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DETERMINANTS OF CAPITAL STRUCTURE CHOICES OF SWEDISH FIRMS IN THE FOREST AND FOREST PRODUCTS INDUSTRY

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I hereby declare that I have compiled the thesis independently and all works, important standpoints and data by other authors have been properly referenced and the same paper has not been previously presented for grading.
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ABSTRACT

The aim of this paper is to study the financing choices made by Swedish firms in the forest and forest products industry, and to test the applicability of the fundamental theories of capital structure. The research problem is understanding the choices firms make regarding their capital structures.

The study consists of 54 Swedish firms operating in this industry. The variables observed in this paper are the following. For leverage, short-term and long-term debt ratios are taken. The expected determinants are size, liquidity, asset structure, growth, profitability, and non-debt tax shield. Data used is from the Orbis database, for the period of 2011-2019.

The paper gives an overview of the fundamental theories of capital structure, namely the Modigliani and Miller's irrelevance of capital structure theory, the trade-off theory, the pecking order theory, and the agency costs theory. From these, the hypotheses are drawn and later tested using panel regression models, estimated following the fixed effects and random effects estimation techniques.

The main findings are that the propositions of the fundamental theories are generally applicable to the financing choices of Swedish firms in the chosen industry, particularly the pecking order theory. Moreover, significant variables for short-term debt were found to be growth, liquidity, asset structure and non-debt tax shields. For long-term debt, significant variables were all the independent variables chosen besides liquidity. The results point to a potential tendency to keep debt levels moderate or low, and preference for equity financing or internal financing.

Keywords: leverage, capital structure, panel data, regression.

INTRODUCTION

The topic of this paper lies within the scope of the financing decision that firms need to make, which includes choosing the right mix of financing sources; debt and equity, one that will enable the firm to maximize its value. This mix is referred to as Capital Structure. It has been the object of extensive research over the years, which reflects its importance in the financial field. This, along with a personal interest in the matter, has been the first motivator for choosing this topic.

The research problem of this paper is understanding the pattern of choices that firms make in regard to their capital structures. The pioneering idea in this field is that the choice of capital structure is irrelevant to a firm's value, and that whether a firm chooses to finance its activities through equity or debt is essentially no different (Modigliani, Miller 1958). Studies which have followed are built on different underlying assumptions and have different focus points. They aimed to explore companies' financing choices and preferences and sought to prove the existence of an optimal leverage level or the lack thereof. As stated by Harris, Raviv (1991), empirical studies done later to test the applicability of these theories, in various settings of industry and company-specific factors, have been, more often than not, consistent with the theory.

The sample studied is that of Swedish firms operating in the forestry and forest-based products industry, which includes activities like wood harvesting, production of paper, pulp, etc. This industry was selected out of personal interest and because of its uniqueness and specificities such as its cyclicality and for example, harvesting companies' sensitivity to economic conditions (Penttinen *et al.* 2010). These industry traits make the choice of capital structure all the more critical. Additionally, the Swedish forestry industry is a major player in the country's economy. For instance, the Swedish Forest Industries Federation estimates that this industry is behind 9% to 12% of employment in the country, and that Sweden holds the world's third position in exports of some forest-based products like pulp.

Moreover, there seems to be few studies on capital structure of Nordic countries, of which Sweden, as compared to others like the United States for example which is noticeably dominant in the

literature. Also, as noted by Hetemäki, Hurmekoski (2016), though in a different research context, there is a small number of studies on the industry of forest-based products in general. These two factors were additional motivators for this paper.

The aim of this paper is to study the financing choices made by Swedish firms in the forest and forest products industry, and to test the applicability of the fundamental theories of capital structure. The paper attempts to assess if and how a set of chosen factors, common in previous literature, determine the choices that the selected firms make regarding their leverage levels. The financing choices of the sample, found through this study, will then be compared to what would be expected, following the reasoning of the fundamental theories on the topic. The findings of this paper will also be compared to those of similar previous empirical studies to see what points of compatibility or disagreement there are.

This thesis will attempt to answer the following research questions:

- Are capital structure choices of Swedish firms in the forest and forest-based products industry determined by chosen factors from the academic literature on the topic?
- Are the capital structure choices of the chosen firms aligned with fundamental theories?

To achieve this, a regression analysis will be performed on financial data of 54 firms. The data used for this paper is secondary, consisting of financial figures selected and calculated from the selected firms' balance sheets and income statements for the years 2011-2019, retrieved from the Orbis database.

The structure of this thesis is split into three main sections. In the first, a review of previous literature, consisting of most relevant theoretical studies and empirical studies done on the topic will be given. The fundamental theories that are covered are Modigliani and Miller's theorem, the trade-off theory, the agency costs theory, and the pecking order theory. The second part of the thesis will be dedicated to the methodology and data. In this section, the variables used will be defined, and the method used in conducting this study will be discussed. This part will also include descriptive statistics of the sample data. Lastly, the third section will consist of the results of the regression model, as well as a discussion of the findings, before concluding to complete the answer to the research questions.

1. CAPITAL STRUCTURE LITERATURE

This section provides a review of relevant existing literature, theoretical and empirical, on capital structure determinants, out of which hypotheses for this paper are drawn. This literature review focuses mainly on the variables selected for this paper, which are size, asset structure, profitability, growth, liquidity, and non-debt tax shields. As for leverage, since literature has shown the importance of distinguishing between long-term debt and short-term debt, both will be studied.

1.1. Fundamental theories of capital structure

Generally speaking, a firm has two types of financing sources: internal and external. Internal sources are earnings derived from firms' assets. External sources include external debt from banks or other institutions, corporate bonds, etc. and external equity investment. The mix between these two sources of financing is what constitutes the capital structure. Capital structure is crucial because it is, through the cost of capital, related to the company's value whose maximization is the main goal of corporate finance. A firm's value is maximized when its cost of capital is minimized.

1.1.1. Modigliani and Miller's propositions

Modigliani and Miller (1958) has been the first building block of capital structure theory and this theory (MM) has been the starting point of all subsequent literature. It is based on the assumption of a perfect efficient market. In this setting, there is a stable market, no information asymmetry, no agency costs, no bankruptcy risks, and no financial distress costs. The MM theory argues that the capital structure a firm chooses has no effect on its value, hence why it is known as the irrelevance of capital structure theory. Finding the optimal capital structure is no longer an issue, as from this perspective, there is none (Modigliani, Miller 1958). A firm's value is essentially determined by its cashflows and assets, making two firms with comparable assets and cashflows equal in the eyes of investors, and weights given to each financing source in a firm's structure of capital unimportant (Modigliani, Miller 1958).

The MM theory has paved the way for ensuing studies by determining the conditions under which capital structure is insignificant (Harris, Raviv 1991). However, it has been criticized for the simplicity of its underlying assumptions which, in most researchers' opinions, make it unviable in real market conditions. A few years after the first 1958 study, the MM theory was amended to incorporate taxes. With taxes taken into consideration, firms, by taking on debt, now have the possibility to benefit from a tax shield stemming from the deductibility of interest payments. According to this new proposition, this would reduce the firm's cost of capital as more debt is used, which would incur an increase in firm value. The theory states that, to exploit this tax benefit, firms are better off with increasing levels of leverage (Modigliani, Miller 1963).

