Financial Leverage and Firm Performance among Listed SMEs in Sweden

Jeppe Rask Andersen

(20194650)

and

Patrick Kondrup Mørup

(20195398)

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Supervisor: Frederik Steen Lundtofte

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Abstract

This thesis aimed to investigate the relationship between financial leverage and firm performance among publicly listed Swedish SMEs from 2019 to 2023. Using fundamental capital structure theories, including Modigliani-Miller Theorems, Trade-off Theory, Agency Theory, and Pecking Order Theory, as well as drawing on previous empirical studies, the aim was to highlight the interplay between financial leverage (short-term debt, long-term debt, and debt-to-equity ratios) and firm performance (Return on Assets, Return on Equity, and Tobin's Q). Furthermore, Firm Size (log of Total Assets) and Sales Growth (Q/Q Revenue Change) were mediating variables. Fixed Effects was employed as the primary method estimation method, with Pooled Ordinary Least Squares, Random Effects, and System GMM as robustness checks. The baseline results (Fixed Effects) and estimations made for robustness revealed an overall negative relationship between financial leverage and firm performance, suggesting the need for listed Swedish SMEs to consider their capital structure decisions carefully. Hence, these results have contributed to the existing literature by highlighting the leverage dynamics for listed SMEs while also providing insights for policymakers, managers, and other stakeholders involved in financing listed SMEs.

Abbreviations

Small and Medium-Sized Enterprise: SME

Debt to Equity (Book): DEB

Debt to Equity (Market): DEM

Short-term debt / Total assets: STD

Long-term debt / Total assets: LTD

Total debt / Total assets: TD

Log of Total Assets: TA

Firm Size: FS

Sales Growth: SG

Return on Equity: ROE

Return on Assets: ROA

Tobin’s Q: TQ

Pooled OLS: POLS

Random effects: RE

Fixed effects: FE

Generalized Method of Moments: GMM

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2 Introduction

Is financial leverage a good predictor of firm performance? Over the past decades, empirical studies have intensely debated this relationship, where the interest in explaining the relevance of leverage comes from the extant literature on capital structure theory; their seminal paper (Modigliani & Miller, 1958) posits that leverage has no relation to firm value. This theorem was, however, based on the assumption of perfect capital markets, which paved the road for new theories addressing some of these restrictive assumptions, such as the pecking order theory, agency theory, and the trade-off theory. While significant in their own right, these theories may not be comprehensive enough to fully explain the complex relationship between leverage and firm performance in diverse market environments. In turn, mixed results have been found across a wide range of samples, revealed through an extensive literature review. This also suggests that the question is still widely unanswered and dependent on more factors than just the simple relationship between leverage and firm performance. With this in mind, variables thought to indirectly affect firm performance, such as firm size and sales growth, are becoming increasingly apparent in empirical studies trying to answer this research question.

Although studies have been conducted on many different country samples, the existing literature has mainly focused on the Asian region (Detthamrong et al., 2017; Le & Phan 2017; Chakraborty, 2010). Furthermore, large firms, SMEs, and listed and unlisted firms have been studied. However, few studies have investigated this relationship in Sweden (Kachlami & Yazdanfar, 2016; Yazdanfar & Öhman, 2015). Furthermore, no studies have focused explicitly on listed SMEs in Sweden. Generally listed Swedish SMEs have had favorable conditions in recent years, and the Swedish equity markets for SMEs are seen as one of the most well-functioning in Europe, characterized by active trading and a strong investor culture (Knight, 2021).

The main alternative to equity financing is debt financing, which, for SMEs, is not always easy to obtain. One of the apparent reasons for this is the interest rate gap for debt financing between the larger and smaller companies, which has been significant and resulted in unfavorable costs for the smaller segment of the listed companies in Sweden. Furthermore, many of these firms are at a stage where revenue is sparse or non-existent, and collateral is limited to a few assets, as a significant portion of firm value is tied to research and development. Equity financing is a valuable alternative when this is the case. However, the need for debt financing can still be high when there is uncertainty in the equity market, which we have seen several times in the

past five years. This has led to the inevitable question of how leverage financing affects the performance of listed Swedish SMEs.

This study is based on a comprehensive panel sample of listed Swedish SMEs, encompassing a range of leverage and performance proxies. The primary objective of the thesis was to provide new empirical evidence and strengthen the existing mixed empirical findings by testing seven hypotheses. To do this, the right method had to be applied, and the thesis settled on using the fixed effects model for inference of the baseline results, as well as pooled OLS, random effects, and system GMM for robustness checks. The fixed effects estimation method was chosen due to its properties and the ability to control for unobserved time-invariant characteristics of the firms included in the sample. The baseline results indicated a mixed relationship between different combinations of leverage and firm performance proxies. However, they pointed toward an overall negative relationship between leverage and firm performance of listed Swedish SMEs from 2019 to 2023.

This leads to the main contributions. This thesis stands out as the first of its kind, solely focusing on the listed SMEs in Sweden. Earlier empirical studies have used data samples that have not distinguished between listed and private Swedish SMEs. In these studies, the overall findings were mixed. Therefore, the more focused contribution made in this thesis provides a unique and valuable perspective. In addition to the more focused approach, the sample is based on the latest data and information available and in a later period than most previous studies. That is, utilizing the latest financial information, including all four quarters of 2023, which highlights the dynamics of financial leverage and firm performance in the most recent years. Furthermore, as there seems to be a difference between developing and developed markets in this respect, this thesis adds to the evidence regarding developed markets.

3 Characteristics of the Swedish Stock Market

This section will discuss relevant aspects of the Swedish stock market and how it has developed. The Swedish stock market consists of four exchanges: the primary exchange, Nasdaq Stockholm, and three small-cap exchanges: First North Growth Market, Spotlight, and Nordic Growth Market. The focus will mainly be on the First North Growth Market exchange, which is by far the largest of the small-cap exchanges.

3.1 Regulatory Environment

One of the critical parts needed to understand the Swedish stock market revolves around the regulatory environment and governance of the different stock exchanges within Sweden. According to Finansinspektionen, the regulator for banking, securities, and insurance sectors in Sweden, regulating financial markets aims to ensure transparency, stability, and investor protection (Finansinspektionen, 2022). Rules and regulations apply to all financial markets, but the degree to which these are enforced and the specific areas they cover tend to vary. This is also the case in Sweden, and the requirements placed on the company depend on whether the company's securities are traded on a regulated exchange, such as Nasdaq Stockholm, or a multilateral trading facility (MTF) like Nasdaq First North Growth Market. The critical difference is that regulated markets are subject to more stringent regulatory requirements compared to MTFs. Hence, an MTF exchange typically attracts small and medium-growth companies from sectors such as technology, pharma, and mining (Baker Mckenzie, 2024).
Furthermore, it is accepted that many smaller companies utilize small markets, such as the Nasdaq First North Growth Market, as stepping stones to prepare for eventually listing on the Nasdaq Stockholm or Nasdaq First North *Premier* Growth Market. Like the regular Nasdaq First North Growth Market, Nasdaq *Premier* First North Growth Market is also an MTF; however, it is intended for companies with a higher degree of ambition and will prepare the company for a Main Market listing as many of the listing requirements are aligned with those of the Main Market (Nasdaq, 2021). This also emphasizes that individual exchanges may tailor the regulatory requirements to obtain specific exchange characteristics.

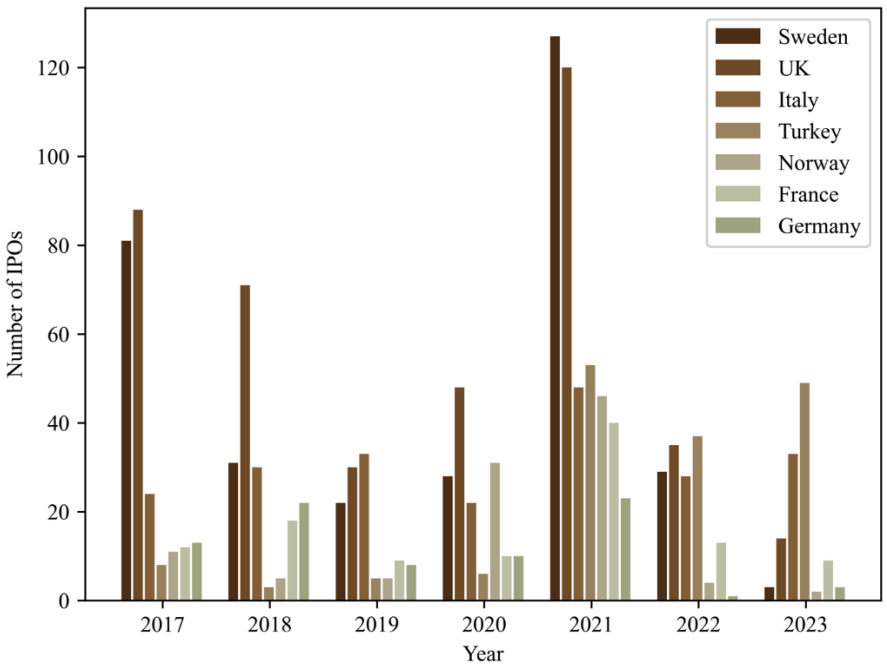
Furthermore, the choice of exchange has implicit implications for critical factors such as the broadness of the investor base, media exposure, and liquidity. Although there is less trading activity on exchanges such as Nasdaq First North Growth Market than Nasdaq Stockholm,

these smaller markets have been subject to a surge in popularity (Baker Mckenzie, 2024). This includes increasing interest from investment banks, institutional investors, and private equity firms. This also coincides with the general investor culture surrounding Swedish SMEs, which will be elaborated on later. Regarding retail participation on the smaller exchanges, data shows that retail investors are highly involved in small caps, indicated by the trading volume attributed to retail investors as a percentage (29.6%) of total trading volume on Nasdaq First North (Nasdaq, 2022). This suggests that individuals are willing to take the risk associated with the securities traded on these smaller exchanges (Nasdaq, 2022). This factor also makes Swedish exchanges optimal for IPOs, which will be examined in the next section.

3.2 European IPOs

A deeper insight into the IPO market is needed to understand the characteristics of the European stock market and especially the Swedish stock market, as this is the preliminary step for SMEs to get listed on an exchange. The number of IPOs indicates the conditions for SMEs that want to access the public equity markets. As seen in Figure 3.1, Sweden is one of Europe's largest IPO markets, with 17% of all IPOs since 2017. According to Bloomberg, only the UK has had more IPOs, with 21% of all European IPOs since 2017 (Bloomberg, 2024).

Figure 3.1: Europe's Biggest IPO Markets



Source: Bloomberg (2024) and own contribution

Although the UK has had more IPOs than Sweden, some of the biggest economies in Europe are still trailing after Sweden. This includes Germany, France, and Norway - all having around 5% each of the IPOs in Europe since 2017. The comparison between Sweden and some of Europe's biggest economies indicates how active the stock market is in Sweden. There are several reasons why Sweden's IPO market is particularly strong. The active investor base is one of those reasons, especially in the SME market. This is also confirmed by Knight (2021), who stated the following:

> *"According to reports from the European Market Regulator ESMA, Sweden alone accounts for more than 40% of European SME trading volumes"*

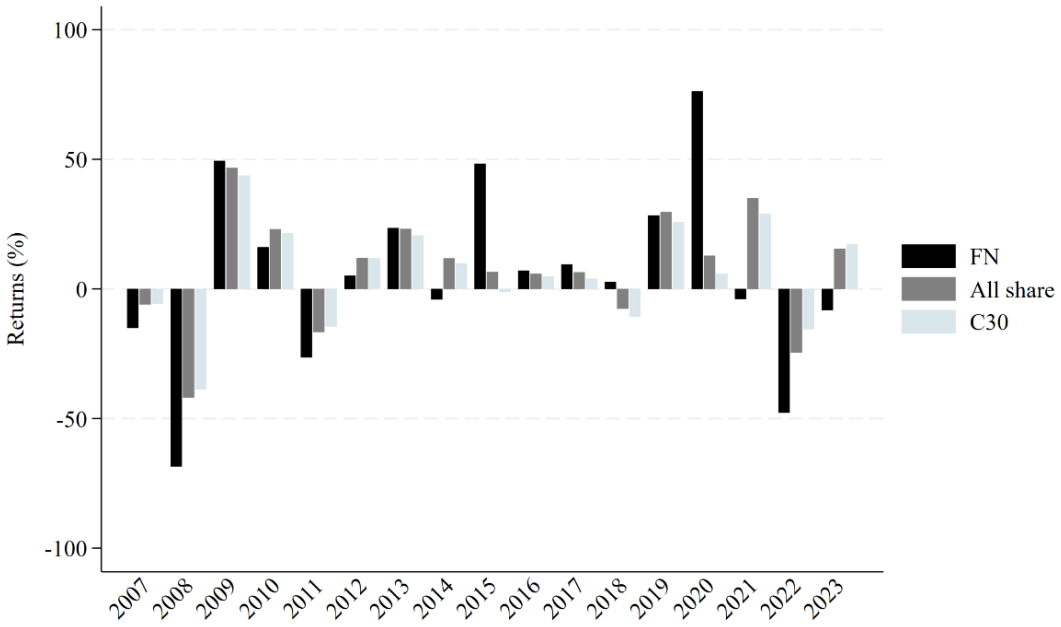
With active investors and higher liquidity, there is a higher likelihood that Swedish SMEs can secure equity financing, thereby enhancing the chances of both efficient funding and success.

3.3 Sweden Stock Market Returns

To understand the characteristics of the Swedish Stock Market, it is essential to understand the historical market returns. To illustrate this, three indices will be used: the Stockholm All Share Index, which contains all Swedish stocks; the First North All Share Index, which contains most of Sweden's small caps; and the OMXS30, which includes the 30 most prominent companies in Sweden.

The Stockholm All Share index has delivered an 11% average annual return with dividends reinvested from 1987 until 2023. Compared to the First North All Share index, this is substantially higher, as this index delivered a 4.9% average annual return with dividends reinvested since 2007. Comparing the first two indices from 2007 to 2023, the Stockholm All Share Index still delivered higher average annual returns of 8.6% with dividends reinvested. Based on this, the small-cap has underperformed relatively to the large-cap in Sweden. To further prove the statement, the returns of the OMXS30 index in the period from 2007 to 2023 can be looked at; OMXS30 has delivered a 7% average annual return with dividends reinvested in the period (Bloomberg, 2024), confirming the relative outperformance of large caps compared to small caps in Sweden.

Figure 3.2: Sweden Stock Market Returns



Source: Bloomberg (2024) and own contribution

Figure 3.2 shows Sweden's small-cap volatility compared to the two other indices. Especially in less stable macroeconomic conditions, Swedish small caps seem to overreact to the macroeconomic instabilities seen in 2008 during the financial crisis, during COVID-19, or in 2022 during the Ukraine war.

