level with the other industrial dummies statistically insignificant in explaining possible changes in debt. Interestingly, tax shield becomes highly significant at 1% level with a positive coefficient as predicted. This is contrary to the hypothesis of DeAngelo and Masulis (1980) but consistent with Graham (2000) who also finds positive relationship. DEF, MBT and firm size still remained statistically significant with predicted signs being achieved. Tangibility, profitability, Institutional and insider ownership identities are statistically insignificant in explaining debt levels when controlled with industry dummies. We obtain a final R-squared of 10.4 % which shows an increase in the explanatory power of the model. The R-squared is generally small which is explained by the first difference approach we used. The subsample regressions saw a tremendous increase in the explanatory power to 18% for larger firms and 8.4 for smaller firms. Tax shield remain statistically significant at 1% level in explaining changes in debt for both larger and smaller firms. We found consumer goods significant in explaining changes in debt. DEF and

MTB are significant in larger firms but insignificant in smaller firms. Firm size is also significant in both large and small firms.

5. Discussion of major findings

The table below summarizes the expected and observed relationships in the regression model 4. It shows whether the observed relationships are in line with hypothesis. As can be seen in the table below, all relationships were achieved. Hence this will form the foundation of our discussion.

Table 5: Expected and Observed relationships

Variables	Expected relationship	Observed relationship
Tangibility	+	+
Profitability	-/+	+
MTB	-	-
Firm_size	-/+	+
DEF	+	+
Institutional	+	+
Insider	-	-
Debt_tax_shield	+	+

5.1 Pecking order model

Our results show that all variables are in line with our expectations. Market-to-book, firm size and deficit financing are significant at 1%, 5% and 1% levels respectively. We found tangibility and profitability statistically insignificant in this study.

According to Michaelas, Chittenden and Poutziouris (1999) firms with high growth opportunities(MTB) are likely to exhaust internal funds and require additional capital. As we hypothesized, debt could limit a firm's ability to seize future growth opportunities when they appear. As a result, these firms make heavy use of their internally generated cash flow instead of external financing. Management become conservative and enforce financial slack to ensure adequate funds for future growth and investment opportunities. Nevertheless, this proxy does not

predict the leverage behavior of smaller firms in the market. Therefore, since smaller firms are known to be associated with heavy operational cost, funding is required coherently which discourages conservative spending. So, in effect, the leverage behavior of smaller firms will not depend on future opportunities but rather, other factors such as collateral and reputation. Consistent with Sjögren and Zackrisson (2005), these factors also make accessing external financing problematic for smaller firms in Sweden. This observed phenomenon is proven in our descriptive statistics by a negative mean for changes in debt.

With deficit financing, we find evidence that internal funds are exhausted and that firms resort to external financing. Our findings show that larger firms make heavy use of external financing while smaller firms make use of internally generated cash flows. Larger firms have large financing needs and that they will end up with high debt ratio due to managements' reluctance in issuing equity. Hence large firms within the Swedish context follow the pecking order prediction of financing hierarchy in this regard. The high level of information asymmetry within smaller firms and the quest to protect such firms from external forces make smaller firms prefer internal financing to external financing. As explained by Sanchez-Vidal and Martin-Ugedo (2005), the pecking order theory of corporate financing best describes the financing behavior of smaller firms and high growth firms.

According to the pecking order theory, the size of a firm significantly impact a firms' financing decision. Consistent with our findings, large firms in Sweden resort to external financing, perhaps due to their reputation and collateral security on the debt market. Previous research has identified that collateral is used in securing loans and minimizing information asymmetry (Hall, 2012; Berger, Frame, & Ioannidou, 2011). Almeida & Campello (2007) also assert that sustaining more external financing is dependent on adequate collateral.

5.2 Ownership identity

Grounded on the pecking order theory, we provide an argument of the influence of institutional and insider ownership identities on firms' financing decisions. We have argued that institutional owners force management to take on more debt as a way of monitoring against misallocation of funds and a means to enhance management performance. Insider ownership on the other hand has been argued to negatively respond to changes in debt. These owners who entrench their position

resist debt to avoid monitoring by external parties especially lenders. Therefore, financing decisions are impacted by ownership identities.

Interestingly, we find no statistical significance for both institutional ownership identity and insider ownership identity in our study. The result on insider ownership identity is consistent with the work of Mykhayliv and Zauner (2017) who also identified that insider ownership has no impact on investment of firms. The result on institutional ownership identity raises the question of whether institutional owners perform their monitoring and disciplinary roles. Hence the need for future research to investigate possible cause of this deviation.

5.3 Swedish context

The performance of the pecking order model in predicting the financing pattern in the Swedish market is evident even though profitability and tangibility deviate from prediction. The result suggests that firms in Sweden, within our sample frame, exhaust their internal funds, implying that firms resort to external financing when internal cash flows are exhausted as predicted by the pecking order theory. Firms in Sweden make use of their internally generated funds and resort to external financing when the need arises. In seeking external financing, firms prefer debt. We observed that, tax shield motivates firms in Sweden to rather prefer debt to equity. As a last resort, firms resort to equity financing. This is particularly prevalent among smaller firms who may have difficulties in accessing debt financing

Surprisingly, our test reveals that both institutional and insider ownership identities do not influence changes in debt of firms under study. What could possibly account for this?