The study DeAngelo and Masulis (1980) argues that the presence of non-debt tax shields, of which depreciation tax shields and investment tax shields, can lower the debt-related tax benefits. Higher non-debt tax shields are found to be linked to lower leverage (Titman, Wessels 1988).
From here, the first hypothesis is formulated as follows:
H1: Depreciation non-debt tax shield is negatively associated with leverage.

Interestingly, Miller (1977), a further study, argued that even with corporate taxes and deductibility of interest payments in the picture, there is no optimal leverage level, and two firms on opposite side of the leverage level spectrum are still potentially valued the same (Miller 1977).

The propositions of Modigliani and Miller, however, fail to explain the increasing debt conservatism that is seen in firms which choose to have zero-debt, foregoing the potential increase in value they could gain by taking on some leverage (Byoun, Xu 2013). While being heavily leveraged would provide attractive tax gains, there is a point at which costs of debt outweigh its gains, putting firms in situations of high default, bankruptcy, and distress risks. This brings us to the next theory.

1.1.2. The static trade-off theory (TOT)

One of the most criticized aspects of the above MM theory is its negligence of negative aspects of debt financing, such as the risk of bankruptcy (Stiglitz 1969). Heavy borrowing could be accompanied by increased distress costs and risk of bankruptcy and default. The presence of financial distress hinders the firm's performance and weakens its ability to negotiate favourable terms with creditors or other parties of its supply chain, as it is seen as less reliable.

The trade-off theory stipulates that an optimal level of debt exists at the point of balance between tax benefits and distress costs (Myers 1984). Therefore, debt should be taken carefully only up until the point where the costs are at least balanced by the benefits in tax savings. The theory then supports moderate debt levels (Myers 2001). According to this approach, profitable firms are expected to have higher leverage levels, as they would have a larger taxable income and could exploit the interest tax shield (Myers 2001). Other results of this reasoning are that firms with more intangible assets are expected to refrain from too much borrowing, and vice versa (Titman, Wessels 1988). Intangible assets are not easily valued in monetary terms and cannot usually serve as collateral for debt.

While the view on firm size factor is ambiguous in literature, one idea is that because larger firms tend to be more diversified (Titman, Wessels 1988), and are less likely to fail, they usually have lower bankruptcy risk and so, are expected to have higher leverage (Rajan, Zingales 1995).

From this perspective, we formulate the following hypotheses:
H2: Tangibility of assets (asset structure) is positively associated with use of debt.
H3: Size is positively associated with leverage.

The TOT theory is criticized for having a restrictive view of the costs of debt. Additionally, the fact that debt had been used even in absence of tax-related debt advantages, as opposed to equity means that there is more to be explored when it comes to the determinants of capital structure (Jensen, Meckling 1976). The static trade off theory has been supplemented with the element of agency costs as a part of negative aspects of debt, resulting in the next theory.

1.1.3. Agency cost theory

Agency costs are those resulting from the conflicts of interests between managers, owners, and creditors, as they each seek to maximize their individual utility. Agency problems between owners and managers arise from the latter having full control of the firm's funds and how they are used. This may not always be in alignment with the owners' views of what constitutes a good investment and use of the money. Owners may try to alleviate this problem through monitoring the managers, but this is costly and difficult to do (Myers 2001). Agency costs are summarized as the total of monitoring expenditures, bonding expenditures, and residual loss (Jensen, Meckling 1976).

The main idea of the agency theory is that when equity is more costly and gains from the investment of borrowed capital can balance out agency costs related to debt, it is a good financing decision to use debt. This is valid even in absence of tax shield benefits (Jensen, Meckling 1976). According to Myers (2001), growing firms face higher agency costs, and therefore tend to use equity for financing. This leads to the following hypothesis:
H4: Growth is negatively associated with use of debt.

Another aspect to this is provided by the free cash flow theory. According to this theory, issuing debt helps firms lessen the burden of the inevitable agency costs though reducing free cash flow in the hands of managers. This acts as an incentive for managers to be more efficient as they are bound to make debt payments (Jensen 1986). Also, creditors would have a claim on the firm's cash flows, thereby reducing the amount of cash left at the managers' disposition, and this reduces the risk of overinvesting in potentially bad investments in the eyes of the owners (Jensen 1986).

In general, the agency cost theory suggests that there exists an optimal debt level which maximizes firm value, which is a result of the trade-off between the benefits and costs of debt (Stulz 1990). In his paper, Jensen also states that the firm's size, growth, profitability, and cash flow availability could alter this result (Jensen 1986).

1.1.4. Pecking order theory (POT)

The pecking order theory focuses on the issue of information asymmetry and resulting costs, which impact the firm value directly (Myers, Majluf 1984). Information asymmetry is a form of market inefficiency and is present because, for example, managers tend to have more knowledge on the state of the firm's financial wellbeing than external parties. In this regard, capital structure is decided with the aim of alleviating information asymmetry related inefficiencies (Harris, Raviv 1991).

POT argues that there is a hierarchy of financing sources, where risks and costs increase moving from one level to the next and the firm's preference declines. According to this theory, firms prefer to finance their activities using their retained earnings first. Once those are exhausted, their second choice would then be debt financing, which is more expensive than the latter due to the regular interest payments and risks explained before. As a final resort, firms choose equity financing, which is typically more expensive and is also riskier than the previous two, due to increased information asymmetry. Therefore, there is no optimal leverage level target, but a gradual shift

from one source to another as needs require. (Myers, Majluf 1984) While in the trade off theory, debt is issued until the target level is achieved, in the POT, debt is issued until debt capacity is exhausted (De Jong *et al.* 2011). According to this, between two firms with the same investment needs, the most profitable would have lower leverage, as it has more internal funds available and using those is preferred. Additionally, if profitability is similar, leverage would be higher for the firm whose investment is higher than its retained earnings can cover (Fama, French 2002).
This leads to the following hypotheses:
H5: Profitability is negatively associated with leverage use.
H6: Liquidity is negatively associated with use of debt.

Since each of these theories is based on specific assumptions and conditions, their findings on firms' capital structures may not be valid for every given situation. The capital structure decision depends on many other factors related to industry and firm specificities and is driven by many motives and constraints. Further studies have also found that country-specific factors can also play an important role, and there is still much room for new explanatory variables to be tested.

The following section introduces findings of selected empirical studies which have tested the validity of the previous theories in different environments. This will provide a basis for the model used later on and for comparison with later findings of this paper as well.

1.2. Empirical studies

There are many studies which test the previously mentioned theories, using data from different countries, at varying development stages, operating in different industries etc. This section will cite a number of these, starting from most known ones and ending with studies which are closer to the chosen country and industry of this paper.

Rajan and Zingales (1995), have conducted a study to analyse financing decisions of firms from the G7 countries. They have focused on the following variables: tangibility, profitability, firm size, and market-to-book ratio. This study has found that leverage level between firms of these countries is less different than expected overall, but some variations still exist. Through this study, the authors have not found great support for the theorized roles of the above variables. For example, according to the paper, the belief that the burden of financial distress is higher on smaller firms,

leading to them to pursue lower leverage has not held for German firms studied as they have significantly higher debt than larger firms (Rajan, Zingales 1995). Generally, this study finds that profitability is negatively correlated with leverage, and that tangibility and size are positively correlated with leverage (Rajan, Zingales 1995). This study highlights the need for better understanding of determinants of capital structure and enhancement of empirical models' testing capacities (Rajan, Zingales 1995).