3.4 Development of the SME Market

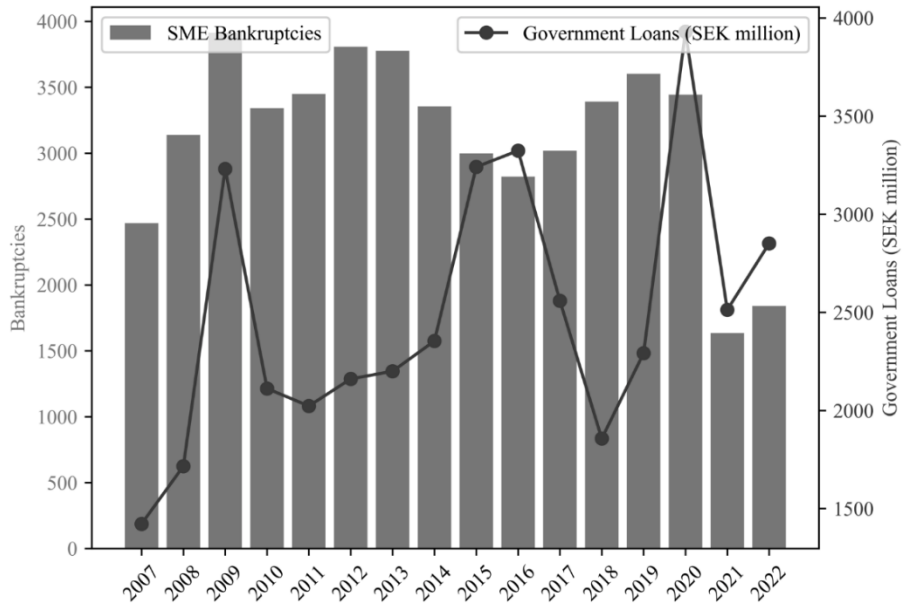
As mentioned earlier, we see a tendency of many IPOs, but lower market-based performance of Swedish small-caps compared to large-caps. To further enlighten the tendencies, this section will clarify the development of the SME market and further manifest the differences between SMEs and larger companies.

The SMEs dominate the business landscape in Sweden, representing 99% of all companies in Sweden (both private and listed). The Swedish SMEs account for 59% of the total employment and 45% of Sweden's GDP (OECD, 2024). Regarding the development of the SME market, the OECD concluded in their 2022/2023 report that Sweden has a highly favorable environment for SMEs relative to other European Union members at the time (OECD, 2023). This was

mainly due to a low administrative burden for start-ups and access to finance compared to the general level in the European Union.

The Swedish SME market is driven by innovative entrepreneurs and supported by government policies such as entrepreneurship education, coaching, and labor market measures. These innovative entrepreneurs saw favorable conditions in 2020 and 2021, as shown in the sharp decline in bankruptcies from 2020 to 2021 in Figure 3.3. The main reason for this was the effectiveness of government initiatives during and after the pandemic, which significantly impacted the survival of many Swedish SMEs (OECD, 2024).

Figure 3.3: Bankruptcies and Government Loans in SEK million (2007-2022)



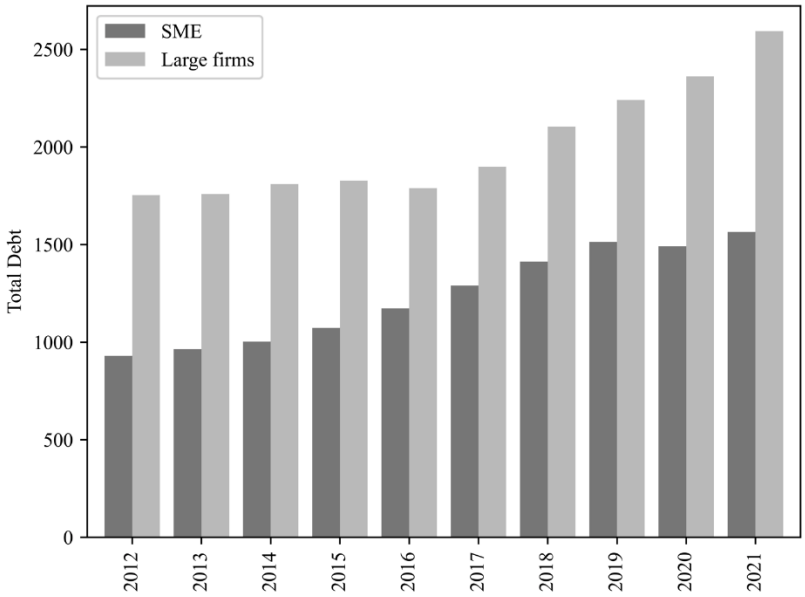
Source: (OECD, 2024) and own contribution

Many governments worldwide have taken initiatives to provide so-called "COVID loans," and the Swedish government was no different. This is shown in the direct government loans to SMEs, which doubled from 2019 to 2020 in Sweden (OECD, 2024).

Regarding the financing of Swedish firms, total SME debt in 2021 was 1.564 trillion out of the total debt to Swedish companies of 4.157 trillion. In 2021, which was, as mentioned, a particular year for Swedish SMEs, non-government lending increased by 5% and total business lending by 7% (OECD, 2024). This indicates a robust financial landscape for both Swedish SMEs

and Sweden's broader growth of financing possibilities. Figure 3.4 shows a breakdown of total debt among SMEs and large firms.

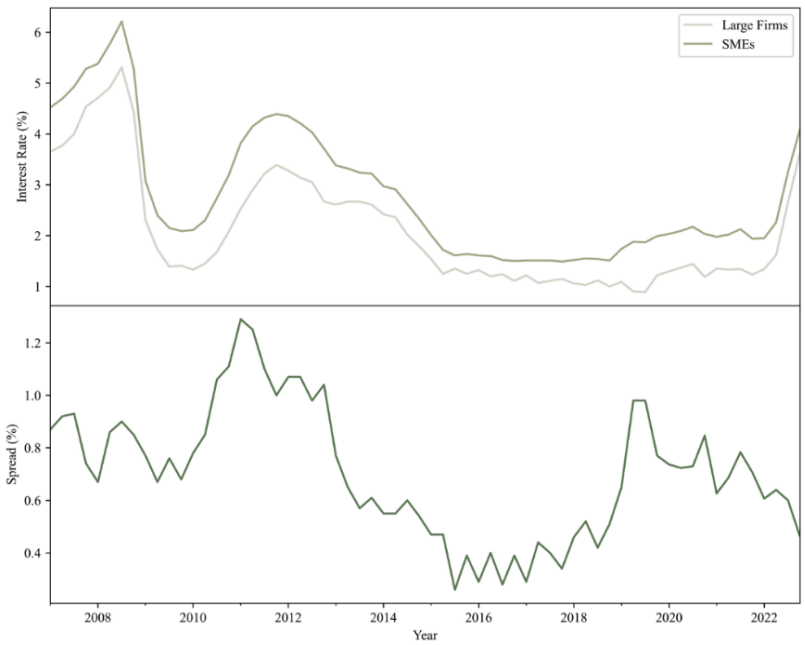
Figure 3.4: Total Debt SMEs vs Large Firms



Source: (OECD, 2024) and own contribution

To understand the difference in the cost of debt between SMEs and larger firms, one can look at the bank lending interest for both categories in Figure 3.5 below.

Figure 3.5: Interest Rate & Spread for SMEs and Large Firms



Source: (OECD, 2024) and own contribution

Figure 3.5 shows a fluctuating spread between the bank interest rate for SMEs and larger firms. In recent years, from 2019 to 2022, there has been a notable increase in the interest spread, which is a definite signal of higher borrowing costs and potential problems for SMEs in securing loan financing (OECD, 2024).

In conclusion, the previous sections have helped shed light on why Sweden might be considered one of the best markets for SMEs. First, SMEs in Sweden have access to exchanges tailored explicitly to SMEs due to their relatively more straightforward compliance needs. This was also reflected in the number of IPOs relative to some of Europe's biggest economies. The dominant presence of SMEs in Sweden also has the interest of government bodies, which ensures that specific policies are geared towards the needs and growth of SMEs. Regarding market support for SMEs, retail investors' high trading volume participation increases the likelihood of securing equity financing. However, the returns of small caps compared to large caps still favor large caps, especially in more stable environments. It is seen that the amount of government loans had a significant spike after the COVID-19 outbreak, and the Swedish government had to step in to save several SMEs, which is also displayed by the drop in bankruptcies in the following years afterward. This observation could indicate the importance of debt for the Swedish SMEs. One consideration SMEs have to make is the interest rate compared to the larger firms, which is significantly different when looking at the interest rate spread favoring the larger companies. One of the reasons is the limited collateral SMEs have to offer to obtain debt financing (OECD, 2024). On the other hand, this could be one of the reasons for the thriving equity market in Sweden. Overall, this development of the SME market and the substantial number of IPOs have resulted in Sweden being Europe's most significant listed SME market, with 555 SMEs. This corresponds to Sweden having 16% of the listed SMEs in Europe (Bloomberg, 2024).

4 Literature Review

The following chapter discusses capital structure theory and previous studies regarding different forms of leverage and firm performance. Sections 4.1 and 4.2 focus on the theories of capital structure and firm performance, whereas section 4.3 provides an overview of the studies that address this thesis's research question. Section 4.4 develops several testable hypotheses based on the previous empirical results presented in section 4.3.

4.1 Capital Structure

One of the most critical corporate financing decisions firms must make is the relative weight of equity and debt in their financing mix. For several years, optimal capital structure has been studied to understand how firms can alter their financing mix to maximize firm value. The following section examines the main capital structure theories to provide the foundation for understanding the drivers of capital structure decisions. Table 4.1 provides an overview of the main capital structure theories, which will be discussed in further detail throughout section 4.1.

Table 4.1: Overview of Capital Structure Theory

Author	Summary/Mechanism	Impact on Firm Performance
Modigliani & Miller (1958)	M&M proposition I & II. Proposition I states the irrelevancy of capital structure, while Proposition II states that the cost of equity increases as leverage increases.	Neutral
Modigliani & Miller (1963)	M&M acknowledged that taxes played a role and revised their 1958 paper by adding the component of a tax shield on debt.	Positive
Kraus & Litzenberger (1973)	Introduced trade-off theory and a model to determine the optimal capital structure, balancing tax benefits and costs of bankruptcy risks.	Positive
Jensen & Meckling (1976)	Leverage mitigates agency costs between shareholders and managers but can increase agency costs between shareholders and debtholders.	Mixed
Donaldson (1961)	Focused on how companies prefer internal funds over external funds, which set the foundation for the pecking order theory.	Negative
Myers & Majluf (1984)	Popularized the pecking order theory, stating that firms follow a hierarchy of funding choices to minimize adverse selection.	Negative

4.1.1 Modigliani-Miller Theorem

Many scholars consider Modigliani & Miller's 1958 paper the beginning of modern capital structure theory (Modigliani & Miller, 1958). Their seminal paper examined capital structure concerning firm value by showing under what conditions capital structure is irrelevant (Harris & Raviv, 1991). This result was a part of three M&M propositions in their original paper[1], which was later followed by a revised version in 1963 (Modigliani & Miller, 1963).

M&M's Proposition I state that in perfect capital markets,[2] the value of a firm is equal to the market value of the cash flow generated by the firm's assets. M&M's Proposition I is shown in Equation (1):

$$V_U = V_L \tag{1}$$

Where, V_U is the value of an only-equity firm and V_L is the value of a firm with some degree of leverage. M&M proposition I, also known as the irrelevance principle, indicates that the debt-to-equity ratio does not affect the firm's value and that the primary driver of firm value is the assets (Modigliani & Miller, 1958). According to Modigliani and Miller, the intuition is that if the proposition does not hold, investors could exploit discrepancies in the pricing of identical income streams, which would correct the market, ensuring that the firm's market value is independent of its capital structure. For instance, if an unlevered firm has a higher value than a levered firm, investors could sell shares in the levered firm and use the proceeds and borrowed funds to replicate the cash flows of the levered firm's shares, which in turn would drive up the price of the unlevered firm's shares and push down the levered firm's shares. Hence, when such opportunities exist, investors are assumed to be rational and restore the valuation equilibrium through the above arbitrage (Modigliani & Miller, 1958).

Until now, capital structure has been found to be irrelevant. However, M&M proposition II extends on this by saying that it affects the cost of equity. The intuition is that when leverage increases, the shareholder risk also increases. This relationship is shown in equation (2):

$$r_E = r_0 + \frac{D}{E}(r_0 - R_D) \tag{2}$$

[1] Only M&M proposition I & II will be discussed here due to relevancy.
[2] According to the paper, the assumptions behind perfect capital markets include: 1) No frictions in the market, 2) lending and borrowing at the risk-free rate, 3) no backruptcy costs, 4) perfect informatin, 5) no taxes, 6) income is paid out in dividends, 7) constant company earnings, 8) no transactions costs (Modigliani & Miller, 1963).

Where, r_E is the cost of equity for a levered firm, r_0 is the cost of equity for an unlevered firm, and r_D is the cost of debt. This shows that the cost of equity is equal to the cost of equity for an unlevered firm plus a premium equal to the financial leverage (Modigliani & Miller, 1958).

Throughout time, the M&M propositions have been criticized for assumptions that might seem unrealistic; however, the theory remains one of the most well-known regarding capital structure. Furthermore, it must be noted that when Modigliani & Miller released the revised version, which was published in 1963, it included an extension of the theorem to include the effect of tax shield on debt (Modigliani & Miller, 1963). Due to the influence of Modigliani and Miller (1958, 1963), theories discussed in the subsequent sections are characterized by expanding on some of the foundational knowledge that M&M has laid out. The first branch is the trade-off theory, which focuses on balancing debt and bankruptcy costs, as well as agency costs. The next branch is pecking order theory, which considers the hierarchal structure of a firm's funding decisions.

4.1.2 Trade-off Theory

As mentioned above, the M&M theorem is based on the assumption of perfect capital markets with no taxes or bankruptcy costs. Kraus & Litzenberger (1973) were some of the first to expand on this view, with the introduction of a model that considered corporate taxes and bankruptcy penalties in explaining the effect of leverage on firm value. Trade-off models describe the relationship between the interest tax savings from increased debt and the costs of financial distress that this additional debt imposes on the firm. Models trying to capture trade-off theory can be divided into two district groups: static trade-off models, as developed by Kraus & Litzenberger (1973), and dynamic trade-off models, such as the one developed by Fischer et al. (1989).

Static trade-off models

Static trade-off models are defined by single-period optimization and suggest the existence of an optimal capital structure. Kraus & Litzenberger (1973) introduced the single-period trade-off theory, better known as the static trade-off theory. The assumption here is that the costs of default are known, and the companies will use this information to balance their capital structure. Therefore, companies will try to balance the benefit of the above-mentioned interest tax savings and the increased risk of default from taking more debt. As mentioned earlier, the static

trade-off models are not limited to balancing debt and bankruptcy costs but also agency costs. In section 4.1.2.1, this branch of static trade-off theory will be discussed.