A critical look into the trend of the Swedish governance system reveals that most institutions engage the services of external expertise who "feed" them with relevant information. Hence, the practice makes institutional owners less involved in the governance of firms they invest in. We observed that the Swedish regulation also limit the influence of institutions on firms, perhaps causing insignificant effect on the firms' leverage.

Again, the cost of monitoring could also be a contributing factor to the observed insignificant relationship between institutional ownership identity and firm leverage. Due to high level of

competition amongst institutional owners over customers, reducing administrative charges serve as a competitive advantage to attract more customers. Less administrative fees may reduce internal cash flow and make monitoring more expensive to pursue, hence little or no monitoring.

If our assumptions are right, then the low level of monitoring by these institutional owners may have accounted for our result on the insider owners. This stands to reason that insider owners have no pressure to take on debt and that, they may have the incentive to run the firm in a way that will be consistent with their interest. Kayhan (2008) posits that entrenched managers may retain cash rather than pay out earnings and therefore show preference for issue of equity over debt in a quest to maintain a conservative capital structure which improves their job security.

6. Conclusion

This paper presents empirical analysis of the pecking order model on the Swedish market based on data from 2009 - 2017. The study contributes to the empirical literature on capital structure and corporate governance in several ways; we provide evidence from the Swedish market where much study has not been made especially with the influence of institutional and insider ownership identities on firms' financing decisions. We also provide relevant information which will be of much importance to investors and companies in corporate financial decisions.

Future growth opportunities negatively affect firms leverage. Applying the pecking order theory, we can conclude that firms prefer internal financing to external financing. When internal capital is insufficient, debt is issued. Equity is issued as a last resort. This practice is suggested to mitigate external monitoring and enhance the firms' ability to take on debt to finance future growth opportunity as they occur.

Firm size positively impacts changes in debt. Larger firms are seen to be highly diversified with reputation on the debt market. Within the pecking order framework, larger firms which seek external financing for investment activities prefer debt to equity. This lies well on the pecking order prediction.

Tax shield is revealed to be significant in explaining why firms in Sweden take on debt. Large firms appear to take advantage of tax deductibility of debt. Therefore, large firms relatively take advantage to raise finance from institutions due to lower information asymmetry and lower risk.

In conclusion, the empirical evidence from this study shows that the pecking order theory predicts the financing behavior of firms in Sweden. Generally, internal financing is not sufficient to cover investment spending on average which gives need for external financing. Market-to-book, firm size and deficit financing are important variables that influence firms financing behavior in Sweden, consistent with the pecking order model. Therefore, our empirical test which suggests the evidence of the pecking order financing hierarchy on the Swedish market.

7. Future research

It is empirically proven that; institutional and insider ownership identities have a level of influence on the debt levels of firms. However, our result rather showed no significant relationship, raising questions about the role of ownership identity in monitoring management to deliver value for their investment. Observing the trends and possible reasons for such deviation on the Swedish market could be interesting.

Again, the Swedish governance system is characterized by large families who own large control in their firms (e.g. the Wallenberg family). This feature of the system makes the market highly concentrated as compared to US which is diluted. It would however be interesting to examine the impact of the financial families and their relationship to corporate leverage as well as a comparative analysis of the US and Swedish market.

Furthermore, our study observed a trend after the global economic crunch of 2008 which provided a good insight into the debt patterns of firms listed on the SSE main market. Future research may consider a study before and after the credit crunch to critically examine how the economy responded to corporate leverage.

Finally, we believe that larger samples can give a more generalized results. Testing the pecking order theory on the European market presumably, will give much more insight into the financing patterns of firms within the European continent.

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Appendices

Appendix 1

Model 1(Pecking Order) (All)

Dependent Variable: D(CHANGE_IN_DEBT)
Method: Panel Least Squares
Date: 05/21/18 Time: 19:15
Sample (adjusted): 2010 2017
Periods included: 8
Cross-sections included: 104
Total panel (unbalanced) observations: 761

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-7.996887	83.74334	-0.095493	0.9239
D(TANGIBILITY)	3793.379	3035.587	1.249636	0.2118
D(MTB)	-33.77650	11.88804	-2.841218	0.0046
D(LN_NS_)	637.4798	297.2824	2.144358	0.0323
D(PROFITABILITY)	0.222223	6.404403	0.034698	0.9723
D(DEF)	0.105154	0.013902	7.564117	0.0000

R-squared	0.082450	Mean dependent var	19.21170
Adjusted R-squared	0.076374	S.D. dependent var	2221.357
S.E. of regression	2134.846	Akaike info criterion	18.17803
Sum squared resid	3.44E+09	Schwarz criterion	18.21457
Log likelihood	-6910.740	Hannan-Quinn criter.	18.19210
F-statistic	13.56871	Durbin-Watson stat	2.940523
Prob(F-statistic)	0.000000		

Model 2 (All)

Dependent Variable: D(CHANGE_IN_DEBT)
Method: Panel Least Squares
Date: 05/21/18 Time: 19:20
Sample (adjusted): 2010 2017
Periods included: 8
Cross-sections included: 104
Total panel (unbalanced) observations: 761