Titman and Wessels (1988) studied the effects of variables such as growth, size, uniqueness, liquidity of assets on capital structure choices of 469 firms. Due to data availability limitations, book values of short and long-term debt are used. This study has found that smaller firms tend to issue more short-term debt than larger firms, which highlights the importance of the high transaction costs they face as a constraining factor to their choices (Titman, Wessels 1988). This paper did not find support for the importance of volatility, non-debt tax shields and tangibility in determining firms' financing decisions (Titman, Wessels 1988).
Following these results and as this thesis also considers both long- and short-term debt, H3 is specified further:
H3.a: Size is positively associated with the use of long-term debt.
H3.b: Size is negatively associated with the use of short-term debt.

Marsh (1982), tests how selected companies in the United Kingdom choose to finance their activities, between debt and equity issuing. The study finds that firms operate with a target leverage level in mind, disproving the pecking order theory's idea, and that these targets are a function of variables such as firm size, bankruptcy risk and asset structure (Marsh 1982). Firms which are small, have a mostly intangible asset structure, and those with high bankruptcy risk seem to prefer equity financing, which is aligned with the trade-off theory reasoning (Marsh 1982). The study finds that firms tend to issue long term debt as long as they are below their target leverage level. It also finds that market conditions play a big role in a firm's choice between equity and debt financing (Marsh 1982).

Chotigeat, Pandey (2004), studied the financing choices of 106 Malaysian firms and considered the role of previously mentioned variables as well. Some of this paper's findings are aligned with those of the trade off and pecking order theories, as links with debt levels are found positive for growth and size. The negative link with profitability found supports the pecking order theory. The

theory finds support for the argument that a firm with more intangible assets chooses to employ lower debt (Chotigeat, Pandey 2004).

Results of Alipour *et al.* (2015), offer support to the trade-off theory, as this paper finds a positive link between taxes and short-term leverage. Firms facing a higher tax rate, are incentivized to take up higher debt to benefit from the tax benefits, which is aligned with the Trade-off theory and Modigliani and miller's second proposition. The paper finds that liquidity, measured here by the current ratio, is positively associated with short term debt but negatively associated with long term debt ratio. When measured by working capital ratio, liquidity is negatively associated with short term and total debt. This indicates that firms prefer to use their earnings whenever possible, as stated by the pecking order theory. Financial flexibility, measured here by the ratio of retained earnings to total assets, is found to have negative association with all leverage indicators, which is consistent with POT (Alipour *et al.* 2015). Risk is negatively associated with leverage (Alipour *et al.* 2015), supporting trade-off theory findings. In general, firms seem to use more debt than equity (Alipour *et al.* 2015).

Closer to this paper's study object, Heshmati (2001) conducted a study on 2261 Swedish Small and Medium Enterprises to investigate the role variables like size, tangibility, earnings volatility, etc. play in determining their capital structure. In this paper, leverage is measured by the book value of total debt. Income variability is found insignificant. The author explains this the fact that the timeframe studied was a period of economic recovery and favourable conditions (Heshmati 2001), so this result may be different in other economic conditions. This study found that growth was negatively associated with debt. According to the author, this could be a result of the firms' preference of the use of internal funds to finance their growth or increased conflicts between shareholders' interests and those of creditors (Heshmati 2001). This provides some support to the pecking order theory. Tangibility was found positively associated with leverage in this study, reinforcing the idea that firms with more liquid asset structure can take on more debt, which is aligned with the trade-off theory idea. This study proves the applicability of the pecking order theory also through the negative link between profitability and debt. Profitability was also the most significant determining factor in the model, which could signal that firms not only use their earnings for financing but also to reduce their debt when possible (Heshmati 2001).

Lööf (2004), found the following results on its Swedish sample data. Non-tax shields were found negatively associated with leverage. Non-debt tax shields, when present, due to depreciation and

amortization, reduce the firm's incentive to use debt to benefit from the deductibility of interest payments (Lööf 2004). This supports the idea defended by theories after the MM theorem, highlighting the presence of other factors which could diminish firms' benefit from heavy borrowing. In this study as well, income volatility, while negatively associated with leverage, supporting the importance of distress costs from the trade-off theory, was insignificant for the Swedish firms studied (Lööf 2004).

Also, in the same vein, a paper by Song (2005) studied the capital structure of Swedish firms considering previously mentioned factors. The author first pointed out that Sweden is generally highly leveraged, a point also brought up by the previous study i.e., Lööf (2004). The paper found tangibility to be significantly and positively related to long term debt and negatively related to short term debt (Song 2005). This seems to be in line with the trade-off theory results. The profitability variable results fully support the pecking order theory's reasoning, as it was found to be negatively associated with both short and long-term debt, indicating a preference to use internal resources first whenever possible (Song 2005). The size variable was a significant factor in the firms' leverage and reflected the difficulty of smaller firms to access borrowing opportunities which could be due to the theorized increased information asymmetry as compared to larger firms. Uniqueness and income variability were found insignificant factors, for the sample and the period of time studied (Song 2005).

Mendell, Sydor and Mishra (2006), a study conducted on 20 firms operating in the forest products industry in the United states, focused on studying the relationship between taxes and debt, accounting for firm size as well. More specifically, the authors focused on non-debt tax shields, earnings before taxes and firm size. The findings were that these firms prefer having moderate debt levels because of their wariness of costs and risks associated with debt, and that firms with high leverage strive to reduce it (Mendell *et al.* 2006), indicating some applicability of the trade-off theory and the existence of a target debt ratio. It also found that capital structure is important for firms for this industry as investors seem to be deterred by significant amounts of debt and are more interested in the firms' growth and returns (Mendell *et al.* 2006). This study found that non-debt tax shields are positively associated with debt and that profitability is negatively associated with debt (Mendell *et al.* 2006).

From the empirical studies introduced, some convergence in findings can be detected. It seems that size and asset tangibility are generally positively associated with higher leverage, supporting

the trade-off, and pecking order theories. It seems also that while taxes do act as an incentive to take on debt, firms are still wary and consider of other aspects as well. Profitability was generally found negatively associated with leverage, asserting that firms do on average, prefer to use internal sources of financing. As for variability and growth, studies seem to have inconclusive results.

Overall, it does seem like the fundamental theories of capital structure give some insight onto how firms choose to finance their activities, but the multitude of variables, known so far, and the complexity of their interactions with leverage, make it difficult to find one unique set of determinants of capital structure.

In the following section, the data and methods used to build our model will be presented.

2. METHODS AND DATA

2.1. Sample and data collection

The data used in this model is secondary and consists of a selection of financial figures from financial statements of the sample firms, available in the Orbis Database, for the years 2011-2019. This was used to calculate the ratios and determinants needed for this paper. Due to the nature of the topic, the paper follows a quantitative approach. The sample is a group of firms operating in the Forestry and Forest-based products industry in Sweden. The final sample studied consists of 54 companies, after those whose data is significantly lacking in variables or years needed were eliminated. The sample includes different companies, including the most prominent.

The aim of this paper is to study the financing choices of the chosen companies and to assess the role of chosen variables in determining the capital choices of our study object. Differences in accounting methods used could lead to some misrepresentations or biases. Additionally, due to lack of data in some random instances, and as deleting all entries with missing information would lead to an undesired significant loss of data and information, the sample is kept unbalanced.