Dynamic trade-off models

The dynamic model instead assumes a multiperiod process, where firms may deviate from this target capital structure. However, the firm will try to adjust toward the target over time. Hence, a crucial part of the dynamic trade-off theory revolves around the speed of adjustment towards the target leverage ratio (Fourati, 2021). The dynamic model introduced by Fischer et al. (1989) for an optimal capital structure lets the company consider the transaction cost in a recapitalization. When considering transaction costs, the company could make a well-reasoned choice of capital structure that shifts over time. There will then be a top and a bottom border for the leverage where recapitalizing is needed when the shifting capital structure hits one of the borders. The reason for recapitalizing is that the benefits of such recapitalizing outweigh the transaction costs. The model assumes that a company with an ideal capital structure delivers a fair risk-adjusted return.

To look at a newer interpretation of a dynamic trade-off model, this section will describe the model by Titman & Tsyplakov (2007). The aforementioned dynamic model considered transaction costs, Titman & Tsyplakov (2007) contends that the pace of recapitalization disregards agency problems between the debt and equity stakeholders and the cost of default. In this model, the potential cost of default is assumed to move the company toward an optimal level of leverage, and agency costs are assumed to discourage the company from moving toward the optimal level of leverage. This model evaluates the advantages and disadvantages of deviating from the optimal level of leverage. Titman & Tsyplakov (2007) suggests that the assumption of agency problems between debt and equity stakeholders, which typically reduce leverage, is less definitive when there is evidence of potential default costs. This means that companies should rapidly strive for the optimal level of leverage if the agency costs are low, and the potential costs of default are high.

4.1.2.1 Agency Theory

Another critical aspect of optimal capital structure relates to agency theory and, more specifically, agency costs. Jensen & Meckling (1976) show that the interests of managers (agents) and shareholders (principals) may not align and how this affects the firm's capital structure. The misalignment of interest leads to agency costs, defined as the sum of monitoring expenditures

by principals, bonding expenditures by agents, and residual losses from suboptimal decisions. Hence, agency theory suggests that capital structure decisions are influenced by the firm's considerations about minimizing agency costs. Overall, the theory points out conflicts of interest between four distinct parties - first, between the shareholders and the managers, and second, between shareholders and debt holders.

Shareholders and managers

Jensen & Meckling (1976) show that when a manager's ownership stake in the firm decreases, their incentive to maximize their utility rather than firm value increases. Because shareholders are the firm's owners, their interest revolves around maximizing the value of their shares, which typically aligns with the firm's value maximization. This means that when the ownership stakes of the manager decrease, the manager might pursue personal benefits at the expense of the shareholders. Hence, costs associated with ensuring managers act in the best interest of shareholders are deemed agency costs. Aligning the incentives of shareholders and managers is done by increasing the managers' ownership stake in the company. Another way to align incentives is by increasing the amount of debt and, in turn, the interest expenses. This removes excess cash that would otherwise have been available at the manager's disposal (Jensen & Meckling, 1976).

Shareholders and debt holders

Increasing the debt levels may lead to another agency conflict between shareholders and debt holders. When the firm incurs debt in its capital structure, it incentivizes the manager to engage in actions that transfer wealth from bondholders to stockholders, i.e., take on riskier projects because the debtholders bear the downside risk. This is due to the hierarchy of financial claims that the two parties hold the firms' assets in case of bankruptcy. Shareholders have the residual claim, which means that debt must be satisfied first. As the amount of debt increases, the probability of bankruptcy also increases, meaning that the optimal capital structure balances the benefits of debt against the incurred agency costs of debt (Jensen & Meckling, 1976).

4.1.3 Pecking Order Theory

When discussing capital structure, it is inevitable not to talk about the pecking order theory, which was first introduced by Donaldson (1961) but popularized and modified by Myers & Majluf (1984). The main point of the theory is that companies prefer internal financing

over external financing. This means that the hierarchical order in which companies prefer financing starts with internal financing, then external debt financing, and lastly, external equity financing. The intuition behind this hierarchy is that internal financing is associated with lower issuer costs or transactions, whereas external financing is associated with higher issue costs (Myers & Majluf, 1984). The assumption is that the managers are rational and strive to maximize existing shareholders' value. Existing shareholders are seen as passive investors, meaning they will not purchase newly issued equity from the company. Issuing equity can dilute the existing shares' value, meaning the company could choose not to issue equity, even though the proceeds from such an equity issue could create new value for the existing shareholders (Myers & Majluf, 1984). In this case, the market believes the company would only issue equity if its shares are overvalued, as they have more information than outsiders. The result is that the market sees an issue of equity as an alarming signal that will affect the share price in a negative way (Myers & Majluf, 1984). This is also one of the arguments for using internal financing since there is no adverse selection, as the company will use retained earnings when in need of financing for new value-creating projects. Adverse selection problems exist with debt and equity, and the company will still prefer debt over equity as debt will not affect the share price as much as equity (Myers & Majluf, 1984). The authors refer to how asymmetric information affects the hierarchy, as the company will always have complete information regarding performance, future possibilities, and risks associated with the company. Therefore, the company must pay a "premium" for asymmetric information to external parties through higher interest rates for external debt or a discount in external equity financing. This then speaks for internal financing, as the amount of asymmetric information can be minimized and, therefore, the cost of financing.

4.1.4 Dynamic Pecking Order Theory

As mentioned above, Myers & Majluf (1984) explains how debt financing should be preferred over equity financing. However, Myers & Majluf (1984) does not factor in the changing dynamics that can influence the funding choice. This caused future iterations to consider the original theory of the pecking order theory a static model.

Leary & Roberts (2010) provided a new interpretation of when and how the static pecking order theory could improve firms' performance. The results concluded that following the static pecking order theory led to relatively poor performance in more than 80% of the firms. This

inspired a model by Morellec & Schürhoff (2011), which added a dynamic component to the theory by assuming companies could choose the timing of their investments. By doing this, they show that corporations can utilize the timing of equity financing to their advantage. This dynamic theory was further developed by Strebulaev et al. (2013), who added the assumption that the firm type is known to the investor. This makes the model more complex but realistic, as the investors can assess the investment risk. By knowing the type of firm, investors understand the existing assets before investing and how these assets create value for the firm. Following this model, the company must try to balance the risk of issuing debt and the cost of equity, as issuing debt will increase the risk of default and, in turn, the loss of the existing assets.

To summarize, this means that companies must assess the investment from the standpoint of minimizing the sum of the additional cost of debt (and, therefore, the risk of default) and the cost of issuing equity. The company will assess the overall business risk for an investment, and if issuing debt significantly heightens the business risk, the company could choose to issue equity instead to lower the default risk. The model, therefore, predicts that proportional safe projects would be financed with debt and proportional risky projects would be financed with equity. This model then violates the assumptions of the static pecking order theory but follows the conclusion that smaller growth companies prefer equity over debt (Strebulaev et al., 2013).

4.2 Firm Performance

Having covered some of the leading pioneers of capital structure theory, the following section provides insight from studies regarding firm performance. With firm performance being the second critical dimension of this thesis's research question, it makes sense to investigate what constitutes firm performance.

Firm performance is a broad term, and several studies have highlighted this. As pointed out by Neely et al. (2005), firm performance is often discussed but rarely defined. When talking about firm performance, one can think about the definition of performance measurement, an even broader term. Performance measurement can be defined as the process of quantifying the efficiency and effectiveness of an action (Neely et al., 2005). Performance measures are needed to quantify the efficiency and effectiveness of an action. Performance measures are metrics used to quantify an action's efficiency and effectiveness (Neely et al., 2005). Hence, one can think

of firm performance measurement as the efficiency and effectiveness of several firm actions. This can pertain to several business areas, but one of the most studied dimensions of firm performance is financial performance, which is also at the core of this thesis. Studies containing an element of firm performance often use several financial performance measures in conjunction with each other, highlighted later in section 4.3, where previous empirical results are covered. However, broadly speaking, financial performance measures can be divided into two groups: Accounting-based measures and market-based measures.

Accounting-based measures

According to Al-Matari et al. (2014), accounting-based measures are generally a good indicator of a firm's profitability. One drawback, however, is that these measures are often criticized for being backward-looking. Most metrics are only partially forward-looking, as they are affected by depreciation and amortization. Furthermore, they are impacted by different accounting practices across firms (Kapopoulos & Lazaretou, 2007). The most frequently used measures vary depending on the type of study. However, looking at the measures used in similar studies, two are mentioned more often than others: ROE and ROA. This is pointed out by Dao & Ta (2020), who found that a combination of ROA and ROE was used in over 73% of studies investigating the relationship between leverage and firm performance. The same tendency has been found across papers studying the relationship between corporate governance and firm performance, where 46% used ROA and 26% used ROE (Al-Matari et al., 2014). Trailing behind ROA and ROE, variables such as return on sales, profit margin, and EPS can be named (Al-Matari et al., 2014).

Market-based measures

Contrary to accounting-based measures, market-based measures are characterized by being forward-looking. Here, the forward-looking aspect of market-based measures is reflected in the shareholders' expectations regarding the firm's future performance (Al-Matari et al., 2014). One metric often comes up when examining market-based measures used in similar studies. This is also reflected in the study by Dao & Ta (2020), who finds that the metric TQ was used in almost 27% of the studies investigating the relationship between leverage and firm performance. The use of TQ is even more pronounced when looking at the use of market-based measures in studies of the relationship between corporate governance and firm performance, where TQ was used in 78% of the studies. Other variables worth mentioning include the market-to-book value of equity, abnormal returns, and dividend yield (Al-Matari et al., 2014).

4.3 Previous Empirical Results

The following section provides a thorough review of the empirical research on the relationship between leverage and firm performance. Throughout recent years, scholars have tried to investigate how leverage affects firm profitability. However, the results of these studies vary, suggesting that no universal answer has been reached yet. Several countries and markets have been investigated, with the vast majority being non-EU countries, particularly developing countries. Furthermore, emphasis has been placed more on larger corporations than on SMEs, contributing to the originality of this thesis. The section will be divided into two parts. The first part covers the studies most relatable to this thesis; the studies investigating the relationship between leverage and firm performance in Sweden. The second part covers studies examining this relationship, but where the country sample is not Sweden.

4.3.1 Previous Empirical Result from Sweden

Yazdanfar & Öhman (2015) did a study on a cross-sectoral sample of 15,897 Swedish SMEs from 2009 to 2012. One remark is that the sample only contained unlisted Swedish SMEs. To avoid inactive firms in the sample, Yazdanfar & Öhman (2015) required the companies to have at least one employee, a total capital above SEK 100,000 (EUR 11,200), and a total revenue above SEK 120,000 (EUR 13,400). The main findings were that accounts payable, short-term debt, and long-term debt negatively affected the performance of Swedish SMEs when measured using ROA. Yazdanfar & Öhman (2015) relates this to the pecking order theory, where the results are not aligned, as they indicate that Swedish SMEs prefer equity capital and retained financing over external funding.

In addition to the relationship between leverage and firm performance, the study also highlights a significant positive relationship between the control variable firm size and firm performance (Yazdanfar & Öhman, 2015). According to the authors, the reason for including firm size is that larger SMEs have better access to economies of scale, diversified product portfolios, and market access, which should impact firm performance positively. Interestingly, the positive relationship between firm performance and firm size varies across industries. When the authors looked at the overall sample, a positive relationship was revealed, but the exact relationship turned negative when looking at the wholesale sector in isolation. Moreover, the second control variable included in the study, firm age, displayed a negative relation to firm performance. However, Yazdanfar & Öhman (2015) provides little interpretation of this result.

A similar study was conducted by Kachlami & Yazdanfar (2016), who also researched Swedish SMEs from 2009 to 2012. Other constraints were, however, used in this study compared to the one by Yazdanfar & Öhman (2015), leading to a final sample consisting of 13,548 SMEs. The dependent variable used in this study was a relative performance measure calculated as sales growth divided by industry growth. As for independent variables, the authors used short-term debt and long-term debt (Kachlami & Yazdanfar, 2016). The findings revealed a significant positive relationship between short-term debt and firm performance but a significant negative relationship between long-term debt and firm performance. Like Yazdanfar & Öhman (2015), the authors find that Swedish SMEs prefer to finance their operations with short-term debt compared to long-term debt. As for control variables, Kachlami & Yazdanfar (2016) also found a positive relationship between firm size and firm performance and a negative relationship between firm age and firm performance. Kachlami & Yazdanfar (2016) highlight several plausible reasons for the relationship between firm age and firm performance. First, firms can get older without growing their sales, markets, products, or financial resources. Second, the positional advantage of being a young, flexible SME might sometimes be better than an older, more rigid SME (Kachlami & Yazdanfar, 2016).

Although the two papers cannot be directly compared due to differences in performance measures, some common ground can be found between them. First, long-term debt is negatively related to firm performance. Second, they both discover that firm size relates positively to firm performance. Third, both studies find a negative relationship between firm size and firm performance when the entire sample is used.

4.3.2 Previous Empirical Results from Other Countries

Having reviewed the research involving Swedish samples, the following section provides a detailed review of the studies conducted with samples from other countries. Starting off, Abor (2005) researched companies listed on the Ghana stock exchange from 1998 to 2002. The firm performance measure used in this study was ROE, while the leverage proxies used were short-term debt, long-term debt, and total debt. The paper concluded that profitable firms depend more on debt as their main financing option, indicated by a positive relationship between short-term debt and ROE. At the same time, it must be noted that a negative relationship

between long-term debt and ROE was found. This suggests that the increased obligations typically associated with long-term debt, in turn, decrease firm performance (Abor, 2005). Lastly, the study found a significant positive relationship between total debt and firm performance. This, however, strongly follows the results of the relationship between short-term debt and ROE due to short-term debt representing 85% of total debt financing in the sample period. The study also investigated the two control variables, firm size, and sales growth. The authors conclude a significant positive relationship between both control variables and ROE.

Gill et al. (2011) used a newer sample period and looked at the American-listed companies on the NYSE from 2005 to 2007. The paper used short-term debt, long-term debt, and total debt as leverage measurements. As for the firm performance measure, the authors used ROE. Gill et al. (2011) concluded a significant positive relationship between short-term debt and firm performance measured by ROE. Furthermore, a significant positive relationship between total debt and ROE was also found. Both these results align with those found by Abor (2005). Finally, a significant positive relationship was revealed between long-term debt and ROE, which contradicts the results found by Abor (2005). One reason is that debt is tax deductible in the US, giving an advantage compared to other markets. They also find that already profitable companies rely more on debt than non-profitable companies. Furthermore, the authors suggest that the positive relationship between long-term debt and firm performance could be due to the economic downturn in The United States in the sample period, which led to lower interest rates on long-term debt (Gill et al., 2011).