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-59.06287	252.3432	-0.234058	0.8150
D(TANGIBILITY)	3724.755	3045.527	1.223025	0.2217
D(MTB)	-33.80916	11.92750	-2.834555	0.0047
D(LN_NS_)	651.4663	299.5829	2.174578	0.0300
D(PROFITABILITY)	0.221201	6.412302	0.034496	0.9725
D(DEF)	0.105212	0.013923	7.556873	0.0000
INSIDER	-1.451114	6.861342	-0.211491	0.8326
INSTITUTIONAL	1.356471	4.754182	0.285322	0.7755

R-squared	0.082656	Mean dependent var	19.21170
Adjusted R-squared	0.074128	S.D. dependent var	2221.357
S.E. of regression	2137.439	Akaike info criterion	18.18306
Sum squared resid	3.44E+09	Schwarz criterion	18.23178
Log likelihood	-6910.655	Hannan-Quinn criter.	18.20182
F-statistic	9.692595	Durbin-Watson stat	2.940206
Prob(F-statistic)	0.000000		

*Breusch-Pagan/Cook-Weisberg test for heteroskedasticity
Ho: Constant variance/Homoscedasticity
Variables: fitted values of D (CHANGE IN DEBT)
Chi2(1) = 0.18
Prob>chi2 = 0.6690

Large Firms

Dependent Variable: D(CHANGE_IN_DEBT)
Method: Panel Least Squares
Date: 05/21/18 Time: 20:20
Sample: 2009 2017 IF LN_NS >@MEDIAN(LN_NS ,"@all")
Periods included: 8
Cross-sections included: 63
Total panel (unbalanced) observations: 396

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-97.19392	158.4904	-0.613248	0.5401
D(TANGIBILITY)	8950.296	5829.213	1.535421	0.1255
D(MTB)	-44.52083	17.52553	-2.540342	0.0115
D(LN_NS_)	3320.549	926.1018	3.585512	0.0004
D(PROFITABILITY)	-3576.130	4468.666	-0.800268	0.4240
D(DEF)	0.110812	0.019235	5.761085	0.0000

R-squared	0.108478	Mean dependent var	25.83838
Adjusted R-squared	0.097048	S.D. dependent var	3075.552
S.E. of regression	2922.506	Akaike info criterion	18.81331
Sum squared resid	3.33E+09	Schwarz criterion	18.87363
Log likelihood	-3719.035	Hannan-Quinn criter.	18.83720
F-statistic	9.490782	Durbin-Watson stat	2.946824
Prob(F-statistic)	0.000000		

Large Firms

Dependent Variable: D(CHANGE_IN_DEBT)
Method: Panel Least Squares
Date: 05/21/18 Time: 20:28
Sample: 2009 2017 IF LN_NS >@MEDIAN(LN_NS ,"@all")
Periods included: 8
Cross-sections included: 63
Total panel (unbalanced) observations: 396

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	37.06497	500.5523	0.074048	0.9410
D(TANGIBILITY)	8685.660	5868.230	1.480116	0.1397
D(MTB)	-45.33279	17.60671	-2.574745	0.0104
D(LN_NS_)	3442.725	946.9273	3.635680	0.0003
D(PROFITABILITY)	-3798.019	4494.666	-0.845006	0.3986
D(DEF)	0.110585	0.019280	5.735900	0.0000
INSIDER	-8.711382	13.18914	-0.660496	0.5093
INSTITUTIONAL	-1.936601	9.730290	-0.199028	0.8423

R-squared	0.109479	Mean dependent var	25.83838
Adjusted R-squared	0.093413	S.D. dependent var	3075.552
S.E. of regression	2928.382	Akaike info criterion	18.82228
Sum squared resid	3.33E+09	Schwarz criterion	18.90272
Log likelihood	-3718.812	Hannan-Quinn criter.	18.85415
F-statistic	6.814307	Durbin-Watson stat	2.943160
Prob(F-statistic)	0.000000		

Small Firms

Dependent Variable: D(CHANGE_IN_DEBT)
Method: Panel Least Squares
Date: 05/21/18 Time: 20:18
Sample: 2009 2017 IF LN_NS <@MEDIAN(LN_NS ,"@all")
Periods included: 8
Cross-sections included: 60
Total panel (unbalanced) observations: 365

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.251002	11.15309	-0.112166	0.9108
D(TANGIBILITY)	404.2394	415.8369	0.972110	0.3317
D(MTB)	-2.131080	3.060821	-0.696244	0.4867
D(LN_NS_)	88.61513	31.73524	2.792326	0.0055
D(PROFITABILITY)	0.638733	0.577913	1.105241	0.2698
D(DEF)	-0.037359	0.031450	-1.187871	0.2357

R-squared	0.037083	Mean dependent var	12.02219
Adjusted R-squared	0.023672	S.D. dependent var	194.8178
S.E. of regression	192.4981	Akaike info criterion	13.37435
Sum squared resid	13302932	Schwarz criterion	13.43846
Log likelihood	-2434.819	Hannan-Quinn criter.	13.39983
F-statistic	2.765100	Durbin-Watson stat	2.807096
Prob(F-statistic)	0.018195		

Small Firms

Dependent Variable: D(CHANGE_IN_DEBT)
Method: Panel Least Squares
Date: 05/21/18 Time: 20:30
Sample: 2009 2017 IF LN_NS <@MEDIAN(LN_NS ,"@all")
Periods included: 8
Cross-sections included: 60
Total panel (unbalanced) observations: 365