Financial leverage, throughout the literature has been measured differently, depending on the objective of the study (Rajan, Zingales 1995). It is most commonly measured by the ratio of debt to total assets. Empirical studies have found that using different variables for debt; separating total debt into short-term and long-term debt, gives a more accurate and detailed view and results, e.g., Titman, Wessels (1988); Chotigeat, Pandey (2004) and Alipour *et al.* (2015). Following this, this paper will also distinguish between short-term and long-term debt. Therefore, two measures for the dependent variable, leverage, will be used.

$$Short-term\ debt\ ratio\ (STD) = \frac{Short-term\ debt}{Total\ assets} \quad (1)$$

$$Long-term\ debt\ ratio\ (LTD) = \frac{Long-term\ debt}{Total\ assets} \quad (2)$$

The independent variables (expected determinants) chosen for this paper are size, liquidity, non-debt tax shield, tangibility, growth, and profitability. The selection of variables was guided by previous literature findings and data availability. All data in this thesis is based on book values. Variables are measured as shown in the table below.

Table 1. Expected determinants of capital structure

Determinant	Formula	Expected sign	Supporting theory
Size (SIZE)	ln(TA)	LTD: + / STD: -	POT
Growth (GROW)	$(TA_t - TA_{t-1}) / TA_{t-1}$	-	Agency theory
Profitability (PROF)	EBIT / TA	-	POT
Asset structure (STR)	Fixed assets / TA	+	TOT
Liquidity (LIQ)	CA / CL	-	POT
Non-debt tax shield (NDTS)	D&A / TA	-	MM

Source: Author

Notes: TA: Total Assets, EBIT: Earnings before Interest and Tax, D&A: Depreciation and Amortization, CA: Current assets, CL: Current liabilities

There are different ways in which these variables can be measured, as can be seen throughout the different studies. However, the formulas chosen seem to be the most common. An example of differing measurements could be noticed for the size variable. Besides the log of total assets, it is sometimes taken as the logarithmic value of sales, or number of employees. Some examples of studies referred to in this paper which use one, or sometimes both, of these size indicators are Lööf (2004); Heshmati (2002) and Rajan, Zingales (1995), to name a few. For this paper, it was believed that the total assets would possibly be best representative of firm size.

2.2. Descriptive statistics

In this part, a descriptive summary of the data is provided along with the correlation coefficient matrix.

Table 2. Descriptive statistics of the sample

Statistic	N	Mean	St. Dev.	Min	Median	Max
STD	483	0.417	0.243	0.001	0.383	0.958
LTD	471	0.162	0.173	0.000	0.102	0.730
SIZE	483	2.804	2.195	-2.203	2.306	7.819
PROF	482	0.056	0.072	-0.125	0.048	0.229
STR	483	0.392	0.259	0.000	0.383	0.999
NDTS	463	0.043	0.037	0.000	0.036	0.137
GROWTH	429	0.027	0.145	-0.299	0.011	0.333
LIQ	483	1.774	0.963	0.014	1.371	4.104

Source: compiled by the author based on data from the Orbis database

As can be seen from the table above, the mean ratio of short-term debt is higher than that of long-term debt, with values of 0.417 and 0.162 respectively, which shows that on average, assets are financed more by short-term debt. The maximum value of STD is from 2018 and indicates that around 96% of the concerned company's assets were financed by short term debt. The maximum LTD ratio of 73% is from 2011.

Growth for the years 2011-2019 has averaged around 2.7%. Liquidity, measured by the current ratio, has a mean of 1.774, which could indicate that the firms in this sample are well able to cover their short-term debt obligations. According to the data, profitability could be considered quite low, with a maximum level of 0.229. The industry is generally considered to be quite sensitive to unfavourable economic conditions and to have low profitability (Penttinen *et al.* 2010). Asserting whether values are high or not for the industry is difficult because industry average ratios for Sweden were not found and it was not evident to determine one "leader" company to serve as a basis of comparison.

Multicollinearity, the situation in which two or more independent variables are strongly correlated, was studied and the coefficients presented in Table 3 below were found between the regressors. From the coefficients in Table 3, there does not seem to be a strong correlation between the independent variables, the highest coefficient being 0.50. The VIF test was also conducted and returned values smaller than 2, which does not give reason for concern. Therefore, it was concluded that there is no significant multicollinearity problem to correct.

Table 3. Correlation coefficient matrix

	SIZE	PROF	STR	NDTS	GROWTH	LIQ
SIZE	1	-0.089	0.351	-0.260	-0.071	0.031
PROF	-0.089	1	0.066	0.171	0.065	0.037
STR	0.351	0.066	1	0.501	-0.030	-0.062
NDTS	-0.260	0.171	0.501	1	-0.051	-0.110
GROWTH	-0.071	0.065	-0.030	-0.051	1	-0.066
LIQ	0.031	0.037	-0.062	-0.110	-0.066	1

Source: compiled by the author based on data from the Orbis Database

Additionally, to get an idea on the trend of debt for the period studied, the below graph was made showing the average yearly values of long-term and short-term debt for the sample. The values are in million euros, and data is derived from the financial statements retrieved from Orbis Database.

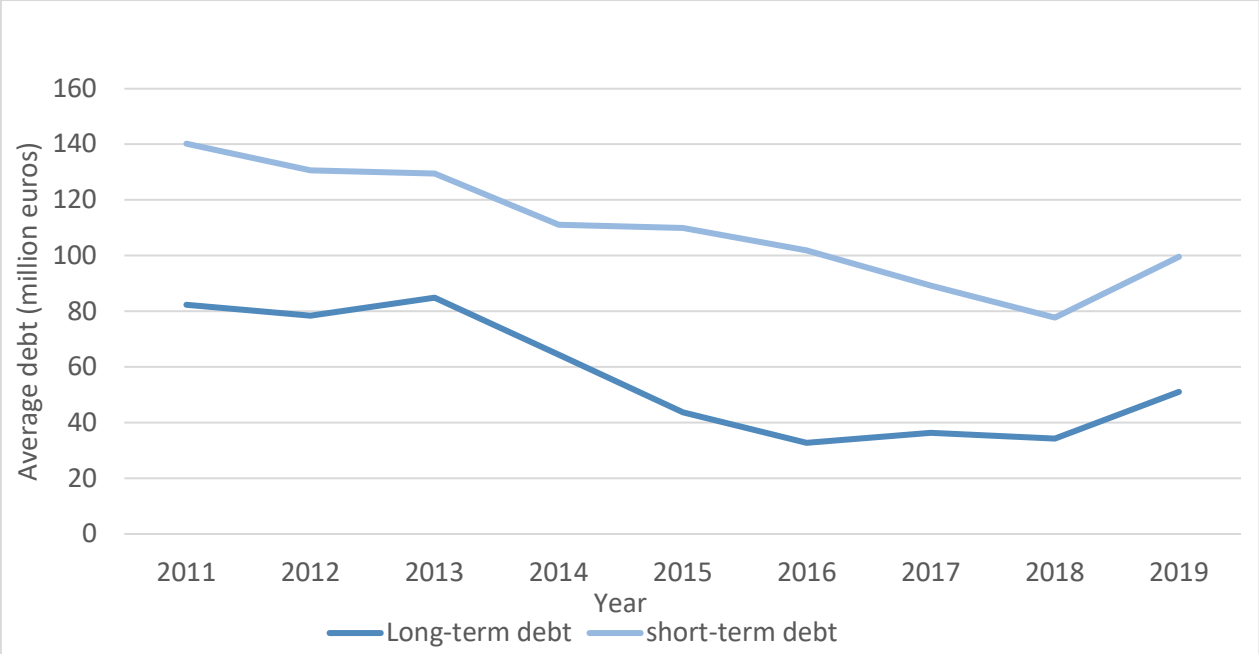

Figure 1. Average debt for sample companies (2011-2019) in million euros
Source: author's calculations based on data from the Orbis Database

It can be noticed that short term debt has remained higher than long term debt over the time frame studied. The end of year 2013 seems to mark the start of a decline in both types of debts, which is sharper for long term debt. Long-term debt hovered lightly around 33M between end of 2016 and that of 2018, while short-term debt maintained a declining trend. The end of 2018 marks an increase in both short-term and long-term debt which reach 48.5M and 51M respectively.