Another study explicitly uses ROE as a performance measure (Pandey & Sahu, 2019). It looked at 91 listed Indian manufacturing companies from 2009 to 2016. The authors used total debt to total equity as their leverage proxy, which differs from most other studies. The author of this study found a significant negative relationship between total debt to equity and firm performance. This stands in contrast to the studies covered so far, but this could be due to the difference in leverage proxies used.

So far, the studies have explicitly focused on ROE as the firm performance measure. Several studies have, however, also tried looking solely at ROA. One of these studies was conducted by Papadimitri et al. (2021), who found an overall negative influence of leverage on firm performance. Here, ROA was used as the firm performance measure, while short-term debt, long-

term debt, and total debt were used as leverage proxies. The robustness of the results was confirmed using various debt measures concerning maturity, control variables, alternative specifications, and data samples. An interesting finding by Papadimitri et al. (2021) is that the inverse relationship between leverage and firm performance diminishes as firms mature. This is indicated by the moderated effect of leverage on firm performance when the authors looked at the older firms in the sample.

Another study that found a negative relationship between leverage and firm performance was Goddard et al. (2005), which researched manufacturing and service companies in five European Union countries - Italy, France, Belgium, the UK, and Spain - covering the period from 1993 to 2001. ROA was again used as the performance indicator, and leverage was defined by non-current liabilities plus loans divided by shareholder funds, representing financial gearing. Their findings indicated a negative relation between financial gearing and ROA but a positive relationship between liquidity - calculated as current assets net of stock divided by current liabilities - and ROA. However, the results from this study may be different from those found by Papadimitri et al. (2021) due to differences in leverage proxies.

Asimakopoulos et al. (2009) researched Greek non-financial companies listed on the Athens Exchange from 1995 to 2003. Asimakopoulos et al. (2009) also, only one firm performance measure, ROA, was used, while total debt was used as the leverage proxy. The relationship between these variables turned out to be significantly negative. One of the arguments made for these findings was that Greece joined the European monetary union in this period, which, in some ways, resulted in a crisis for the Greek economic and political system.

As mentioned in section 4.2, financial firm performance measures can be divided into two categories: Accounting- and market-based measures. The studies covered so far have utilized strictly accounting-based measures. A study conducted by Park & Jang (2013) instead used the market-based performance measure, TQ, as the only firm performance measure in the study. The leverage proxy used was total debt, which is comparable to many of the other studies. The author of this study analyzed the relationship with a study of 308 companies over 13 years from 1995 to 2008. This resulted in the final sample having 2829 firm-year observations. The results from Park & Jang (2013) indicated a significant positive relationship between total debt and TQ. This suggests that higher debt levels are perceived as a positive signal to market participants (Park & Jang, 2013).

Some studies focus on only one firm performance measure, such as those mentioned above. However, most studies tend to use a combination of different accounting-based measures or a combination of both accounting- and market-based measures. In many instances, this is done to increase the robustness of the results. One study was conducted by Vătavu (2015), who researched 196 Romanian-listed companies from 2003 to 2010. The study used ROA and ROE as firm performance measures. The leverage proxies used were short-term debt, long-term debt, total debt, and total equity. Contrary to the other research, the study found that short-term and total debt negatively impacted ROA and ROE. As for the relationship between long-term debt and performance measures, conclusive results were not found. However, a positive relationship was found between total equity and performance indicators (Vătavu, 2015).

Another study using a combination of accounting-based performance measures was conducted by Forte & Tavares (2019). The study used ROE and ROA as firm performance measures, while the leverage proxies used were long-term, short-term, and total debt. The study used a large sample of 48,840 manufacturing companies from 9 European countries from 2008 to 2013. The study aimed to study the relationship between leverage and firm performance by focusing on the interactive effect of including several institutional variables. The authors, however, also estimate their model without interactive terms. The overall results from these estimations indicated a significant positive relationship between all leverage proxies and firm performance measures (Forte & Tavares, 2019). Most studies covered so far have found some degree of mixed results. Hence, this study's one-directional relationship between the different leverage proxies and firm performance stands out.

Ebaid (2009) investigated the relationship among listed Egyptian companies from 1997 to 2005. The motivation for this research paper was the need for historical research regarding the implications of different leverage proxies in emerging markets and transition economies such as Egypt. The study used a combination of accounting-based firm performance measures, including ROE, ROA, and GPM. As for the leverage proxies, short-term debt, long-term debt, and total debt were used. The authors found that higher leverage, measured by short-term and total debt, had a significant negative impact on firm performance measured by ROA, which seems consistent with previously mentioned studies. As for the relationships between ROE, Gross Profit Margin, and the leverage proxies, the results were non-significant. This led the author to conclude that leverage, generally, has a weak-to-no impact on firm performance.

However, the insignificance of the relationship between ROE and the leverage proxies stands in contrast to previously mentioned studies. Ebaid (2009) also included firm size as a control variable. However, no significant relationship was found between firm size and firm performance.

Al-Taani (2013) looked at 45 Jordanian manufacturing companies listed in the period from 2005 to 2009. The study used both ROA and profit margin as firm performance measures. As for leverage proxies, short-term debt, long-term debt, and total debt to total equity were used. The results indicated no significant relationship between the leverage proxies and profit margin. The only significant results found were positive relationships between total debt, total equity, and ROA. Therefore, the insignificance of many of the results aligns with most of the findings of Ebaid (2009).

Even though Al-Taani (2013) did not find any significant relationships between leverage and performance, Zeitun & Tian (2007) presents a contrasting view. This study was also done with Jordanian companies, but through the earlier and significantly extended period of 1989 to 2003, and with a sample of 167 companies. Worth noting is that this period was marked by high political instability, with events such as the Gulf Crisis in 1990-1991 and the Jordanian Intifada in 2000, which the authors also try to control for. The authors used ROE, ROA, EBIT/TA, TQ, market value of equity to book value of equity (MBVR), P/E, and market value of equity and book value of liabilities divided by book value of equity (MBVE) as performance measurements. Hence, this is the first paper in this section using a combination of account- and market-based performance measures. As for the leverage proxies, short-term and long-term debt, total debt, and debt to equity were used. The authors quickly discard the relevance of several firm performance measures in the case of Jordanian companies, as non-significant results were found. Hence, the authors conclude that ROA and TQ are the most relevant performance measures in the Jordan case. As for the results, a significant negative relationship between ROA and all leverage measures was found. Interestingly, although short-term debt is found to be negatively related to ROA, the relationship turns positive when measuring performance by TQ (Zeitun & Tian, 2007). The authors relate this to the findings of Myers (1996) who stated that firms with higher short-term debt have higher growth rates and performance. The contradicting results between the two Jordanian studies can be hard to assess but could be due to differences in method, sample, and time.

Le & Phan (2017) researched listed Vietnamese companies in the period from 2007 to 2012. The accounting-based measures used were ROE, ROA, and TQ. Like many other studies, the leverage proxies used were short-term, long-term, and total debt. The authors found that all debt ratios (book and market value) were negatively related to ROE and ROA. The authors give a couple of different explanations for the negative relationships. First, as a developing market, Vietnam may have some unique characteristics compared to other markets. Second, the deposit and lending interest rates in Vietnam increased sharply in the sample period, which could impact the relationship (Le & Phan, 2017).

One of the most recent studies was conducted by Boshnak (2023). The sample for this research consisted of 70 non-financial companies listed on the Saudi-Arabian exchange from 2016 to 2020. Like the above research, Boshnak (2023) used ROA, ROE, and TQ as performance measures. As for the leverage proxies, the study used short-term debt, long-term debt, and debt-to-equity. In general, a significantly negative relationship between long-term debt and firm performance was found. The relationship between short-term debt and firm performance was generally non-significant. Furthermore, Boshnak (2023) found that long-term debt, total debt, and debt to equity had a significant negative relation to TQ, whereas short-term debt has a non-significant relation to TQ.

A sample of listed multinational enterprises in China was used to look at a different market (Wu, 2019). The sample consisted of 217 multinational companies split up into state-owned and non-state-owned from 2009 to 2016. State-owned companies were defined as companies where the state has a controlling interest. The study measured performance by ROA, EBITDA divided by sales, and NPM. The leverage proxies used were short-term debt and long-term debt. Wu (2019) found that there was no significant relationship between long-term debt and firm performance. However, when looking at short-term debt, a significant positive relationship to firm performance was found for the non-state-owned companies. In contrast, a significant negative relationship was found in state-owned companies.

Going back to European studies, Abdullah & Tursoy (2021) researched listed companies in Germany from 1993 to 2016 and how leverage affects the performance of these companies. Abdullah & Tursoy (2021) also found a positive relation between total debt and total assets and the performance indicators ROA and ROE. The author suggests that this could be linked to the tax shield of debt and the lower costs of issuing debt than equity. Furthermore, they argue that

higher leverage may push the managers to focus more on profitable investment opportunities (Abdullah & Tursoy, 2021)

Another study conducted in the US market was made by Simerly & Li (2000), who looked at a sample of 700 large U.S firms from 1989 to 1993. The study used ROA and ROI as performance measures. As for the leverage proxy, they used an alternative specification compared to the studies covered, namely fixed-charge debt and preferred stock. The study's findings indicated that the relationship between leverage and firm performance was negative or positive, depending on the context. They argue that the result depends on the general economic environment in the sample period, which they define as either a stable or a dynamic economic environment. Their findings in a stable financial environment indicated a positive relationship between leverage and firm performance. In contrast, the opposite was confirmed in the case of a dynamic economic environment (Simerly & Li, 2000).

Having covered similar studies when considering the combination of variables, some studies have also investigated the relationship between leverage and firm performance by alternative forms of measurement. One example is Majumdar & Chhibber (1999) who also found a significant negative relation between debt to equity and performance. This study used a sample of 1,043 Indian companies listed on the Bombay Stock Exchange from 1988 to 1994. Performance was measured as return on net worth, which was seen as a better measure of profitability to also examine governance issues. Majumdar & Chhibber (1999) argued that the negative relation between debt and performance could be attributed to the high annual interest of 15-18%, which Indian companies paid during the period.

Similarly, Chakraborty (2010) researched non-financial companies listed on the Indian National Stock Exchange or the Bombay Stock Exchange from 1995 to 2008. This study looked at profitability by two measures. The first measure was the profit ratio before interest, tax, and depreciation. The second measure used was the ratio of cash flows to total assets. Leverage was measured as the ratio of total borrowing to total assets. Their findings align with the earlier research in India, which indicated a negative relationship between leverage and profitability measures.

Margaritis & Psillaki (2010) researched the relationship between company performance and leverage in France from 2002 to 2005. This study applied a slightly different method by constructing a best practice frontier for firm efficiency and measured each firm's efficiency based on its distance from this frontier. With these efficiency measures, they investigated whether more efficient firms tended to have more or less debt in their capital structure. Ultimately, they found that higher leverage positively impacts firm efficiency. They also found that companies in the R&D and computer segment faced higher agency costs, whereas the chemical industry faced lower agency costs. This is similar to the results derived by Berger (2003) and Weill (2008), who also constructed an efficient frontier and found that higher leverage or lower equity capital ratio positively impacts profit efficiency. Although Weill (2008) found significant evidence for a positive relationship between leverage and performance in most countries, they also found a negative relationship in one country and non-significant results in another.

Singh & Faircloth (2005) took a different approach to how leverage affects companies' performance. Their study included all manufacturing companies listed on NYSE, AMEX, and NASDAQ from 1996 through 1999, with total assets of at least USD 500 million and R&D investment expenditure of at least US$0.5 million. Their approach was to relate companies' R&D expenditure to performance; the argument here is that R&D expenditure is a sign of how much a company is investing in long-term investments. The research by Singh & Faircloth (2005) revealed a strong negative relationship between leverage and R&D expenditure. Their findings also indicated that higher leverage leads to lower R&D expenses, causing differences in the future leverage of their sample companies. They also confirmed that the results were robust to changes in the sample period and model specifications. These findings are used as arguments that leverage relates to lower long-term capital investments and that would, in theory, lead to worse future company performance.

An alternative approach to the US market is a study by Chang et al. (2007), which looks at the same markets, NYSE, AMEX, and NASDAQ, but from 1989 to 1999. The sample excluded financial companies and comprised 81 companies and 247 observations. The study employed an alternative methodology to measure the effect of announced secured debt issues on the market. Specifically, it evaluated the correlation between such announcements and abnormal stock returns and any increases in free cash flow during the post-announcement period. The findings indicated a negative relationship between secured debt announcements and abnormal stock returns. Furthermore, no significant relationship was found between secured debt announcements

and the increase in free cash flow. The paper found a relationship between the announcement of secured debt issues and the later announcement of investment opportunities. Based on this, they argue that secured debt issues positively affect high-growth companies (Chang et al., 2007).

After an extensive literature review, a general overview of the studies seems appropriate, and Table 4.2 provides one.

Table 4.2: Overview of Previous Empirical Results

Author	Performance Proxies	Leverage Proxies	Control Variables	Method Used in the Study	Impact on Firm Performance
Majumdar & Chhibber (1999)	Return on net worth	D/E	FS & FA	POLS	Negative
Simerly & Li (2000)	ROA & ROI	D/E	FS & ROIC	POLS	Mixed
Abor (2005)	ROE	STD/TC, LTD/TC & TD/TC	FS & SG	POLS	Mixed
Goddard (2005)	ROA	Gearing	FS, Market share & Liquidity	GMM	Negative
Zeitun & Tian (2007)	ROE, ROA, EBIT/TA, TQ, MBVR, P/E & MBVE	STD/TA, LTD/TA, TD/TA & D/E	Industry (dummy) & Time (dummy)	RE	Mixed
Ebaid (2009)	ROE, ROA & GPM	STD/TA, LTD/TA & TD/TA	FS	POLS	None
Asimakopoulos, Samitas & Papadogonas (2009)	ROA	TD/TA	FS, SG, Investment, Current assets & Time (dummy)	POLS & FE	Negative
Margaritis & Psillaki (2010)	EFF (Efficiency)	TD/TA	FS, EBIT/TA, Tangibility, Intangibility & SG	POLS & RE	Positive
Gill, Bigger & Mathur (2011)	ROE	STD/TA, LTD/TA & TD/TA	FS, SG & Industry (dummy).	POLS	Positive
AL-Taani (2013)	ROA & PM	STD/TA, LTD/TA & TD/TE	None	POLS	None
Park & Jang (2013)	TQ	TD/TA	None	POLS, 2LS & 3LS	Positive
Vätavu (2015)	ROE & ROA	STD/TA, LTD/TA, TD/TA & TE/TA	Tangibility, Tax, Risk, Liquidity & Inflation	POLS, FE & RE	Mixed
Yazdanfar & Öhman (2015)	ROA	AP/TA, STD/TA & LTD/TA	FS, FA, Industry (dummy)	3LS	Negative
Kachlami & Yazdanfar (2016)	SG/Industry growth	STD/TA & LTD/TA	ROA, FS, FA & Industry (dummy)	POLS, FE & RE	Mixed
Le & Phan (2017)	ROE, ROA & TQ	STD/TA, LTD/TA & TD/TA	Growth, Tangibility, Tax rate, Risk, Investment, CF/TA,	POLS, FE, RE & GMM	Negative

			EBIT/Sales, Liquidity, Dividend		
Forte & Tavares (2019)	ROE & ROA	STD/TA, LTD/TA & TD/TA	FS & SG	FE	Mixed
Pandey & Sahu (2019)	ROE	D/E	None	POLS, FE & RE	Negative
Wu (2019)	ROA, EBITDA/Sales & NPM	STD/TA & LTD/TA	FS & FA	FE	Mixed
Abdullah & Tursoy (2021)	ROE, ROA & Stock price	TD/TA	FS, SG & Dividend	GMM	Positive
Papadimitri, Pasiouras & Tasiou (2021)	ROA & Risk-Adjusted ROA	STD/TA, LTD/TA & TD/TA	FS, FA & Tangibility	FE & RE	Negative
Boshnak (2023)	ROE, ROA & TQ	STD/TA, LTD/TA & TD/TA, TD/TE	FS, FA, SG, Tangibility, Liquidity	GMM	Negative

4.4 Hypotheses Development

Overall, the historical empirical results of the relationship between leverage and firm performance are mixed. While some studies found a positive relationship, most found a negative one or mixed results. There could be several explanations, including the fact that the relationship has been studied in many different markets and periods. Some common tendencies can, however, be derived. For instance, in developing markets, overall findings indicate that leverage negatively affects company performance. In fact, in the studies mentioned in the previous section, no study considering a developing market found a conclusive positive relationship between leverage and firm performance. On the other hand, in studies considering developed markets such as France, Germany, the US, and Sweden, several studies found positive and one-directional evidence in the relationship between leverage and firm performance. Furthermore, some clear tendencies can be seen among the variables used in the studies investigating the relationship. First, many studies use one or a combination of the following firm performance measures: ROA, ROE, or TQ. As for the leverage proxy, several of the studies tend to use short-term debt, long-term debt, and total debt.