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-22.14089	32.61277	-0.678902	0.4976
D(TANGIBILITY)	384.9200	416.7916	0.923531	0.3564
D(MTB)	-1.826652	3.087335	-0.591660	0.5545
D(LN_NS_)	93.99291	32.29033	2.910868	0.0038
D(PROFITABILITY)	0.637214	0.578577	1.101347	0.2715
D(DEF)	-0.036558	0.031502	-1.160498	0.2466
INSIDER	-0.327520	0.936278	-0.349811	0.7267
INSTITUTIONAL	0.538121	0.588176	0.914898	0.3609

R-squared	0.040290	Mean dependent var	12.02219
Adjusted R-squared	0.021472	S.D. dependent var	194.8178
S.E. of regression	192.7149	Akaike info criterion	13.38197
Sum squared resid	13258631	Schwarz criterion	13.46745
Log likelihood	-2434.210	Hannan-Quinn criter.	13.41594
F-statistic	2.141039	Durbin-Watson stat	2.816719
Prob(F-statistic)	0.038877		

Model 3 (All)

Dependent Variable: D(CHANGE_IN_DEBT)
Method: Panel Least Squares
Date: 05/21/18 Time: 19:23
Sample (adjusted): 2010 2017
Periods included: 8
Cross-sections included: 104
Total panel (unbalanced) observations: 761

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-75.29475	266.0474	-0.283013	0.7772
D(TANGIBILITY)	3729.312	3047.566	1.223702	0.2214
D(MTB)	-33.65935	11.96017	-2.814288	0.0050
D(LN_NS_)	659.9831	302.9821	2.178291	0.0297
D(PROFITABILITY)	0.223455	6.416415	0.034826	0.9722
D(DEF)	0.105199	0.013932	7.551021	0.0000
INSIDER	-1.520655	6.875113	-0.221183	0.8250
INSTITUTIONAL	1.377133	4.758419	0.289410	0.7723
TAX_SHIELD	67.68849	349.4598	0.193695	0.8465

R-squared	0.082702	Mean dependent var	19.21170
Adjusted R-squared	0.072943	S.D. dependent var	2221.357
S.E. of regression	2138.806	Akaike info criterion	18.18564
Sum squared resid	3.44E+09	Schwarz criterion	18.24045
Log likelihood	-6910.636	Hannan-Quinn criter.	18.20675
F-statistic	8.474870	Durbin-Watson stat	2.938989
Prob(F-statistic)	0.000000		

Model 4 (All)

Dependent Variable: D(CHANGE_IN_DEBT)
Method: Panel Least Squares
Date: 05/21/18 Time: 19:36
Sample (adjusted): 2010 2017
Periods included: 8
Cross-sections included: 104
Total panel (unbalanced) observations: 761

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-331.5200	344.0905	-0.963468	0.3356
D(TANGIBILITY)	3324.577	3035.541	1.095217	0.2738
D(MTB)	-33.12015	11.91910	-2.778745	0.0056
D(LN_NS_)	815.7040	304.2099	2.681386	0.0075
D(PROFITABILITY)	0.412010	6.367970	0.064700	0.9484
D(DEF)	0.106579	0.013831	7.705607	0.0000
INSIDER	-0.939911	7.204767	-0.130457	0.8962
INSTITUTIONAL	1.084527	4.973414	0.218065	0.8274
D(TAX_SHIELD)	1961.079	545.8240	3.592879	0.0003
CONSUMER_GOODS	688.5184	351.0376	1.961381	0.0502
CONSUMER_SERVICES	337.2290	354.4266	0.951478	0.3417
HEALTH_CARE	150.1560	354.3179	0.423789	0.6718
INDUSTRIALS	227.3411	311.5557	0.729697	0.4658
OIL___GAS	159.8406	829.7543	0.192636	0.8473
TECHNOLOGY	199.1385	378.2351	0.526494	0.5987

R-squared	0.104153	Mean dependent var	19.21170
Adjusted R-squared	0.087341	S.D. dependent var	2221.357
S.E. of regression	2122.133	Akaike info criterion	18.17775
Sum squared resid	3.36E+09	Schwarz criterion	18.26910
Log likelihood	-6901.632	Hannan-Quinn criter.	18.21292
F-statistic	6.195102	Durbin-Watson stat	2.934730
Prob(F-statistic)	0.000000		

Breusch-Pagan/Cook-Weisberg test for heteroskedasticity
Variables: fitted values of D (CHANGE IN DEBT)
Ho: Constant variance/Homoscedasticity
Chi2(1) = 0.90
Prob>chi2 = 0.3430

Large Firm

Dependent Variable: D(CHANGE_IN_DEBT)
Method: Panel Least Squares
Date: 05/21/18 Time: 20:34
Sample: 2009 2017 IF LN_NS >@MEDIAN(LN_NS_,"@all")
Periods included: 8
Cross-sections included: 63
Total panel (unbalanced) observations: 396

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-6.964176	484.6322	-0.014370	0.9885
D(TANGIBILITY)	9083.417	5681.238	1.598845	0.1107
D(MTB)	-32.62742	17.21839	-1.894917	0.0588
D(LN_NS_)	2129.291	950.8370	2.239385	0.0257
D(PROFITABILITY)	1165.042	4454.513	0.261542	0.7938
D(DEF)	0.112631	0.018668	6.033484	0.0000
INSIDER	-5.012869	12.78751	-0.392013	0.6953
INSTITUTIONAL	1.608576	9.444024	0.170327	0.8648
D(TAX_SHIELD)	10190.00	1959.741	5.199666	0.0000