2.3. Methodology

The data used in this paper is panel data, consisting of 54 firms observed over a period of 9 years. Panel data provides more information, higher efficiency and offers many advantages compared to cross-section data or time-series data separately (Baltagi 2005). Usually used with panel data, but not restricted to it, are fixed effects and random effects modelling. Each approach comes with its advantages and limitations.

The fixed effects model focuses on the within variance and is seen as appropriate when dealing with a specific set of individuals or firms, and inference in this model is only applicable to the sample at hand (Baltagi 2005). The random effects model enables to extend the inferences to the population from which the sample was drawn (Baltagi 2005).

Based on Sheytanova (2014), the general equations for the Fixed effects model and Random effects model can be described by the following equations:

$$Y_{it} = \alpha_i + \beta_1 x_{1,it} + \beta_2 x_{2,it} + \cdots + \beta_n x_{n,it} + \varepsilon_{it} \qquad \text{Fixed effects model} \qquad (3)$$

Where

Y – dependent variable,
$x_{1\ldots n}$ – independent variable,
α_i – intercept for each individual,
i – individual index $1 \leq i \leq N$,
t – time index $1 \leq t \leq T$,
ε_{it} – error term,
β – estimated coefficient.

$$Y_{it} = \alpha + \beta_1 x_{1,it} + \beta_2 x_{2,it} + \cdots + \beta_n x_{n,it} + \varepsilon_{it} + u_{it} \qquad \text{Random effects model} \qquad (4)$$

Where

α – common intercept,
Y – dependent variable,
$x_{1\ldots n}$ – independent variable,
i – individual index $1 \leq i \leq N$,
t – time index $1 \leq t \leq T$,
β – estimated coefficient,
ε_{it} – error term,
u_{it} – random error.

To reiterate, the dependent variable Y in (3) and (4) is the book values of short-term or long-term debt. The independent variables x1, x2, x3, x4, x5 and x6 are size, liquidity, profitability, growth, depreciation non-debt tax shield and asset structure.

The fixed and random effects models were contrasted through Hausman test. The underlying null hypothesis H0 of the Hausman test is that the individual effects are not correlated with the model's regressor, and that the random effects model is preferred. If H0 is rejected, using fixed effect model is preferred. As shown in Table4 below, the Hausman test returned a p-value of 0.98 for the long-term debt model, and for the short-term debt model, it returns p-value < 2.2e-16. According to this, at a significance level of 5%, Hausman test suggests fixed effects is preferred for short-term debt and random effects for the long-term debt. However, results of both models are still presented.
A problem of heteroskedasticity was detected through running the Breusch-Pagan test. The results of this test and those of the Hausman test are shown below.

Table 4. Heteroskedasticity and Hausman test results

Test	Breusch-Pagan test		Hausman test	
Model	STD	LTD	STD	LTD
p-value	0.01124	4.786e-07	< 2.2e-16 (FE)	0.98 (RE)

Source: compiled by the author

At a significance level of 5% since p-values are below 0.05, H0 is not rejected and heteroskedasticity is assumed to be present. It was accounted for by estimating the heteroskedasticity and autocorrelation consistent covariance matrix.

For this paper, to handle the issue of presence of outliers, extreme values were replaced with benchmark values using the 1.5IQR rule. The next issue is endogeneity. Endogeneity is considered common in empirical finance studies and is defined as the situation in which the independent variables or regressors are correlated with the error term of the regression model (Roberts, Whited 2013). Endogeneity could lead to biased estimations, hindering the ability to make accurate inferences from the regression model results (Roberts, Whited 2013). It can originate from having omitted variables, simultaneity, or measurement error (Roberts, Whited 2013). To deal with the issue of simultaneity, lagged variables of the independent variables were used in the model. Time and firm fixed effects were used in the models as well. Since the covariance matrix and the VIF

test indicated no significant multicollinearity, no independent variable was excluded from the estimated models.

A basic robustness check was made, by observing the change in coefficient estimates when removing or adding a regressor, as this is argued to be a good practice (Lu, White 2014). The regressors more often than not kept the same behaviour, but some changes can be seen, for NDTS for example. This may to some extent, provide some support to the results found. Additional fixed effects and random effects models were estimated, introducing two macroeconomic variables to the above-mentioned independent variables. These macroeconomic factors are inflation rate and real GDP growth rate, also for the time between 2011 to 2019. This data was taken from the Knoema online database. This was used as a part of a robustness check, with the goal of seeing if significant changes would occur on the original variables chosen when introducing new regressors into the model. Variables have mostly, with some exceptions, maintained their behaviour, which provides some additional support to the results. A more detailed view of some of these results can be found in appendices 1 to 4.

The following provides the results of the Fixed and Random effects models made, followed by a discussion of the main findings.

3. FINDINGS AND DISCUSSION

In this section, the results of the regression models estimated are given and discussed. These results serve as the basis for testing the hypotheses drawn from fundamental theories on the topic, presented in part 1 of this paper. The results are then interpreted and contrasted to findings of both previous theoretical and empirical literature.

3.1. Results of the Regression models

In this paper, leverage, the dependent variable, is split into two variables to stand for short-term and long-term debt. Fixed effects models and Random effects models were estimated for both variables, and as a starting point, a basic pooling model was estimated. The table 5 below shows the model results.

The R-squared score indicates the extent to which change in the dependent variable is attributable to the independent variables in the model. While for Short-term debt, the random effects model has a higher R^2 (40.2%) than the fixed effects model (7.1%), both models are statistically significant, as indicated by the respective p-values of less than 2.22e-16 and approximately 0.0002.

Growth, liquidity, asset structure and non-debt tax shield maintain a negative association to short-term debt in the three models, but growth is not significant in the fixed effects model. The short-term debt fixed effects model results show 2 significant variables, liquidity, and profitability, while in the random effects model estimation, all variables besides profitability and size are significant with p-values smaller than 2.22e-16 each.