The following section outlines a series of alternative hypotheses that explore the relationships between various forms of debt, firm performance, and other relevant variables, such as FS and SG. Each hypothesis is formulated based on existing literature and previous empirical findings. A corresponding null hypothesis is implied for each alternative hypothesis, stating that there is no significant relationship between the variables. The variables will be specified further in section 5.2.

Based on the findings in section 4.3, the first hypothesis developed is as follows:

***H1**: There is a significant positive relationship between STD and firm performance.*

This hypothesis is consistent with several studies, both in the case of Sweden and in other countries as well (Abor, 2005; Boshnak, 2023; Ebaid, 2009; Gill et al., 2011; Goddard et al., 2005; Kachlami & Yazdanfar, 2016; Le & Phan, 2017; Papadimitri et al., 2021). Although many of the studies support this hypothesis, the findings made by Vătavu (2015) were contradictory. The conclusions from previous empirical studies, however, still provide an overweight in evidence pointing towards short-term debt being positively related to firm performance. It is essential to mention that as the rest of the hypotheses are laid out, some studies will be contradictory. However, if an overweight of studies support a conclusion, this viewpoint will be favored.

The following hypothesis is based on the relationship between long-term debt and firm performance.

***H2**: There is a significant negative relationship between LTD and firm performance.*

The studies discussed have generally concluded that there is a negative relationship between LTD and firm performance (Abor, 2005; Boshnak, 2023; Ebaid, 2009; Goddard et al., 2005; Papadimitri et al., 2021).

The following hypothesis sheds light on the relationship between total debt and firm performance.

***H3**: There is a significant positive relationship between TD and firm performance.*

This hypothesis is motivated by the findings of several authors (Abdullah & Tursoy, 2021; Abor, 2005; Boshnak, 2023; Ebaid, 2009; Forte & Tavares, 2019; Gill et al., 2011; Goddard et al., 2005; Le & Phan, 2017; Papadimitri et al., 2021).
Additionally, Pandey & Sahu (2019) points to a negative relationship between DEB and performance.

***H4**: There is a significant negative relationship between DEB and performance.*

Having developed several hypotheses regarding broad leverage proxies and overall firm performance, the following hypothesis concerns the market-based measure TQ.

***H5**: There is a significant negative relationship between leverage and TQ.*

This hypothesis is motivated by the findings of Boshnak (2023) and Le & Phan (2017), who found a general negative relationship between different leverage proxies and TQ. Zeitun & Tian (2007), however, found a positive relationship between leverage and TQ.

Several studies also use control variables, considering their potential impact on firm performance. A control variable that recurs in many papers is firm size, which has led to the following hypothesis.

***H6**: There is a significant positive relationship between FS and firm performance.*

***H7**: There is a significant positive relationship between SG and firm performance.*

The positive relationship between firm size and firm performance is indicated by the results of several studies (Abor, 2005; Kachlami & Yazdanfar, 2016; Yazdanfar & Öhman, 2015).

5 Data & Methodology

Having looked at the results of previous empirical studies and developed a series of testable hypotheses, the following section describes the data collection and analysis procedures used in this thesis. This ensures the integrity of the data collection and cleaning processes and the methods used to obtain the results. Thus, giving complete transparency and enabling full replicability of the results. In terms of research methodology, this thesis strictly follows a quantitative approach over a qualitative one. This is in line with previous research such as Detthamrong et al. (2017), who argues that the qualitative approach is better at answering "why" and "how" questions - questions that do not align with the characteristics of the research question laid out in this thesis.

5.1 Sample Selection

The sample used in this thesis consists of panel data of publicly listed Swedish SMEs in the following industries: *Health Care, Information Technology, Industrials, Communication Services, Consumer Discretionary, Materials, Consumer Staples, Energy, and Utilities*. The sample consists of various financial and non-financial variables, which will be specified in section 5.2. The following section covers how the sample has been sourced and sorted based on time, geographical focus, and the required eliminations and modifications.

All the data used in the sample have been obtained through Bloomberg (Bloomberg Terminal). Using Bloomberg, it has been possible to extract historical financial data such as balance sheets, income statements, and financial ratios at different times. Furthermore, Bloomberg was used to extract the market capitalization for the end of every quarter in the sample period, which was used to calculate one of the variables. For those companies that report earnings and have their balance sheet in a different currency than the Swedish Krona (SEK), Bloomberg has automatically converted the currency at the time of the data's reported time.

To ensure that the final dataset includes SMEs, The European Union's official definition of SMEs has been used to define the screening criteria. According to this definition, only the listed companies with fewer than 250 employees and an annual revenue of less than EUR 50 million for the entirety of the sample period have been included (European Commission, 2003). Consequently, for a company to be included, these criteria had to be met for the entirety of the

sample period. The sample consists of quarterly financial data and metrics from the beginning of 2019 (Q1 2019) to the end of 2023 (Q4 2023) and is limited to consolidated statements. Therefore, no duplicate entries are included because parent companies and subsidiaries are considered one. Regarding the sample period, it becomes evident that the period involving COVID-19, and the Ukraine War is included, which could have a noticeable impact on the results.

Following previous empirical studies such as Gornall & Strebulaev (2015) and Abdullah & Tursoy (2021), financial firms have been removed from the dataset by the definition of the GICS sector. This is done to prevent structurally different companies from disrupting the results. Furthermore, as this thesis focuses on leverage, the companies defined as real estate companies by the GICS sector have been removed from the dataset due to these companies' debt-heavy balance sheets. Hence, excluding financial and real estate firms makes the results of this thesis comparable. In total, 55 financial or real estate firms were removed from the sample.

Additionally, in certain instances, Bloomberg had only recorded semiannual data, meaning there were missing data points in the sample. These companies have been eliminated from the sample. Furthermore, all missing data points have been removed from the sample to be consistent with earlier research. To eliminate the effect of extreme outliers, all variables have been winsorized at the 0.5^{th} and 99.5^{th} percentile of their distribution. This aligns with previous studies such as the one conducted by Leary & Roberts (2005). This has resulted in 294 outliers being removed from the data sample. The panel cannot be considered balanced because some observations have been removed due to missing data. To obtain a balanced dataset, a strict criterion of 20 consecutive data points would have to be imposed on all firms in the sample, which would have decreased the sample size substantially. However, this thesis's primary inference method applies immediately to unbalanced panels (Wooldridge, 2020).

5.2 Variable Specification

The process of gathering, cleaning, and structuring data has now been explained. This section will discuss the definition and computation of the main variables. This includes the leverage variables and other factors theoretically expected to influence firm performance. The latter part will be deemed control variables. As for selecting performance indicators, these will also be grounded in theory. Due to limitations, slight differences may occur between the factors

used in academic literature and those used in this thesis. As such, they will be considered proxies. Most of the previous literature in section 4.3 is used as inspiration when choosing the variables for this thesis. This is to say that some relationships highlighted earlier will be brought up again to justify the selected variable.

In Table 5.1, the chosen variables are reported. All variable abbreviations are shown, as well as their respective labels. Furthermore, the calculations used in this thesis are shown for each variable. This also highlights the potential calculation differences between this thesis and other studies. Data for all metrics have been directly sourced from Bloomberg, except DEM and SG, as these variables were not directly available. Instead, these metrics were calculated manually but still based on data sourced from Bloomberg. All the proxies of the dependent and independent variables are provided as ratios. Total assets are measured as the natural log of total assets.

Table 5.1: Variable Specification Overview

Variables	Label	Calculation
Dependent Variables		
ROE	Return on Equity	T12 Net Income Available for Common Shareholders / Average Total Common Equity
ROA	Return on Assets	T12M Net Income / Average Total Assets
TQ	Tobin's Q	(Market Cap + Liabilities + Preferred Equity + Minority Interest) / Total Assets
Independent Variables		
DEM	Debt to Equity Market Ratio	Total Interest-bearing Debt / (Shares Outstanding * Last Closing Price)
DEB	Debt to Equity Book Ratio	Total Interest-bearing Debt / Shareholders' Equity
STD	Short-term Debt	Total Interest-bearing Debt due within a year / Total Assets
LTD	Long-term Debt	Total Interest-bearing Debt that are not due within a year / Total Assets
TD	Total Debt	(STD + LTD) / Total Assets
Control Variables		
TA	Log of Total Assets	ln(Total Assets)
SG	Sales Growth	(Revenue - Revenue (t-1)) * 100 / Revenue (t-1)

5.2.1 Financial Leverage

When discussing how financial leverage is measured, it boils down to the different ways of measuring debt and equity. Looking at the literature, there is no universal way of measuring leverage. This is also pointed out by Welch (2004) who finds that most scholars use financial debt divided by total assets as a proxy for leverage. According to Welch (2004) this approach

is incorrect as it treats non-financial liabilities the same as equity and effectively counts increases in non-financial liabilities as decreases in leverage. These limitations may be why many studies use multiple leverage variables to capture the different nuances. One study is by Titman & Wessels (1988), where leverage is measured in several ways. As for the debt measurement, Titman's study uses the book value of long-term, short-term, and convertible debt. For the equity part of the equation, he uses both book- and market value of equity for six different leverage measurements. The rationale behind using several different debt measures and book- and market values is two-fold. First, by separating the different types of debt, the different nuances of each type of debt can be captured. Secondly, the predicted coefficients when running regressions may differ depending on whether ratios are measured regarding the book- or market value of equity (Titman & Wessels, 1988). Using the market value of equity, or a combination of book and market value, is not unusual, as seen in several studies such as Graham et al. (2015) and Flannery & Rangan (2006). Although previous studies, such as Welch (2004), have argued that market value ratios are more meaningful than book value ratios, a combination of both will be used in this thesis to capture the different nuances. This is also in line with some of the previous studies mentioned earlier. Furthermore, as suggested by Frank & Goyal (2009), using measures of leverage - one market-based and the other accounting-based - is also interesting because the former is forward-looking while the latter is backward-looking.

Regarding debt, this thesis still relies on book values, particularly interesting-bearing debt, like Flannery & Rangan (2006). Therefore, following the approach of using book- and market value ratios, as well as several different alternative measures, the final set of leverage variables consists of Debt-to-Equity Book (DEB), Debt-to-Equity Market (DEM), Short-Term Debt to total assets (STD), Long-Term Debt to total assets (LTD), and Total Debt to total assets (TD).

5.2.2 Control Variables

In addition to leverage as a predictor, several other factors are also known to predict firm performance. Therefore, to compensate for some of the omitted variables, a set of control variables will be included in the models to help account for the performance that cannot be attributed to the impact of the leverage variables. Hence, the following section will shed light on the other important determinants of firm performance.

In previous literature, firm size has been frequently mentioned as an impact on firm performance. This includes (Abdullah & Tursoy, 2021; Fosu et al., 2016; Ibhagui & Olokoyo, 2018) which all include size as a control variable. The results are, however, mixed across these studies. Abdullah & Tursoy (2021) finds that firm size is negatively related to financial performance but positively related to market-based performance, whereas Fosu et al. (2016) finds that firm size significantly negatively affects firm performance. The studies found a positive relationship between firm size and profitability, suggesting that this can be due to several factors. Here Ayaz et al. (2021) argues that larger firms generally are more diversified, which can mitigate risks and the impact of negative events. With a broader asset base, larger firms reduce the likelihood of insolvency. Secondly, larger firms have easier access to external capital and the ability to borrow at a lower interest rate. This directly reduces the interest expenses and potential for profitability (Ayaz et al., 2021). In addition to different results, different proxies for firm size are also used in the literature. Some studies use the natural logarithm of sales (e.g., Frank & Goyal, 2009; Margaritis & Psillaki, 2010; Titman & Wessels, 1988), and some use the natural logarithm of total assets (e.g., Al-Najjar & Taylor, 2008; Frank & Goyal, 2009; Maury, 2006). The natural log is used due to the difference in the size of companies. In this thesis, the latter approach will be used.

Another variable mentioned in previous studies is growth (King & Santor, 2008; Margaritis & Psillaki, 2010; Maury, 2006). The variable growth can be seen as a variable capturing the potential for growth and investment opportunities (Margaritis & Psillaki, 2010). Including growth as a control variable is even more relevant since the SME market, in general, is considered high growth. The studies mentioned show that a positive relationship between growth and firm performance is generally expected; however, Jang & Park (2011) argues that growth-oriented managers tend to focus on growth over profitability. This would lead to an inverse relationship between growth and profitability. The typical proxy used for growth is the growth in sales, which is also the approach to be used in this thesis (King & Santor, 2008; Maury, 2006).