R-squared	0.167630	Mean dependent var	25.83838
Adjusted R-squared	0.150424	S.D. dependent var	3075.552
S.E. of regression	2834.812	Akaike info criterion	18.75980
Sum squared resid	3.11E+09	Schwarz criterion	18.85029
Log likelihood	-3705.441	Hannan-Quinn criter.	18.79565
F-statistic	9.742196	Durbin-Watson stat	2.875863
Prob(F-statistic)	0.000000		

Large Firms

Dependent Variable: D(CHANGE_IN_DEBT)
Method: Panel Least Squares
Date: 05/21/18 Time: 20:07
Sample: 2009 2017 IF LN_NS >@MEDIAN(LN_NS_,"@all")
Periods included: 8
Cross-sections included: 63
Total panel (unbalanced) observations: 396

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-230.4162	584.7254	-0.394059	0.6938
D(TANGIBILITY)	9305.300	5728.166	1.624482	0.1051
D(MTB)	-35.18715	17.41654	-2.020330	0.0440
D(LN_NS_)	2205.242	977.4372	2.256147	0.0246
D(PROFITABILITY)	1071.010	4460.238	0.240124	0.8104
D(DEF)	0.114023	0.018690	6.100607	0.0000
INSIDER	-2.722703	13.67213	-0.199143	0.8423
INSTITUTIONAL	-2.548485	11.18710	-0.227806	0.8199
D(TAX_SHIELD)	10680.17	2026.663	5.269828	0.0000
CONSUMER_GOODS	966.4871	548.2171	1.762964	0.0787
CONSUMER_SERVICES	510.0649	584.1230	0.873215	0.3831
HEALTH_CARE	623.9132	717.1674	0.869969	0.3849
INDUSTRIALS	279.3081	491.0761	0.568768	0.5698
OIL___GAS	-1215.609	1416.928	-0.857919	0.3915
TECHNOLOGY	-242.5070	2907.754	-0.083400	0.9336

R-squared	0.180104	Mean dependent var	25.83838
Adjusted R-squared	0.149976	S.D. dependent var	3075.552
S.E. of regression	2835.558	Akaike info criterion	18.77501
Sum squared resid	3.06E+09	Schwarz criterion	18.92582
Log likelihood	-3702.452	Hannan-Quinn criter.	18.83475
F-statistic	5.978061	Durbin-Watson stat	2.902421
Prob(F-statistic)	0.000000		

Small Firms

Dependent Variable: D(CHANGE_IN_DEBT)
Method: Panel Least Squares
Date: 05/21/18 Time: 20:36
Sample: 2009 2017 IF LN_NS <@MEDIAN(LN_NS_,"@all")
Periods included: 8
Cross-sections included: 60
Total panel (unbalanced) observations: 365

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-32.72561	32.18797	-1.016703	0.3100
D(TANGIBILITY)	306.8051	410.2592	0.747832	0.4551
D(MTB)	-0.836012	3.046844	-0.274386	0.7839
D(LN_NS_)	117.4693	32.38023	3.627808	0.0003
D(PROFITABILITY)	0.648161	0.568749	1.139626	0.2552
D(DEF)	-0.030061	0.031017	-0.969185	0.3331
INSIDER	-0.296808	0.920399	-0.322477	0.7473
INSTITUTIONAL	0.695086	0.579759	1.198923	0.2314
D(TAX_SHIELD)	196.3735	53.53605	3.668060	0.0003

R-squared	0.075240	Mean dependent var	12.02219
Adjusted R-squared	0.054459	S.D. dependent var	194.8178
S.E. of regression	189.4387	Akaike info criterion	13.35036
Sum squared resid	12775783	Schwarz criterion	13.44652
Log likelihood	-2427.440	Hannan-Quinn criter.	13.38857
F-statistic	3.620600	Durbin-Watson stat	2.770140
Prob(F-statistic)	0.000459		

Small Firms

Dependent Variable: D(CHANGE_IN_DEBT)
Method: Panel Least Squares
Date: 05/21/18 Time: 20:10
Sample: 2009 2017 IF LN_NS <@MEDIAN(LN_NS_,"@all")
Periods included: 8
Cross-sections included: 60
Total panel (unbalanced) observations: 365

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-63.35803	69.53848	-0.911122	0.3629
D(TANGIBILITY)	282.8506	415.9589	0.679997	0.4970
D(MTB)	-0.593954	3.080207	-0.192829	0.8472
D(LN_NS_)	124.3088	32.91312	3.776877	0.0002
D(PROFITABILITY)	0.660198	0.570944	1.156328	0.2483
D(DEF)	-0.028311	0.031218	-0.906901	0.3651
INSIDER	-0.358066	0.972800	-0.368077	0.7130
INSTITUTIONAL	0.747001	0.591214	1.263504	0.2072
D(TAX_SHIELD)	205.3785	54.22340	3.787637	0.0002
CONSUMER_GOODS	67.26184	71.30347	0.943318	0.3462
CONSUMER_SERVICES	46.69868	67.41475	0.692707	0.4890
HEALTH_CARE	12.25786	66.15034	0.185303	0.8531
INDUSTRIALS	29.36768	64.33513	0.456480	0.6483
OIL___GAS	129.7082	130.2051	0.996184	0.3198
TECHNOLOGY	16.21526	65.54274	0.247400	0.8047