Table 5. Results of the regression models

	STD			LTD		
		panel linear			*panel linear*	
	Pooling	Fixed effects	Random effects	Pooling	Fixed effects	Random effects
	(1)	(2)	(3)	(4)	(5)	(6)
GROWTH	-0.099**	-0.075	-0.087**	-0.058	-0.062**	-0.058**
	(0.043)	(0.051)	(0.042)	(0.053)	(0.028)	(0.024)
LIQ	-0.157***	-0.036**	-0.098***	0.002	0.002	0.002
	(0.006)	(0.018)	(0.016)	(0.016)	(0.004)	(0.004)
STR	-0.554***	-0.120	-0.436***	0.301**	0.303***	0.301***
	(0.014)	(0.096)	(0.067)	(0.119)	(0.026)	(0.026)
NDTS	-0.655***	-0.628	-0.735**	0.602	0.594***	0.602***
	(0.144)	(0.619)	(0.326)	(0.712)	(0.143)	(0.144)
SIZE	-0.005	0.005	-0.010	-0.010	-0.010***	-0.010***
	(0.003)	(0.043)	(0.008)	(0.011)	(0.003)	(0.003)
PROF	-0.033	0.199**	0.128	-0.239*	-0.229***	-0.239***
	(0.041)	(0.098)	(0.102)	(0.137)	(0.060)	(0.060)
Constant	0.963***		0.822***	0.054		0.054***
	(0.016)		(0.044)	(0.043)		(0.019)
Observations	413	413	413	401	401	401
R^2	0.758	0.071	0.402	0.252	0.255	0.252

Notes: *** p<0.1; ** **p<0.05**; * p<0.01.

This table shows the results of the regression models for both dependent variables. Robust standard errors are provided in parentheses.

The lagged values of the independent variables are presented.

Source: compiled by the author

The right side of table 5 shows the results of the estimated regression models for the long-term debt variable. The fixed effects and random effects model have respective R^2 values of 25.5% and 25.2%. Both models are statistically significant at a confidence level of 95% with both p-values smaller than 2.22e-16. In the long-term debt models (5) and (6), asset structure and non-debt tax shield have a positive association to the dependent variable, while growth, size and profitability keep a negative association with it. All variables are statistically significant at a 95% confidence level, besides liquidity, which is not a significant variable here, unlike in the short-term debt models. Additionally, the nature of association of regressors with long-term debt stays consistent across the three modelling approaches.

While it cannot be said with absolute certainty whether this is a result of poor model quality or not, changes in sings of the estimated coefficients across models of the dependent variables were expected. Studies such as Titman, Wessels (1988) and Chotigeat, Pandey (2004) suggest that, at times, different results for short-term term as compared to long-term debt are possible since the fundamental theories on capital structure can be interpreted to have different implications on each type of debt, hence the utility in using different measures of leverage rather than a single comprehensive variable.

For each variable, the corresponding fixed effects and random effect models seem to keep relatively the same direction of association, besides size when it comes to short-term debt, for which the fixed effects model shows a positive association, and the random effects model the opposite.

3.2. Discussion of the results and hypotheses

In this section, the regression results presented above will be used to evaluate the hypotheses made, and to compare findings with the fundamental capital structure theories and previous empirical studies. The following discussion is based mainly on the random effects model results.

H1: Depreciation non-debt tax shield is negatively associated with leverage.
H1 assumes that, because non-debt tax shield reduces taxable income, firms with more non-debt tax shield will tend to have less leverage. From table 5 above, models (3) and (6), the non-debt tax shield variable (NDTS) is significant for both the short-term debt (STD) model and the long-term debt (LTD). This may indicate the relevance of tax concerns for the firms and may support the relevance of the tax basis of trade-off theory.

Model (3) shows a significant negative association between non-debt tax shield and short-term debt, with an estimated coefficient -0.735. These results are in line with Lööf (2004), which found that NDTS reduces the firms' motive to finance through debt to benefit from interest deductibility. However, this study measured leverage based on total debt only, so the specific results depending on debt maturity of debt are not known. Titman, Wessels (1988) also found that having higher non-debt tax shield reduces the debt proportion of a firms' capital structure.

Model (6) results show that non-debt tax shield has a significant positive association with long-term debt, with an estimated coefficient of 0.602. A potential explanation is offered by Mendell *et al.* (2006), a study on the forestry industry, which also found a positive association between leverage and NDTS. This was explained by the fact that, since the forestry industry is capital intensive, firms borrow funds to finance their purchases of equipment which is generally specialized. This in turn also increases their non-debt tax shields through depreciation (Mendell *et al.* 2006).

H1 which proposes that non-debt tax shield is negatively associated with leverage, is supported by the results of the short-term debt variable. This provides some evidence for the applicability of the trade-off theory. However, the long-term debt regression model results do not provide sufficient evidence to support the negative association between the two variables.
Therefore, H1 is partially accepted.

H2: Tangibility of assets (asset structure) is positively associated with use of debt.
To reiterate, H2 was drawn from the reasoning of the trade-off theory, which states that with higher tangible assets, firms would have access to more, and probably more favourable, borrowing opportunities since these assets serve as a collateral. Additionally, the more tangible assets, the lower the distress costs faced by the firms.

From the results of models (3) and (6), asset structure is statistically significant at a confidence level of 95% for both dependent variables, which suggests its importance in the firms ‘s financing decisions. The results of model (3) indicate a significant negative link between asset structure and short-term debt, through an estimated coefficient of 0.436. Chotigeat, Pandey (2004) also found a significant negative link between asset structure and the book-value of short-term debt. Conversely, results of model (6) indicate a significant positive association of asset tangibility and long-term debt, with a coefficient estimated at 0.301.

Bevan and Danbolt (2000) have found the same results for tangibility. According to this paper, this is in line with the maturity matching principle, which suggests that current assets be matched with short-term liabilities and fixed assets matched with long-term debt (Bevan, Danbolt 2000).

For this variable, Song (2005) has found the same results for both types of debt. Heshmati (2001) and Rajan, Zingales (1995), found positive correlation with total leverage, while Titman and

Wessels (1988) found tangibility to be overall insignificant. Chotigeat, Pandey (2004) found the variable insignificant for long-term debt.

The results for long-term debt are consistent with the idea behind H2 which is then partially accepted. This supports the applicability of the trade-off theory in firms' long-term financing choices. However, since tangibility showed a negative association with STD, this model's results fail to support H2 when short-term debt is concerned.

H3: Size is positively associated with leverage.

H3.a: Size is positively associated with the use of long-term debt.

H3.b: Size is negatively associated with the use of short-term debt.

In this paper, size is measured as the logarithm of total assets. From the results of model (3), size is not a statistically significant determinant for Short-term debt. As for the Long-term debt dependent variable, model (6) shows that size has an estimated coefficient of -0.010 and is significant at a 99% confidence level. Size then has a significant negative association with long-term debt.

Rajan, Zingales (1995) generally finds size to be positively associated with leverage, besides its German model. Lööf (2004) also finds a positive link between the two variables for its Swedish and German samples, but a negative link between the two for its US sample.

Following the trade-off theory, larger firms were expected to tend towards long-term debt as they are considered to have a larger debt capacity, able to obtain favourable terms, and have lower distress and agency costs, hence H3. In this model, that does not seem to hold, and so the results do not offer support for the applicability of trade-off theory.

However, as previously mentioned, literature has had conflicted views and results on the relationship between firm size and capital structure. The pecking order theory seems to offer an opposing view to that of trade off theory, in this regard. Rajan, Zingales (1995), proposes that because larger firms tend to have lower information asymmetry, equity might become a more attractive and approachable financing option for them as opposed to smaller firms for which issuing equity might be costly. Heshmati (2001), also suggests that larger firms may have easier access to equity markets, encouraging equity financing, rather than debt financing. This could explain the negative relationship between firm size and leverage, and so, the results of models (3)

and (6) suggest that pecking order theory may be relevant in the financing decision making in this case.