5.2.3 Performance Variables

As for the performance indicators, several variables will be used. Based on previous literature, the tendency is to use accounting measures as a proxy for performance. However, since all companies in this thesis are listed, looking at market-based performance measures makes sense. Concerning the measures that are strictly accounting-based, return on equity

(ROE) and return on assets (ROA) are frequently mentioned (Abdullah & Tursoy, 2021; Abor, 2005; Tong & Green, 2005). Regarding the calculation of ROE and ROA, this thesis will closely follow studies such as Abdullah & Tursoy (2021), where ROE is calculated as net income divided by total equity and ROA is calculated as net income divided by total assets. More specifically, Bloomberg variable information, ROE, is calculated as the trailing 12-month net income available for common shareholders divided by average total equity. ROA is calculated as trailing 12-month net income divided by average total assets. Another frequently mentioned performance variable is Tobin's Q (TQ) (King & Santor, 2008; Park & Jang, 2013; Ronoowah & Seetanah, 2023). This thesis also considers TQ to be an indicator of market-based performance, contrasting the accounting-based view of ROE and ROA. Essentially, a high TQ indicates that the expected market equity of the firm is higher valued than the book value of its assets (Park & Jang, 2013). This thesis calculates TQ as a summation of market cap, liabilities, preferred equity, and minority interest divided by total assets.

5.3 Research Models

The last part of section 4 will describe the thesis's methodological approach. The empirical model used in this thesis will follow the same principles as previous studies that have also studied the relationship between leverage and performance (Abdullah & Tursoy, 2021; Le & Phan, 2017).

5.3.1 Pooled OLS

The most straightforward approach to panel modeling is probably to ignore the panel structure of the data. A way to do this is using Pooled Ordinary Least Squares (POLS), as it instead treats each row of the data as a different unit of observation (Rabe-Hesketh & Skrondal, 2022). The POLS model is specified as,

$$y_{it} = \beta_0 + \beta_1 x_{1it} + \beta_2 x_{2it} + \cdots + \beta_k x_{itk} + \varepsilon_{it} \quad (3)$$

Based on the beforementioned variables, it is then possible to formulate a regression model based on Equation (3),

$$P_{it} = \beta_0 + \beta_1 Lev_{it} + \beta_2 TA_{it} + \beta_3 SG_{it} + \varepsilon_{it} \quad (4)$$

Where, P (ROE, ROA, TQ) is the measure of performance for firm i at time t, B_0 is a constant term, Lev is the measure of leverage (DEM, DEB, STD, LTD, TD) for firm i at time t, TA and SG are control variables for firm i at time t, ε_{it} is the error term.

When conducting panel data analysis, the ideal scenario is that the estimators are unbiased and consistent. What, in turn, works against this scenario is the presence of unobserved heterogeneity not captured by the observed variables in the model (Wooldridge, 2020). Hence, in the above model, any unobserved heterogeneity would be hidden in the error term. As suggested by Le & Phan (2017), it is, however, expected to encounter unobserved effects that affect the model outcome.

However, one drawback of POLS is that for the model to produce consistent estimations, the unobserved time-constant variables are assumed to be uncorrelated with the regressors. This means that POLS ignores time and individual differences. Thus, the results will be biased and inconsistent if the unobserved effects correlate with any of the observed independent variables. In such cases, specific panel data regression models like fixed effects (FE) or random effects (RE) models are preferable, as mentioned by Wooldridge (2020). These models have also been used extensively in similar studies. Dao & Ta (2020) conducted a meta-analysis reviewing 340 studies across 32 journals and 50 papers from 1998 to 2017 and found that almost 41% of the selected papers used POLS. FE was the second most used statistical approach in 30.2% of the papers, followed by RE, which was used in 26.1%. This leads to the discussion of the two individual-effects models.

5.3.2 Fixed Effects Model

The FE model is characterized by allowing cross-sectional units to have different intercept terms, where a_i are the firm-specific intercepts. The FE estimator uses a transformation, also called the within transformation. This transformation removes the effects of unobserved heterogeneity while also removing any time-constant variables. This means that any firm-specific constant variables are removed from the estimation (Wooldridge, 2020). To illustrate this transformation, consider Equation (5),

$$y_{it} = \beta_1 x_{it1} + \beta_2 x_{it2} + \cdots + \beta_k x_{itk} + a_i + u_{it} \quad (5)$$

Where a_i is the firm-specific intercepts and u_{it} is the error term (Wooldridge, 2020). Next, for each i, the equation is averaged over time, giving,

$$\bar{y}_{it} = \beta_1 \bar{x}_{it1} + \beta_2 \bar{x}_{it2} + \cdots + \beta_k \bar{x}_{itk} + a_i + \bar{u}_{it} \quad (6)$$

Subtracting Equation (6) from Equation (5) for each t, then gives,

$$\ddot{y}_{it} = \beta_1 \ddot{x}_{it1} + \beta_2 \ddot{x}_{it2} + \cdots + \beta_k \ddot{x}_{itk} + \ddot{u}_{it} \quad (7)$$

Equation (7) is based on the time-demeaned variables, which can then be estimated by Pooled OLS. Such an estimator is called the fixed effects estimator (Wooldridge, 2020). The FE estimator is efficient when the error term is serially uncorrelated and homoscedastic. Furthermore, the idiosyncratic error should be uncorrelated with each regressor across all periods. Due to the transformation as mentioned above, no assumption is made about the correlation between the unobserved variables and the explanatory variables (Wooldridge, 2020). Since the panel is unbalanced, firms will have a different number of observations, and some will only have one observation. However, firms with only one observation contribute nothing to learning about β_k when estimating FE, and some units will be lost (Wooldridge, 2020). Furthermore, it is essential to assume that the absence of data for specific periods in unbalanced panels using FE is not systematically linked to the idiosyncratic errors (Wooldridge, 2020).

Formulating a regression model based on FE gives,

$$P_{it} = \beta_1 Lev_{it} + \beta_2 TA_{it} + \beta_3 SG_{it} + a_i + u_{it} \quad (8)$$

5.3.3 Random Effects Model

Starting with the following model,

$$y_{it} = \beta_0 + \beta_1 x_{it1} + \beta_2 x_{it2} + \cdots + \beta_k x_{itk} + a_i + u_{it} \quad (9)$$

Notice that compared with Equation (5), the above equation includes an intercept. RE is preferable when the unobserved effect is considered uncorrelated to the explanatory variables in all periods so that,

$$Cov(x_{itj}, a_i) = 0, \quad t = 1,2, \dots, T; j = 1,2, \dots, k. \tag{10}$$

If this is not the case, removing unobserved effects, such as in the FE estimation, would lead to inefficient estimators (Wooldridge, 2020). Hence, the RE assumptions are the same as those of the FE, but with the one caveat being no correlation between the unobserved effect and the explanatory variables in all periods. Because of this assumption, RE allows explanatory variables that are constant over time to be included (Wooldridge, 2020). Although introducing time-constant variables is possible with RE, the decision between FE and RE will not rely on this because time-constant variables are not a part of the set of variables used in this thesis. The assumption of no correlation between a_i and the regressors does, however, still apply. The composite error term can be defined as $v_{it} = a_i + u_{it}$, giving,

$$y_{it} = \beta_0 + \beta_1 x_{it1} + \beta_2 x_{it2} + \cdots + \beta_k x_{itk} + v_{it} \tag{11}$$

Due to a_i being in the composite error term, v_{it} will be serially correlated across time. To solve this problem, the random effects estimator subtracts a fraction of the time average of the variables (Wooldridge, 2020). The transformation can be written as,

$$\lambda = 1 - [\sigma_u^2/(\sigma_u^2 + T\sigma_a^2]^{1/2} \tag{12}$$

Where λ is between zero and one, indicating how large this fraction is. σ_u^2 is the variance of the idiosyncratic error term, and σ_a^2 is the variance of the individual-specific effects (Wooldridge, 2020). Based on this transformation, the transformed equation is,

$$y_{it} = \lambda\bar{y}_{it} = \beta_0(1-\lambda) + \beta_1(x_{it1} - \lambda\bar{x}_{it1}) + \cdots + \beta_k(x_{itk} - \lambda\bar{x}_{itk}) + (v_{it} - \lambda\bar{v}_{it}) \tag{13}$$

Hence, this transformation adjusts each variable by subtracting the mean multiplied by λ, thereby partially controlling for the individual-specific effects (Wooldridge, 2020). Formulating a random effects model gives,

$$y_{it} = \beta_0 + \beta_1 Lev_{it} + \beta_2 TA_{it} + \beta_3 SG_{it} + v_{it} \tag{14}$$

The strict assumptions of no zero correlation between a_i and the regressors can be hard to justify. In most cases, regressors are outcomes of individual firm characteristics captured by a_i, which would violate this assumption (Wooldridge, 2020). Wooldridge (2020), However, it is still argued that it is common for researchers to apply both FE and RE and then do statistical tests to decide the most appropriate model. This will also be the approach of this thesis, with the tests being conducted in section 5.3.1. With these definitions in mind, applying only FE and RE regressions seems preferable. However, Wooldridge (2020) mentions that computing POLS can provide helpful information. In particular, information regarding the nature of biases caused by leaving the unobserved heterogeneity in the error term, in the case of POLS, or partially in the error term, as in the case of the RE regression (Wooldridge, 2020). As seen in previous literature, the approach of combining several methods of estimation is standard practice (Abdullah & Tursoy, 2021; Detthamrong et al., 2017; Le & Phan, 2017). This also leads to the last estimation model, System GMM, which has some valuable properties compared to the previously mentioned methods.

5.3.4 System GMM Model

Even though FE and RE can deal with many of the pitfalls associated with regressions on panel data, Wintoki et al. (2012) argues that bias relating to omitted variable bias (endogeneity) persists. Endogeneity can still arise from measurement inaccuracies, static endogenous variables, and instances of reverse causality Wintoki et al. (2012). To address one of these problems, the reverse causality problem Detthamrong et al. (2017) lags all variables on the right-hand side of the model equations by one period. To clarify here, reverse causality, in this case, refers to the possibility of firm performance affecting leverage - not only the other way around. Another way to deal with the endogeneity issue is by applying the dynamic panel data generalized method of moments (GMM) as suggested by Le & Phan (2017). The dynamic panel data GMM was first explored by Arellano & Bond (1991) and has some favorable advantages compared to other estimation methods.

Several forms of the GMM estimation exist; however, this thesis performs the two-step System GMM of Arellano & Bover (1995) and Blundell & Bond (1995), which is an extension of the difference GMM estimator introduced by Arellano & Bond (1991). This thesis opted for the System GMM estimator, as the difference GMM estimator has a weakness when using an unbalanced panel with many gaps (Roodman, 2009). As this is the case with the panel in this

thesis, this was seen as the more appropriate choice. Furthermore, Roodman (2009) indicates that GMM performs best on panels with small T and large N. In other words, there are few periods and many individuals. Despite GMM becoming increasingly popular, a disadvantage is that the estimation is complicated, and invalid estimates might arise more frequently, as pointed out by Le & Phan (2017) and Roodman (2009). Due to this, it becomes increasingly important to cross-check the result between the different estimation methods used in this thesis. Based on the application of System GMM, the following dynamic model is therefore specified.

$$P_{\text{it}} = \beta_1 P_{it-1} + \beta_2 Lev_{it} + \beta_{3_{it}} TA + \beta_{4_{it}} SG + v_{it} \quad (15)$$

Hence, the model incorporates a lagged version of the firm performance measure to solve the problems of reverse causality and endogeneity (Roodman, 2009). When specifying the GMM model, the lagged version of the dependent variable is treated as endogenous variables, whereas the two control variables are treated as exogenous variables. This distinction is used when specifying the model parameters. It is essential to mention that the System GMM estimates will be reported to validate the baseline results of section 7.1.

5.3.5 Model Tests

When dealing with panel data, studies tend to apply various tests to choose appropriate estimation methods, such as POLS, FE, and RE. For instance, this is seen in the studies by Le and Phan (2017) and Tesema (2024). As mentioned earlier, the most widely used estimation method in similar studies has been POLS, but in many studies, a combination of the different techniques is often used. In many of these studies, statistical tests are applied to understand which model might be best given the set of variables. Hence, the following section will lay out the core idea of the different statistical tests and the results after conducting them.

Le & Phan (2017) conducts an F-test for FE and the Breusch-pagan test for RE. The chosen model is then based on the results of these tests. However, according to Wooldridge (2020), these tests have some limitations, especially when using the Breusch-Pagan to decide between POLS and RE. Here, the Breusch-Pagan is testing for $H: \sigma_a^2 > 0$, indicating no unobserved heterogeneity and suggesting using OLS. This is, however, not as straightforward as it seems, since the presence of a_i indicated by $\sigma_a^2 > 0$, does not relate to whether a_i is correlated with the independent variables. This suggests that using the Breusch-Pagan test to decide between

the POLS and RE might not be the best idea. Despite the limitations of the test, Wooldridge (2020) points out that there are reasons to prefer RE over POLS. The first reason is that RE partly removes a_i from the error term, leading to less inconsistency, and the second is the general higher efficiency of RE compared to POLS. All this considered speaks for using RE over POLS while keeping POLS in the estimation results for robustness checks.

This leads to the next consideration. Namely, to decide between RE and FE. In most studies that have a panel data approach, the Hausman specification test is used to make this decision (Detthamrong et al., 2017; Le & Phan, 2017). The test is based on the assumption that the unobserved heterogeneity is uncorrelated with all independent variables. Hence, rejecting the null hypothesis (at $p < 0.05$) would indicate using FE over RE (Wooldridge, 2020). Table 5.2 presents the Hausman specification test results on 15 models. That is the number of combinations reached when using the three firm performance proxies (ROE, ROA, and TQ) and each of the five leverage proxies (DEM, DEB, STD, LTD, and TD). Furthermore, both control variables (FS and SG) are used in all the models.

Table 5.2: Hausman Specification Test

Variables	**ROE**	**ROA**	**TQ**
DEM	39.363***	38.76***	85.72***
DEB	44.28***	29.75***	71.47***
STD	42.20***	30.87***	72.85***
LTD	36.46***	32.29***	72.45***
TD	36.59***	33.36***	75.24***

**** p<0.01, ** p<0.05, * p<0.1*

After conducting the Hausman test, results show that the null hypothesis is rejected for all 15 models. As mentioned earlier, a rejection of the null hypothesis indicates that FE is a better fit. This means that FE should be more suitable than RE for all 15 models. Considering that FE seems a better fit for estimating the models, the RE estimates are included for robustness checks only - as was the case with POLS.

In addition to the model mentioned above, Le & Phan (2017) also test for groupwise heteroskedasticity using the Wald test. This is done to increase the efficiency of the models. The null hypothesis is that the errors are homoscedastic, and rejecting the null would indicate the presence of heteroskedasticity in the error terms. If heteroskedasticity and autocorrelation are a

problem, robust standard errors will be applied, as suggested by (Wooldridge, 2020). The results from conducting the Wald test are covered in Table 5.3.