R-squared	0.084304	Mean dependent var	12.02219
Adjusted R-squared	0.047676	S.D. dependent var	194.8178
S.E. of regression	190.1170	Akaike info criterion	13.37338
Sum squared resid	12650569	Schwarz criterion	13.53365
Log likelihood	-2425.643	Hannan-Quinn criter.	13.43708
F-statistic	2.301624	Durbin-Watson stat	2.794341
Prob(F-statistic)	0.004955		

Appendix 2

Correlation Coefficients (ALL)

Covariance Analysis: Ordinary
Date: 05/22/18 Time: 09:07
Sample: 2010 2017
Included observations: 784
Balanced sample (listwise missing value deletion)

Covariance Correlation	D(TANGIBIL...	D(MTB)	D(LN NS)	D(PROFIT...	D(DEF)	INSIDER	INSTITUTI...	D(TAX SHI...	CONSUM...	CONSUM...	HEALTH C...	INDUSTRIA...	OIL GAS	TECHNOL...
D(TANGIBILITY)	0.000674													
	1.000000													
D(MTB)	0.007360	49.93072												
	0.040114	1.000000												
D(LN NS)	-0.001402	-0.114226	0.074122											
	-0.198330	-0.059376	1.000000											
D(PROFITABILITY)	0.003176	-0.733628	0.025259	141.7733										
	0.010272	-0.008720	0.007792	1.000000										
D(DEF)	-18.49868	1144.159	-29.59569	68.46340	30740330									
	-0.128501	0.029204	-0.019607	0.001037	1.000000									
INSIDER	-0.024429	-5.663360	0.326129	0.597751	-153.1800	139.8345								
	-0.079566	-0.067777	0.101300	0.004245	-0.002336	1.000000								
INSTITUTIONAL	0.023110	-5.255210	-0.460134	0.635471	-2025.202	-49.25941	291.4989							
	0.052131	-0.043560	-0.098990	0.003126	-0.021394	-0.243985	1.000000							
D(TAX SHIELD)	0.000161	-0.047991	-0.003846	-0.008278	-10.10639	0.030126	-0.086426	0.019831						
	0.043915	-0.048228	-0.100303	-0.004937	-0.012944	0.018091	-0.035946	1.000000						
CONSUMER G...	0.000357	0.177729	-0.009449	-0.014521	-24.12049	-0.727720	0.776311	-0.001493	0.115056					
	0.040529	0.074151	-0.102321	-0.003595	-0.012826	-0.181427	0.134049	-0.031252	1.000000					
CONSUMER SE...	0.000118	-0.085111	-0.001141	-0.015569	-25.19729	0.408437	-1.041678	-0.001188	-0.017935	0.116924				
	0.013260	-0.035225	-0.012256	-0.003824	-0.013291	0.101010	-0.178428	-0.024669	-0.154632	1.000000				
HEALTH CARE	1.18E-05	-0.115430	0.011333	0.092676	2.108024	0.663144	-0.562103	0.002963	-0.019289	-0.019660	0.124265			
	0.001293	-0.046340	0.118084	0.022080	0.001079	0.159084	-0.093395	0.059690	-0.161316	-0.163100	1.000000			
INDUSTRIALS	-0.000402	-0.014913	-0.001166	-0.042005	-10.36362	0.267004	1.656489	-0.000247	-0.052283	-0.053288	-0.057310	0.238792		
	-0.031670	-0.004319	-0.008765	-0.007219	-0.003825	0.046206	0.198546	-0.003592	-0.315424	-0.318912	-0.332696	1.000000		
OIL GAS	5.43E-05	0.000538	-0.000266	-0.000785	-0.370326	0.218609	-0.289813	0.000686	-0.001354	-0.001380	-0.001484	-0.004022	0.010100	
	0.020812	0.000758	-0.009713	-0.000656	-0.000665	0.183951	-0.168904	0.048438	-0.039708	-0.040147	-0.041882	-0.081893	1.000000	
TECHNOLOGY	0.000144	0.117589	0.005369	-0.011325	0.431032	-0.246213	-0.226961	0.000360	-0.014044	-0.014314	-0.015394	-0.041726	-0.001080	0.094659
	0.018056	0.054088	0.064096	-0.003091	0.000253	-0.067674	-0.043207	0.008307	-0.134568	-0.136056	-0.141937	-0.277532	-0.034938	1.000000

Large Firms

Covariance Analysis: Ordinary
Date: 05/22/18 Time: 09:12
Sample: 2015 2017
Included observations: 401
Balanced sample (listwise missing value deletion)