Moreover, the results of the size variable models may indicate some debt conservatism and general desire to maintain moderate to low levels of debt to avoid its risks. This seems rather reasonable considering the volatility of the industry, and which according to Hetemäki, Hurmekoski (2016) has witnessed, and probably would continue to face, many changes. Mendell *et al.* (2006), a study on American companies in the same industry, also found a negative association between size and leverage. Mendell *et al.* (2006) suggests that firms may prefer to keep moderate debt levels in general. Consequently, H3.a and H3.b are rejected.

H4: Growth is negatively associated with use of debt.
Growth is measured as the growth in total assets. According to the agency costs theory, firms with high growth face higher agency costs as the value of these growth opportunities does not constitute a collateral strong enough to facilitate accessing debt opportunities (Myers 2001). This may deter them from using debt as a source of financing, and these firms tend towards equity financing (Myers 2001).

Table5 shows that growth is statistically significant variable across the two models (3) and (6), at a significance of 5%, and that it maintains a negative association with both dependent variables. Results of model (3) indicate a significant negative link between growth and STD with a magnitude of 0.087. Model (6) results also indicate a significant negative link between LTD and growth with a magnitude of 0.058, which suggest that firms with more growth tend to utilize less debt.

Heshmati (2001), a study on Swedish SMEs also found a significant negative link between growth and leverage. This result may be explained by the preference of equity financing by firms expecting higher growth as they tend to have many financing options at their disposal, or by their preference to use internal resources to finance growth (Heshmati 2001). Alipour *et al.* (2015) also found a negative association between expected growth and both types of leverage. On the other hand, Chotigeat, Pandey (2004) shows a positive and significant relationship between growth and market and book values of long-term debt, but growth seems to have been insignificant for short-term in this study. Titman, Wessels (1988) found a positive link with book value of long-term debt. Also, Michaelas *et al.* (1999) found a positive, and significant, link between growth and leverage.

Since the nature of association with leverage shown by the growth variable is consistent with what was expected, H4 is accepted, and relevance of agency cost theory is supported.

H5: Profitability is negatively associated with leverage use.
H5 was drawn from the pecking order theory which stipulates the absence of a target debt ratio and a general preference to use internal resources as a source of financing before moving on to debt and then finally to equity (Myers, Majluf 1984).
From Table 5, profitability seems to have mixed results. The pooling model of short-term debt and the long-term models exhibit a negative association between profitability and leverage use, while the short-term debt fixed and random effects models show a positive association.
Profitability is statistically significant in all the long-term models and in the fixed effects short-term debt model, at a significance level of 5%.

As stated, model (3) shows that profitability is insignificant for short-term debt. The results of model (6) show that profitability is significantly negatively associated with long-term debt, with a magnitude of 0.239. This suggests that more profitable firms tend to use less long-term debt as a source of financing, and that, as hypothesized, profitability is negatively associated with leverage. This could advocate for the preference to follow the pecking order theory hierarchy of financing sources and tendency to use internal financing whenever available. Additionally, this goes against the idea of firms being motivated to use debt in order to capture tax benefits which is implied by the trade-off theory for profitable firms, which are considered better equipped to handle debt risks.

The same results were found by Rajan, Zingales (1995), Chotigeat, Pandey (2004), Heshmati (2001) and Song (2005). Overall, H5 is supported by the long-term models results and the fixed effects of short-model and therefore is at least accepted in case of long-term debt.

H6: Liquidity is negatively associated with use of debt.
Liquidity, measured by the Current ratio, reflects the firm's ability to meet its shorn-term obligations. Following the pecking order theory, as was the case in drawing H6, would lead to expecting that higher leverage is associated with low leverage levels, because of the preference to use internal funds over other sources. The trade-off theory suggests the opposite; that more liquid firms, able to bear the risks, would be inclined to use higher leverage.

Results of all short-term models, but none of the long-term debt models, show that liquidity is a significant variable at a confidence level of 95%. Model (3) from table5, shows that liquidity has a negative link with short-term debt, with a magnitude of 0.098. Alipour *et al.* (2015) find a negative link with long-term debt and the current ratio and opposite results for the short-term variable. The results of the model provide support for H6 in the case of short-term debt, and so H6 is accepted in that case, and the pecking order theory is applicable.

CONCLUSION

This paper aimed to study the financing choices made by Swedish firms in the forest and forest products industry, and to test the applicability of the fundamental theories of capital structure.

The panel data used for this paper was compiled from financial statements of the sample firms, retrieved from the online Orbis Database. The sample consisted of 54 Swedish firms in this industry and the data covered the years 2011 to 2019. This is due to data availability constraints which have made it so that, while it would have been interesting, the full business cycle could not be covered.

The potential determinants tested by this study were size, liquidity, asset structure, non-debt tax shield, growth, and profitability. The dependent variables were short-term and long-term debt. Variables were calculated as shown in Table1 formulas and were based on previous literature. All are in book value terms. Other studies like Chotigeat, Pandey (2004) etc., using both market and book values have had some interesting and contrasting results, which suggests that using market values could provide more information, if these are available. Lööf (2004) also uses market value of leverage.

Mainly, four regression models were estimated, using fixed effects and random effects approaches. In an initial stage, pooling models were also estimated. The software used for this was R. Due to the nature of the industry, including a variable of volatility may have been a wise decision, but finding a good way to measure this could not be done in time to be included.

To recapitulate the main results found, the random effects models indicate that size and profitability are not significant when short term debt is concerned. Also, liquidity, non-debt tax shield, growth and asset tangibility show a significant negative association. The long-term debt random effects results show that liquidity is not significant, while size, growth and profitability

are significantly negatively to long-term debt. Non-debt tax shield and asset structure show the opposite significant association.

Overall, the results of the models supported the hypotheses, though sometimes only for one dependent variable. H3, the assumption that size is positively with leverage, was not supported by any of the models, which may be explained by a tendency to keep debt levels moderate to low or choosing equity financing.

At times, differences can be detected between the results of both dependent variables, as is the case for non-debt tax shield for example. The latter is significantly negatively associated with short-term debt and significantly positively associated with long-term debt, both with rather large magnitudes, which could show the utility in using both short and long-term debt variables.

Altogether, the results indicate that the tested variables are at least part of the determinants of capital structure decisions. As the matter of capital structure is complex, there are many other factors that could come into play, such as macroeconomic variables, industry and country specific factors and financial market situation, etc, which were not a part of this paper. Heshmati (2001), a study on Swedish SMEs found that also location within Sweden had some effect on leverage levels. Including these factors in models, if possible, would enrich findings and understanding of the topic greatly.

To conclude, it can be said that the fundamental theories are are well applicable to the financing decisions of Swedish firms in this industry. The findings for profitability, size and liquidity signal the overall preference to use internal funds when available, before resorting to other sources, which hints at the relevance of the pecking order theory, perhaps even more than other theories. The results found for non-debt tax shield hypothesis when it comes to short-term debt and that of asset structure when it comes to long-term debt seem to be in line with the trade-off theory propositions. Moreover, the results of the growth hypothesis testing are supported by the agency costs theory. The results from the size hypothesis testing may signal to a certain extent some debt conservatism, also perhaps supported by the overall relevance of the pecking order theory. This also goes to show that financing decisions are made carefully and with wariness of the risks of debt taking, even when the firms are profitable and tax benefits appealing.