Table 5.3: Modified Wald Test for Groupwise Heteroskedasticity

Variables	**ROE**	**ROA**	**TQ**
DEM	6.6e+32***	5.2e+30***	5.9e+06***
DEB	7.2e+32***	6.0e+30***	2.0e+34***
STD	1.1e+33***	5.4e+30***	1.5e+34***
LTD	9.2e+32***	5.8e+30***	1.4e+34***
TD	9.1e+32***	5.9e+30***	1.6e+34***

**** p<0.01, ** p<0.05, * p<0.1*

The low p-values from conducting the Wald test show a rejection of the null hypothesis in all 15 models. This means that the errors exhibit groupwise heteroskedasticity. As mentioned, robust stand errors will be applied, dealing with heteroskedasticity and autocorrelation of the error terms. As suggested by Wooldridge (2020) the general approach to achieving fully robust standard errors and test statistics when dealing with panel data is better known as clustering. As a result, clustering is applied to the POLS, FE, and RE estimations.

To sum up, model robustness checks in this thesis will be applied using several regression methods (Yazdanfar & Öhman, 2015). FE will be used to obtain baseline results, whereas POLS, RE, and System GMM will be used for robustness checks.

6 Descriptive Statistics

The following section introduces the characteristics of the panel sample. This will provide a clear understanding of the composition of the panel sample before proceeding to the more complex statistical analyses. The section will offer summary statistics of the variables, a correlation analysis, and statistics of the cross-sectional and time-series dimensions. To examine the dataset's characteristics, several figures are included to visualize and enhance the explanations. The final dataset of this thesis consists of 247 Swedish SMEs from nine different industries. There were 3,473 firm-year observations over 20 quarters from 2019 to 2023.

6.1 Summary Statistics

The following sections seek to provide a preliminary understanding of the variables described in section 5.2. The section will cover the main descriptive statistics, including mean, standard deviation, and minimum/maximum values. These statistics are reported in Table 6.1, and as shown, several insights can be drawn by examining the descriptive statistics of the selected variables.

Table 6.1: Summary Statistics of Variables

	N	Mean	SD	Min	Max
DEM	3473	0.087	0.199	0	1.914
DEB	3473	0.295	0.862	0	10.755
STD	3473	0.034	0.071	0	0.885
LTD	3473	0.054	0.103	0	0.807
TD	3473	0.088	0.131	0	0.885
ROE	3473	-0.523	0.700	-5.101	0.961
ROA	3473	-0.314	0.382	-3.317	0.731
TQ	3473	3.794	4.092	0.426	45.017
TA	3473	4.391	1.122	1.678	7.412
SG	3473	0.769	3.628	-0.991	68.2

When looking at the statistics of DEM and DEB, it makes sense to compare these. The mean DEM ratio is 0.087, slightly lower than the mean DEB ratio of 0.295. Furthermore, both ratios have a high standard deviation, indicating significant variability among observations. Regarding the minimum and maximum values, the ratio ranges from 0 to 1.914 (DEM) and 10.755 (DEB), where 0 indicates zero leverage, all equity firm. The difference in maximum values between the two measures can be attributed to two main factors. First, since the stock market determines the market value of equity, it reflects the current market perception of the specific

company. On the other hand, investors do not influence the book value of equity in the same way (at least not instantly) because it is based on historical accounting choices. Secondly, since DEM measures total debt in relation to market capitalization, total debt is likely to be small relative to the total market value of equity.

Considerable deviations are, however, not limited to DEB and DEM. Looking at the first performance variable, ROE, the average value is -0.523, suggesting that many of the firms are experiencing losses relative to shareholder equity. Like DEB and DEM, this variable is subject to significant variability when looking at the standard deviation and the range. The same story can be told about the other performance indicators, which share similar characteristics in terms of statistics. Regarding control variables, the FS and SG reveal similar variability. As mentioned earlier, the FS variable has been subject to a log transformation, which is essential to be aware of when interpreting the results.

When looking at the variables representing the more specific debt figures, STD and LTD, it is possible to get an idea of how leveraged listed Swedish SMEs are. First, an interesting observation is that the mean ratio of LTD (0.054) is slightly higher than the mean ratio of STD (0.034). The thing to note about this is that the mean figures are relatively low, which means that the average indebtedness of a firm in the sample is low. This can be compared to similar studies such as Le & Phan (2017), which found a substantially higher mean ratio for Vietnamese firms for both STD (0.4109) and LTD (0.1083). Furthermore, Öhman & Yazdanfar (2017) studied the short- and long-term determinants of unlisted Swedish SMEs and found that the average STD and LTD ratios were approximately 0.25 and 0.09. This also deviates a lot from the sample in this thesis. One reason could be the different dynamics of listed versus unlisted SMEs. Furthermore, the low reliance on debt could be explained by the findings of Gill et al. (2011), indicating that non-profitable companies tend to use less debt.

6.1.1 Correlation Matrix

The following section turns to a correlation analysis, which measures the relationship between the regressors that enter the models. This includes the pairwise correlation between all independent variables and control variables. This is done to detect whether the selected independent variables suffer from multicollinearity problems. The results from this analysis are reported in Table 6.2. Based on insights from Ratner (2009) a correlation coefficient above

0.7 is considered strong, and anything below is deemed acceptable. Hence, this will be used as the baseline when interpreting Table 6.2.

Table 6.2: Matrix of Pairwise Correlation

Variables	(1) DEM	(2) DEB	(3) STD	(4) LTD	(5) TD	(6) TA	(7) SG
(1) DEM	1.000						
(2) DEB	0.453*	1.000					
	(0.000)						
(3) STD	0.421*	0.527*	1.000				
	(0.000)	(0.000)					
(4) LTD	0.559*	0.524*	0.108*	1.000			
	(0.000)	(0.000)	(0.000)				
(5) TD	0.667*	0.696*	0.624*	0.844*	1.000		
	(0.000)	(0.000)	(0.000)	(0.000)			
(6) TA	0.178*	-0.001	-0.005	0.112*	0.085*	1.000	
	(0.000)	(0.954)	(0.753)	(0.000)	(0.000)		
(7) SG	-0.034*	-0.019	-0.034*	0.000	-0.018	-0.024	1.000
	(0.043)	(0.262)	(0.042)	(0.986)	(0.280)	(0.165)	

**** p<0.01, ** p<0.05, * p<0.1*

A notable observation in the matrix is the moderate correlation between DEB and DEM (0.453). This is likely because of the debt component, which is identical for DEB and DEM. Similarly, there is a high correlation between two other leverage variables, LTD and TD (0.844). This also makes sense, as TD sums up STD and LTD. Even though a high correlation between some of these variables exists and exceeds the threshold of 0.7, multicollinearity would only be a problem if these variables entered the regressions simultaneously. The independent variables are, however, proxies for the same variable (i.e., leverage) and will not enter the regression simultaneously. Only the control variables will enter the regressions simultaneously; importantly, no significant correlation is seen among those.

6.1.2 Correlation Between Performance Indicators

Having looked at the pairwise correlation between the independent variables (and control variables), it also makes sense to look at the correlation between the dependent variables. This is, however, not to satisfy any OLS assumptions but rather to shed light on how interchangeable the variables are. A table showing the pairwise correlation between the performance measures, both accounting- and market-based, is shown in Table 6.3. Once again, a threshold of 0.7 is used as a guideline to determine whether the correlation is strong (Ratner, 2009).

Table 6.3: Pairwise Correlation Between Performance Indicators

Variables	(1)	(2)	(3)
(1) ROE	1.000		
(2) ROA	0.845*	1.000	
	(0.000)		
(3) TQ	-0.066*	-0.113*	1.000
	(0.000)	(0.000)	

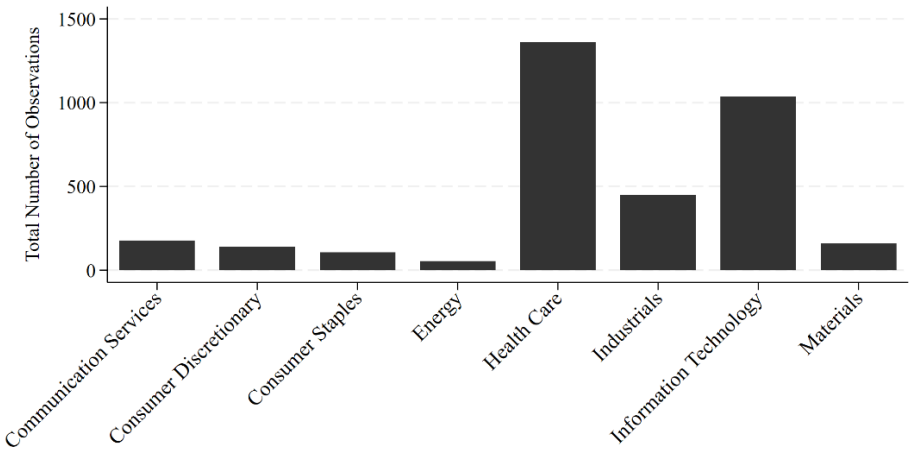
**** p<0.01, ** p<0.05, * p<0.1*

As for the performance variables, a strong correlation is seen between the two accounting-based measures, ROE and ROA (0.845). This makes sense because net income appears in the calculation of both variables. However, the correlation is weak when looking at the correlation between the accounting-based and the market-based measures, TQ. More specifically, there is a correlation between ROE and TQ of -0.066 and a correlation between ROA and TQ of -0.113. Hence, before investigating the regression results, the correlation analysis shows different dynamics depending on whether the performance indicator is accounting- or market-based. Based on the correlation results, it can be concluded that ROE and ROA can be used interchangeably. However, caution must be exercised when treating TQ interchangeably with accounting-based measures because of the low correlation coefficients.

6.2 Exploring the Sample

Figure 6.4 shows the number of observations grouped by the respective industry. The figure reveals some interesting details about the dataset, one of the most obvious being a bias towards *Healthcare* and *Information Technology*. This is, however, explained by the fact that the overwhelming majority of listed SMEs in Sweden are within these industries. This can also be traced back to recent IPOs in Sweden, where the majority of newly listed companies still seem to be either software or pharmaceutical companies, according to (Wass & Ahmad, 2021).

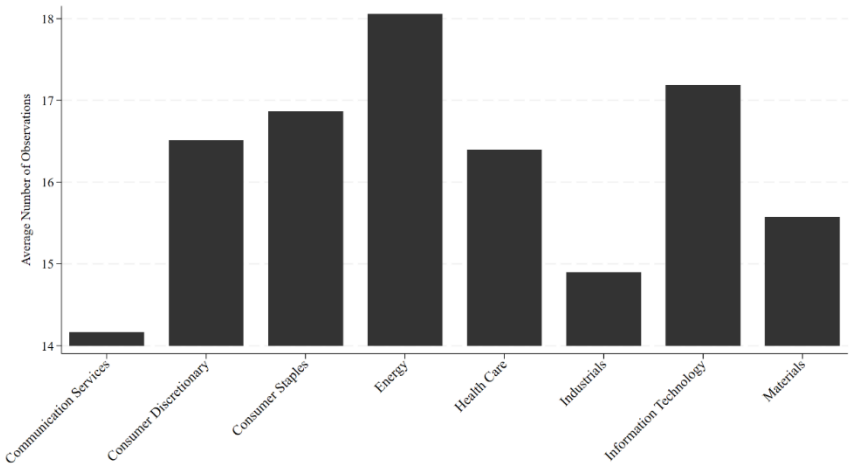
Figure 6.1: Number of Observations Per Industry



Source: Bloomberg (2024) and own contribution

Similar to Figure 6.4, Figure 6.5 also concerns the number of observations on an average entity (firm) level within the respective industries. A complete set of observations with no missing data for any quarters corresponds to 20 observations. Looking at Figure 6.5, the average number of observations varies across industries but is on the high end relative to the maximum number of observations. The lowest number of observations is seen for firms within the Communication Services industry. This could be explained by the smaller sample size of firms in this industry, which would make the impact of firms with a low number of observations higher.

Figure 6.2: Average Number of Observations Per Entity and Industry

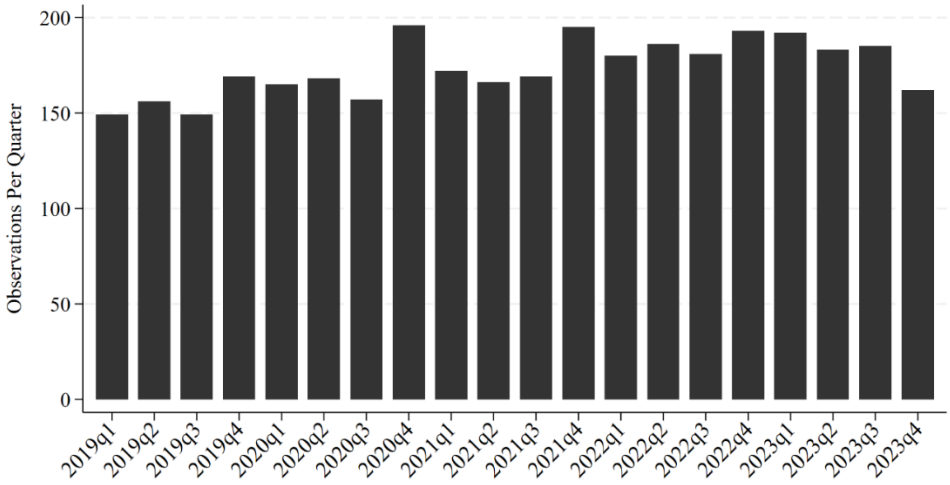


Source: Bloomberg (2024) and own contribution

Having looked at the number of observations for entities and industries irrespective of time, Figure 6.6 sheds light on the number of observations in each quarter from 2019 to 2023. The figure shows that the number of observations generally increases throughout the period. This

is likely explained by the fact that the number of IPOs has increased in the same period. The sudden decrease at the end of 2023 is due to the lack of fillings of the last quarter's financial statement, which was unavailable for all companies when the data was sourced through Bloomberg.

Figure 6.3: Number of Observations Per Quarter

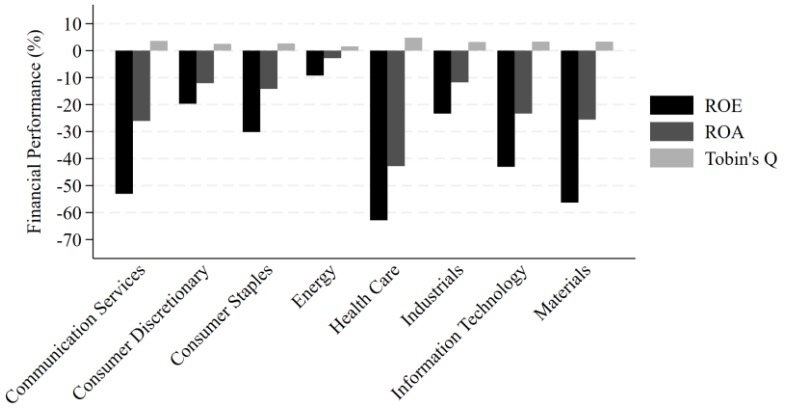


Source: Bloomberg (2024) and own contribution

Having considered the dispersion of the observations across entities and time, the following figures represent visualizations of the variables included in the sample. Figure 6.7 reports the mean values of the financial performance indicators discussed in section 5.2.3. The figure reveals a clear tendency toward non-profitability among Swedish SMEs. Specifically, the sectors of *Health Care*, *Communication Services*, and *Materials* display the lowest financial performance as evidenced by ROE and ROA. Notably, while still showing negative ROE and ROA, the *Energy* industry seems to exhibit less pronounced financial underperformance.