Covariance Correlation	D(TANGIBIL...	D(MTB)	D(LN NS)	D(PROFIT...	D(DEF)	INSIDER	INSTITUTI...	D(TAX SHI...	CONSUM...	CONSUM...	HEALTH C...	INDUSTRIA...	OIL GAS	TECHNOL...
D(TANGIBILITY)	0.000748													
	1.000000													
D(MTB)	0.005457	71.26468												
	0.023636	1.000000												
D(LN NS)	-0.001370	0.075216	0.029150											
	-0.293361	0.052186	1.000000											
D(PROFITABILITY)	-0.000261	0.005103	0.001686	0.001217										
	-0.273584	0.017324	0.283049	1.000000										
D(DEF)	-35.18276	2323.547	-49.53131	-1.989253	60001973									
	-0.166075	0.035533	-0.037452	-0.007360	1.000000									
INSIDER	-0.040074	-5.563128	0.374449	-0.004079	-356.2051	140.7207								
	-0.123521	-0.055552	0.184882	-0.009855	-0.003876	1.000000								
INSTITUTIONAL	0.020726	0.573551	0.080856	0.025858	-3909.771	-50.02171	257.3996							
	0.047235	0.004235	0.029518	0.046191	-0.031460	-0.262830	1.000000							
D(TAX SHIELD)	-7.09E-05	-0.078215	0.002701	-0.000375	-17.58839	0.025121	-0.064803	0.005865						
	-0.033865	-0.120978	0.206575	-0.140318	-0.029648	0.027651	-0.052740	1.000000						
CONSUMER G...	0.000676	0.334146	-0.007040	4.26E-05	-48.54184	-0.855032	1.297820	-0.000612	0.155148					
	0.062710	0.100491	-0.104683	0.003101	-0.015910	-0.182991	0.205370	-0.020290	1.000000					
CONSUMER SE...	8.12E-05	-0.091499	-0.003541	-0.000665	-48.20121	0.974032	-2.152503	-0.000356	-0.026816	0.120149				
	0.008564	-0.031269	-0.059835	-0.054975	-0.017952	0.236884	-0.387062	-0.013394	-0.196407	1.000000				
HEALTH CARE	-0.000455	-0.080861	0.007023	0.000646	-0.901300	0.076633	-0.126316	-0.002391	-0.011971	-0.008706	0.058457			
	-0.068832	-0.039617	0.170124	0.076545	-0.000481	0.026719	-0.032564	-0.129135	-0.125704	-0.103887	1.000000			
INDUSTRIALS	-0.000428	0.024236	0.004787	2.66E-05	-12.99869	0.188635	2.592999	0.002021	-0.089067	-0.064776	-0.028918	0.248692		
	-0.031413	0.005757	0.056224	0.001530	-0.003365	0.031887	0.324091	0.052910	-0.453430	-0.374733	-0.239835	1.000000		
OIL GAS	5.44E-05	-0.018820	0.000474	-0.000234	0.711760	0.297022	-0.369802	0.001565	-0.002394	-0.001741	-0.000777	-0.005784	0.012313	
	0.017932	-0.020091	0.025002	-0.060383	0.000828	0.225643	-0.207719	0.184197	-0.054779	-0.045271	-0.028974	-0.104514	1.000000	
TECHNOLOGY	0.000167	0.015230	0.000921	-4.05E-05	-3.021231	-0.028822	-0.185327	4.35E-05	-0.000958	-0.000697	-0.000311	-0.002313	-6.22E-05	0.004963
	0.086934	0.025609	0.076577	-0.016477	-0.005537	-0.034490	-0.163975	0.008067	-0.034514	-0.028524	-0.018256	-0.065852	-0.007955	1.000000

Small Firms

Covariance Analysis: Ordinary
Date: 05/22/18 Time: 09:16
Sample: 2010 2015
Included observations: 383
Balanced sample (listwise missing value deletion)

Covariance Correlation	D(TANGIBIL...	D(MTB)	D(LN_NS_)	D(PROFIT...	D(DEF)	INSIDER	INSTITUTI...	D(TAX_SHI...	CONSUM...	CONSUM...	HEALTH_C...	INDUSTRIA...	OIL_GAS	TECHNOL...
D(TANGIBILITY)	0.000596													
	1.000000													
D(MTB)	0.009802	27.25765												
	0.076885	1.000000												
D(LN_NS_)	-0.001480	-0.279509	0.117958											
	-0.176455	-0.155879	1.000000											
D(PROFITABILITY)	0.006648	-1.412867	0.040683	290.1820										
	0.015982	-0.015886	0.006954	1.000000										
D(DEF)	-1.043486	-80.93679	-9.678359	139.5052	103185.0									
	-0.133034	-0.048261	-0.087726	0.025495	1.000000									
INSIDER	-0.010771	-3.732411	0.075489	0.657809	0.565897	126.5878								
	-0.039206	-0.063540	0.019536	0.003432	0.000157	1.000000								
INSTITUTIONAL	0.027032	-12.42486	-0.921708	1.572484	-21.23669	-42.00533	323.8174							
	0.061520	-0.132250	-0.149135	0.005130	-0.003674	-0.207471	1.000000							
D(TAX_SHIELD)	0.000398	-0.012835	-0.011045	-0.017536	-2.374178	0.014122	-0.097933	0.034417						
	0.087915	-0.013252	-0.173346	-0.005549	-0.039840	0.006766	-0.029335	1.000000						
CONSUMER_G...	9.08E-05	-0.036453	-0.007018	-0.015653	2.905138	-0.289382	0.070427	-0.001889	0.065526					
	0.014522	-0.027276	-0.079823	-0.003590	0.035331	-0.100477	0.015289	-0.039776	1.000000					
CONSUMER_SE...	0.000161	-0.082199	0.001743	-0.030117	-1.003143	-0.160891	0.109378	-0.002020	-0.009203	0.113505				
	0.019576	-0.046732	0.015063	-0.005248	-0.009269	-0.042445	0.018042	-0.032318	-0.106714	1.000000				
HEALTH_CARE	0.000406	-0.081086	0.008914	0.169280	3.220843	0.850413	-0.794696	0.007833	-0.016382	-0.030336	0.178377			
	0.039412	-0.036773	0.061455	0.023529	0.023741	0.178963	-0.104564	0.099972	-0.151523	-0.213199	1.000000			
INDUSTRIALS	-0.000295	-0.115097	-0.001582	-0.069437	-5.894464	0.707232	0.488256	-0.002004	-0.022640	-0.041925	-0.074627	0.218012		
	-0.025859	-0.047215	-0.009868	-0.008730	-0.039300	0.134625	0.058111	-0.023136	-0.189419	-0.266519	-0.378431	1.000000		
OIL_GAS	5.68E-05	0.018884	-0.000851	-0.000824	-1.447703	0.148148	-0.212163	-0.000216	-0.000552	-0.001023	-0.001820	-0.002516	0.007772	
	0.026366	0.041029	-0.028106	-0.000549	-0.051123	0.149364	-0.133741	-0.013183	-0.024470	-0.034430	-0.048887	-0.061113	1.000000	
TECHNOLOGY	5.36E-06	0.310425	0.001608	-0.047127	1.570506	-0.992168	0.001099	-0.000203	-0.014909	-0.027609	-0.049145	-0.067919	-0.001657	0.166761
	0.000537	0.145602	0.011466	-0.006775	0.011972	-0.215944	0.000150	-0.002675	-0.142625	-0.200679	-0.284945	-0.356209	-0.046016	1.000000