Finally, since the industry is export-oriented and generally sensitive to economic changes, it would be interesting to see, when data availability permits, how the COVID-19 pandemic has affected financing decisions of these firms in general, as logistical, and overall economic challenges are heightened. A study involving more industry-specific factors would also provide some interesting insight into how these elements can alter the results.

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APPENDICES

Appendix 1. Robustness check: Results with the macroeconomic variables

	STD			LTD		
		panel linear			*panel linear*	
	Pooling	Fixed effects	Random effects	Pooling	Fixed effects	Random effects
	(1)	(2)	(3)	(4)	(5)	(6)
GROWTH	-0.101**	-0.078	-0.091**	-0.053	-0.062**	-0.084*
	(0.044)	(0.050)	(0.041)	(0.053)	(0.028)	(0.046)
LIQ	-0.157***	-0.035*	-0.098***	0.002	0.002	0.031***
	(0.006)	(0.018)	(0.016)	(0.016)	(0.004)	(0.011)
STR	-0.555***	-0.120	-0.438***	0.302**	0.303***	0.201**
	(0.014)	(0.094)	(0.066)	(0.119)	(0.026)	(0.078)
NDTS	-0.653***	-0.695	-0.753**	0.601	0.594***	0.230
	(0.142)	(0.628)	(0.327)	(0.711)	(0.143)	(0.555)
SIZE	-0.005	0.001	-0.010	-0.010	-0.010***	-0.000
	(0.003)	(0.045)	(0.008)	(0.011)	(0.003)	(0.009)
PROF	-0.038	0.191**	0.118	-0.233*	-0.229***	-0.024
	(0.039)	(0.097)	(0.101)	(0.137)	(0.060)	(0.106)
INF	0.485*	0.824	0.769	-1.354*		-1.302**
	(0.266)	(0.602)	(0.643)	(0.706)		(0.622)
GDP	0.264	0.120	0.244	-0.357		-0.399
	(0.169)	(0.315)	(0.308)	(0.374)		(0.314)
Constant	0.954***		0.813***	0.072*		0.040
	(0.017)		(0.046)	(0.043)		(0.039)
Observations	413	413	413	401	401	401
R^2	0.758	0.076	0.406	0.255	0.255	0.093

Notes: *** p<0.1; ** **p<0.05**; * p<0.01.

This table shows the results of the regression models for both dependent variables. Robust standard errors are provided in parentheses

The lagged values of the indendent variables are presented

Appendix 2. Robustness check: Results without the variable LIQ

	STD			LTD		
	Pooling	Fixed effects	Random effects	Pooling	Fixed effects	Random effects
	(1)	(2)	(3)	(4)	(5)	(6)
PROF	-0.137	0.188*	0.156	-0.238*	-0.228***	-0.238***
	(0.094)	(0.104)	(0.112)	(0.136)	(0.062)	(0.062)
SIZE	-0.008**	0.002	-0.022*	-0.010	-0.010***	-0.010***
	(0.003)	(0.047)	(0.012)	(0.011)	(0.003)	(0.003)
NDTS	-0.230	-0.850	-1.146**	0.595	0.589***	0.595***
	(0.170)	(0.715)	(0.548)	(0.715)	(0.135)	(0.136)
GROWTH	-0.022	-0.068	-0.062*	-0.060	-0.062**	-0.060**
	(0.082)	(0.050)	(0.034)	(0.054)	(0.029)	(0.025)
STR	-0.538***	-0.025	-0.121*	0.301**	0.303***	0.301***
	(0.022)	(0.073)	(0.070)	(0.119)	(0.026)	(0.026)
Observations	413	413	413	401	401	401
R^2	0.385	0.039	0.084	0.252	0.254	0.252

Notes: *** p<0.1; ** **p<0.05**; * p<0.01.

This table shows the results of the regression models for both dependent variables. Robust standard errors are provided in parentheses

The lagged values of the indendent variables are presented

Appendix 3. Robustness check: Results without the variable SIZE

	STD			LTD		
	Pooling	Fixed effects	Random effects	Pooling	Fixed effects	Random effects
	(1)	(2)	(3)	(4)	(5)	(6)
LIQ	-0.157***	-0.036**	-0.100***	0.002	0.001	0.002
	(0.006)	(0.018)	(0.015)	(0.016)	(0.005)	(0.005)
STR	-0.580***	-0.117	-0.468***	0.251***	0.252***	0.251***
	(0.018)	(0.091)	(0.057)	(0.087)	(0.016)	(0.016)
NDTS	-0.495***	-0.639	-0.548*	0.926*	0.920***	0.926***
	(0.146)	(0.647)	(0.283)	(0.489)	(0.110)	(0.111)
PROF	-0.029	0.200**	0.130	-0.229	-0.219***	-0.229***
	(0.044)	(0.100)	(0.100)	(0.144)	(0.053)	(0.052)
GROWTH	-0.093**	-0.072**	-0.088**	-0.046	-0.049*	-0.046*
	(0.046)	(0.036)	(0.042)	(0.053)	(0.029)	(0.025)
Constant	0.953***		0.803***	0.032		0.032**
	(0.015)		(0.047)	(0.038)		(0.013)
Observations	413	413	413	401	401	401
R^2	0.756	0.071	0.400	0.242	0.244	0.242

Notes: *** p<0.1; ** **p<0.05**; * p<0.01.

This table shows the results of the regression models for both dependent variables. Robust standard errors are provided in parentheses.

The lagged values of the independent variables are presented.

Appendix 4. Robustness check: Results without the variable GROWTH

	STD			LTD		
	Pooling	Fixed effects	Random effects	Pooling	Fixed effects	Random effects
	(1)	(2)	(3)	(4)	(5)	(6)
LIQ	-0.144***	-0.021*	-0.068***	0.001	0.000	0.001
	(0.012)	(0.012)	(0.013)	(0.015)	(0.005)	(0.005)
STR	-0.494***	-0.013	-0.203***	0.271**	0.275***	0.271***
	(0.064)	(0.076)	(0.073)	(0.116)	(0.034)	(0.034)
NDTS	-0.567***	-0.051	-0.311	0.546	0.538***	0.546***
	(0.137)	(0.447)	(0.389)	(0.664)	(0.150)	(0.149)
SIZE	-0.005*	-0.008	-0.009	-0.009	-0.009***	-0.009***
	(0.003)	(0.009)	(0.009)	(0.010)	(0.003)	(0.003)
PROF	-0.007	0.185**	0.116	-0.252*	-0.242***	-0.252***
	(0.058)	(0.092)	(0.098)	(0.135)	(0.052)	(0.052)
Constant	0.907***		0.652***	0.069*		0.069***
	(0.050)		(0.047)	(0.038)		(0.024)
Observations	459	459	459	447	447	447
R^2	0.629	0.041	0.221	0.204	0.208	0.204

Notes: *** p<0.1; ** **p<0.05**; * p<0.01.

This table shows the results of the regression models for both dependent variables. Robust standard errors are provided in parentheses.

The lagged values of the independent variables are presented.

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