Appendix 3

Distribution of Firms listed on the Nasdaq Stockholm Stock Exchange		
Industry Classification	**Number of Firms**	
Basic Material	15	
Consumer Goods	26	
Consumer Services	27	
Financials (Financial Institutions)	52	
Industrials	53	
Health Care	28	
Oil & Gas	4	
Technology	14	
Telecommunication	6	
Total Sampled Firms	225	225
Exclusions:		
Financials (Financial Institutions)	53	
Firms with Insufficient Data	47	
Firms Domicile Outside Sweden	18	
Total Firms Excluded	118	117
Actual Sampled Firms for Study		**107**

Appendix 4

Previous studies on Perking order theory, Financing decisions and Ownership structure.

STUDY	DATA	METHOD/APPROACH	RESULTS
Pecking order theory			
Bhama et, al. 2016	Bombay Stock Exchange (BSE) 500 index, Indian firms: 2003 -2012	Ordinary least square regressions	Pecking order theory is an excellent descriptor for deficit firms, but a poor one for surplus firms.
Burgstaller & Wagner 2015	A sample of 470 SMEs from a bank-based Economies 2005 - 2010	Panel data model	Firms with a founder-chief executive officer (CEO) adjust faster to deviations from a target debt ratio.
Yazdanfar & Öhman 2014	A cross-sectoral sample of 15,897 of Swedish SMEs five industry sectors during the 2009-2012	Three-stage least squares (3SLS) and fixed-effects models	SME owners and managers tend to finance businesses with equity capital to a higher extent
Leary & Roberts 2010	Compustat data base for financial firms: 1980–2005	a novel empirical model and testing strategy compared to Shyam-Sunder and Myers's (1999)	Perking Order is explaned by incentive conflicts rather than information assymetry
Sjögren and Zackrisson 2005	High technology small firms (HTSFs) in Sweden and USA		Pecking order is different for HTSFs than for larger firms, that HTSFs prefer equity financing.
Sanchez-Vidal and Martin-Ugedo 2005	A sample of 1,566 Spanish firms 1994–2000.	Panel data analysis	SMEs as well as high growth leveraged firms adheres to pecking order theory and highly leveraged companies.
Murray and Goyal 2003	American firms 1991 - 1998	Shyam-Sunder and Myers (1999)	Evidence of relationship between large firms and Perking Order, and financing deficit is less explain net debt issues over time for firms of all sizes
Bontempi M .E 2000	A sample of 52000 Italian firms from Company Accounts Data Service (CADS): 1982	Auerbach, 1985 and Shyam-Sunder and Myers. 1999 models; Error-Correction Mechanism (ECM) model	Trade off-type firms encourage long-term optimal debt ratio while Perking order-type firms with available short-term internal funds for investment may use leverage.
Ownership identity			
Wang & Sheiler 2018	36 countries classified as emerging stock markets in the S&P Emerging Market Database (EMDB)	Meta-Data Analysis models	Dynamisim in nature of ownership performance relations in emerging markets.
Boubaker Derouiche & Nguyen 2015	A sample of 6797 French listed firms from 2000 to 2013	based on the investment model developed by Fazzari et al. (1988)	Considerable internal funds for investments when there is severe agency problems, driven by excess control rights of the controlling shareholders.
Kang and Kim 2015	all firms in East Asia from 1991–1996 appearing on the Worldscope tape	same basic approach as Fazzari et al. (1988), La Porta et al. (1999) and others	negative association between the ownership discrepancy and the level of investments
Grinstein and Michaely (2005	US Public Firms from 1980-1996	Panel Data analysis	No correlation between Institutioanal ownership and payouts. But higher monitoring compared to individual owners.
Ozakar & Ozarkar 2004	UK firms s from 1984to 1999	Panel Data Analysis	Ownership structure of firms, positively and significantly related to cash holdings