Interestingly, when looking at the market-based performance measure, TQ, *Health Care* displays the highest ratio. This could suggest that the market perceives firms in this industry as having high growth potential. Conversely, the *Energy* industry displays the lowest TQ ratio, which could signal a less optimistic market perception of this industry.

Figure 6.4: Mean of Firm Performance Measures



Source: Bloomberg (2024) and own contribution

Moving on to the leverage proxies, the development over time is depicted in Figure 6.8 (DEB & DEB) and Figure 6.9 (STD, LTD & TD). Figure 6.8 shows the development of DEM and DEB over time. As shown, DEB is much more volatile than DEM, which could be surprising initially. However, since both ratios include TD in the numerator, the instability of the variables comes from the denominator, which in the case of DEM is market capitalization, and in the case of DEB, shareholder's equity. Since market capitalization is more stable in relative terms, the DEM ratio is less volatile, as reflected in the figure. A DEM ratio more significant than one would indicate that the company's total debt exceeds the market capitalization. This has not been the case in any industry, with DEM values staying around 0.2 at the highest. Not many patterns seem to emerge when looking at DEB, however, a slight increase seems apparent at the end of 2023.

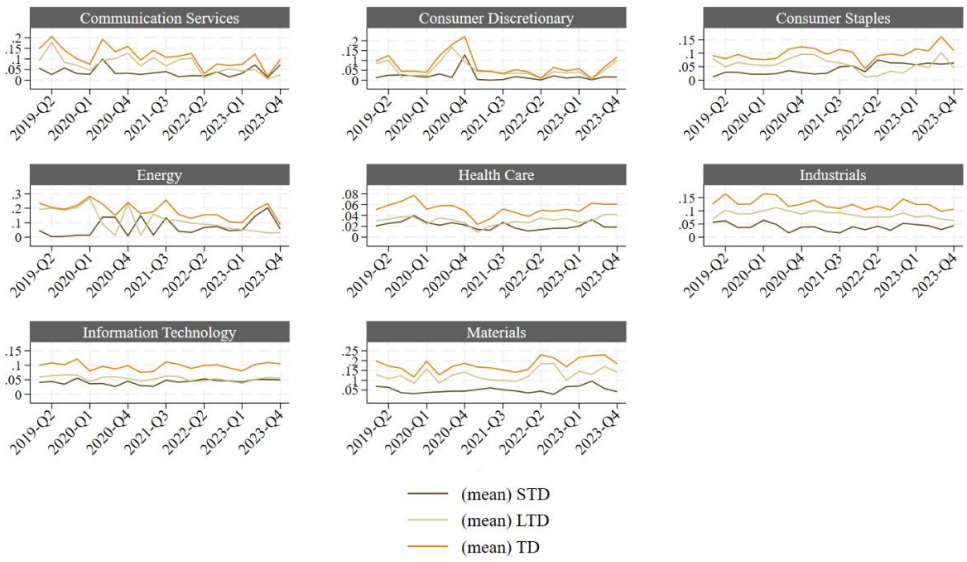
Figure 6.5: Development Over Time (DEM & DEB)

Source: Bloomberg (2024) and own contribution

Figure 6.9 instead looks at STD, LTD, and TD to total assets. As explained in section 6.1, the average LTD ratio was slightly higher than the average STD ratio. Generally, the same is revealed when looking at the average ratios of STD and LTD over time. TD directly measures the amount of assets that are financed by debt and the amount financed by equity. A couple of things can be derived from looking at the figure. First, some trends appear when looking at TD's development across industries. For instance, *Industrials*, *Communications Services*, and *Energy* display decreasing debt ratios to total assets.

In contrast, in recent years, industries such as Consumer Staples and Healthcare have shown increasing debt ratios to total assets. Furthermore, the level of leverage is also different across industries, with some of the highest levels seen in the *Materials* sector and some of the lowest in the *Healthcare* sector. This could be an indicator of differences in access to debt across industries.

Figure 6.6: Development Over Time (STD, LTD & TD)



Source: Bloomberg (2024) and own contribution

7 Empirical Results and Discussions

The following section reports the empirical results and findings concerning the relationship between leverage and firm performance for Swedish SMEs. Furthermore, the impact of selected control variables highlighted in previous literature will also be provided. The results will be discussed and related to previously mentioned empirical research within this field and theory. Section 7.1 shows the baseline results of the thesis. The results from the POLS and RE regressions will instead be presented in sections 7.2.1 and 7.2.2, which turn to the robustness of the results. Lastly, section 7.2.3 will address the potential endogeneity of these types of studies by employing a System GMM model, which will act as a further robustness check. The hypotheses developed in section 4.4 will be either accepted or rejected throughout the section.

7.1 Baseline Results

The baseline results consist of the output from running the FE regressions, as it was established that FE is preferred in all 15 model combinations.

Return on Equity

Table 7.1 presents the findings of the FE estimation with ROE as the dependent variable. Notably, it reveals a significant negative relationship between ROE and DEM, a key independent variable. This finding is consistent with Boshnak (2023), Le & Phan (2017), Pandey & Sahu (2019) and is significant at the 1% level. It underpins the notion that higher debt-to-market cap ratios among listed Swedish SMEs can negatively affect firm performance, as measured by ROE.

Going further and using DEB as the independent variable, a significant negative relationship between DEB and ROE is revealed, consistent with earlier research (Boshnak, 2023; Le & Phan, 2017; Pandey & Sahu, 2019). The result is significant at the 1% level, similar to when the DEM variable was used. This indicates that debt to equity, based on the book value of the listed Swedish SMEs, negatively impacts firm performance as measured by ROE. This finding indicates alignment with H4, stating a negative relationship between DEB and firm performance.

The following sections discuss the results when using either STD, LTD, or TD as the independent variable. Firstly, a significant negative relationship between STD and ROE is revealed. The result found from our research is significant at the 1% level. This result is consistent with several earlier studies (Abor, 2005; Gill et al., 2011; Kachlami & Yazdanfar, 2016; Wu, 2019). However, the direction of the relationship contradicts the results found by Vătavu (2015). Wu (2019) highlights that the inverse relationship between STD and performance is due to the liquidity pressure that increasing STD has.

Furthermore, Le & Phan (2017) points out that short-term debt drives firms to the risks of refinancing. As also pointed out in a previous section, a connection is made between the impact of STD and how well-established the market is. The tendency observed is that in more established countries and markets, STD negatively affects firm performance. Conversely, in less established countries and markets, STD tends to affect firm performance positively. An example of this is a study by Abor (2005), who researched companies on the Ghana stock exchange and found a positive relationship between STD and ROE.

Conversely, Yazdanfar & Öhman (2015), who conducted similar research based on Swedish SMEs, also found that STD has a negative relationship to firm performance. These results indicate that short-term financing of listed Swedish SMEs generally negatively impacts firm performance, as measured by ROE. Finally, this finding cannot confirm *H1*, which states a significant positive relationship between STD and firm performance. This will be tested further in the following two performance variables.

The relationship between LTD and ROE is significantly negative at the 1% level, as shown in the table. The LTD coefficient is higher than the STD, indicating a weaker negative relationship. These results are consistent with some studies as Abor (2005), Boshnak (2023), Le & Phan (2017) but contradict others, such as Gill et al. (2011), which found a significant positive result. Compared with the two Swedish studies mentioned earlier Kachlami & Yazdanfar (2016) and Yazdanfar & Öhman (2015), both studies also agree on a significant negative relationship between LTD and firm performance. Conversely Kachlami & Yazdanfar (2016) found that LTD positively affects firm performance when measured by POLS and RE models. The central hypothesis regarding this relationship, *H2*, similarly stated a negative relationship. Hence, this aligns with *H2* when looking solely at the relationship between LTD and firm performance. As mentioned, this will be further tested with two other performance variables.

The last independent variable, TD, also shows a significant negative relationship to ROE at the 1% level. As STD and LTD had a significant negative relationship to ROE at the 1% level, the same result was expected when using TD as the independent variable. This result is consistent with the earlier empirical results Le and Phan (2017) and Vătavu (2015), where the consensus is that TD and firm performance have an overall negative relationship. Some studies, however, contradict the finding, such as (Abdullah & Tursoy, 2021; Abor, 2005; Forte & Tavares, 2019; Gill et al., 2011). Overall, the results show that total debt financing generally negatively affects the performance of the listed Swedish SMEs during the sample period. Simultaneously, the findings do not confirm *H3*, stating a positive relationship between TD and firm performance. However, this will be further tested as in the two earlier sections.

Regarding the control variables, FS has a significantly positive relationship with ROE at the 1% level. This is the case for all the estimations in Table 7.1, which shows similar results. The results indicate that when the listed Swedish SMEs grow larger, measured on total assets, their performance increases when measured on ROE. This is unsurprising as several earlier studies indicate the same findings, such as Abor (2005) and Yazdanfar & Öhman (2015). A reason for this is also made in section 5.2.2, where it is explained how a larger asset base could give companies access to multiple external financing options and the opportunity to finance investments at a lower interest rate (Ayaz et al., 2021). This is in line with *H6,* which states that there is a positive relationship between FS and firm performance.

The other control variable, SG, has a significant positive relationship to all the estimations. The results are positive and significant at the 5% level. This is consistent with studies by Le and Phan (2017), Margaritis and Psillaki (2010), and Zeitun and Tian (2007), which indicated that firms that experience higher sales growth are more likely to create additional profit and value from investment opportunities. This aligns with *H7*, which states a positive relationship between SG and firm performance.

Overall, the baseline results in Table 7.1 demonstrate a significant negative relationship between various forms of debt (DEM, DEB, STD, LTD, and TD) and ROE for listed Swedish SMEs. These findings indicate that higher debt levels generally lead to lower firm performance. This is not in line with the revised theory M&M Theorem that posits a positive impact of the tax shield on debt on performance, the trade-off theory which suggests that a balance between debt and tax benefits should enhance performance (Kraus & Litzenberger, 1973; Modigliani &

Miller, 1963) The findings could be explained by that increasing debt amounts and refinancing risks heighten bankruptcy costs, potentially incurring legal fees or customer loss (Jensen & Meckling, 1976). The results are consistent with the pecking order theory, which favors external debt financing over external equity financing suggesting Swedish SMEs may prefer debt despite its negative impact on performance due to other underlying preferences or constraints within the market dynamics (Donaldson, 1961; Myers & Majluf, 1984). Myers & Majluf (1984) explains the existence of asymmetric information; therefore, the company must pay a premium for external debt through higher interest rates. The control variables, FS and SG, positively affect ROE, aligning with prior empirical evidence, indicating that FS and SG contribute positively to firm performance.

These results suggest a nuanced understanding of how debt influences firm performance in different contexts and align more closely with the pecking order theory. However, they challenge other prominent capital structure theories.

Table 7.1: Fixed effects with ROE as the dependent variable

Fixed effects	(1) ROE	(2) ROE	(3) ROE	(4) ROE	(5) ROE
DEM	-.383*** (.092)				
DEB		-.163*** (.02)			
STD			-1.038*** (.231)		
LTD				-.832*** (.208)	
TD					-.966*** (.154)
TA	.385*** (.048)	.36*** (.047)	.369*** (.048)	.373*** (.048)	.367*** (.046)
SG	.006** (.002)	.006** (.002)	.006** (.003)	.006** (.002)	.006** (.002)
cons	-2.184*** (.211)	-2.059*** (.205)	-2.112*** (.212)	-2.12*** (.212)	-2.054*** (.204)
N	3473	3473	3473	3473	3473
R-squared	.134	.184	.137	.131	.149
Adj R^2	.133	.183	.136	.131	.149

Robust standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

Return on Assets

Looking at the subsequent regression results in Table 7.2, a negative significant relationship exists between most of the leverage variables and the performance variable ROA. However, the magnitude and significance of the results differ.

Firstly, the findings show a significant negative relationship between DEM and ROA, which was the same when looking at ROE. The result is still significant at the 1% level but with a less negative relation compared to ROE. These findings align with the previous empirical results of Boshnak (2023), Goddard et al. (2005), Le and Phan (2017), Simerly and Li (2000), and Zeitun and Tian (2007), which all found similar findings from their respective data samples. The negative relation between DEM and ROA in Table 7.2 still implies that a higher debt-to-market cap ratio negatively affects the performance of listed Swedish SMEs when measured by ROA.

The FE results also show a significant negative relationship between DEB and ROA at the 1% level. The coefficients are not as negative as when measured on DEM but still negative. Compared to the ROE and DEB results in Table 7.1, the results are still significant on the same level but substantially less negative. These findings align with the empirical results of Boshnak (2023), Goddard et al. (2005), Le and Phan (2017), Simerly and Li (2000), and Zeitun and Tian (2007) but contrast with Al-Taani (2013), which found no significant relationship. Overall, this aligns with H4, stating a negative relationship between DEB and firm performance.

Next is STD and its relationship to ROA. Here, the findings show a non-significant negative result, suggesting no statistically significant relationship between STD and ROA. The result can, however, be compared to earlier findings that found the same results, such as (Al-Taani, 2013; Boshnak, 2023). Similar to this thesis, these studies could not find any significant relationship between STD and ROA either. However, results from less established markets, such as those by Ebaid (2009), Le and Phan (2017), Papadimitri et al. (2021), Vătavu (2015), and Yazdanfar and Öhman (2015), contradict the overall results, as they found positive or negative significant relationships between STD and ROA. This result contrasts with how STD affected ROE in Table 7.1, where the regression found a significant negative result at the 1% level. This finding does not align with *H1*, which stated a significant negative relationship between STD and performance.

The results for LTD and its relationship to the dependent performance variable ROA show a significant negative relationship. However, the result is only significant at the 10% level. Hence, the confidence in this relationship is more limited. The results are not as negative as with ROE in Table 7.1, where the relationship between LTD and ROE was significant at the 1% level. This is also aligned with the historical empirical results such as (Boshnak, 2023; Le & Phan, 2017; Papadimitri et al., 2021; Yazdanfar & Öhman, 2015; Zeitun & Tian, 2007). The results, however, contradict the empirical findings of Al-Taani (2013), Forte and Tavares (2019), and Vătavu (2015), which found no significant or positive relationship between LTD and ROA. The findings indicate that longer-term financing generally negatively affects the performance of the listed Swedish SMEs, as measured by ROA. Boshnak (2023) argues that one explanation for the negative relation between different debt measures (including LTD) is the impact such measures have on the total asset base. High debt levels increase the recurring debt servicing costs, reducing net income and overall profitability. To conclude, this finding is aligned with *H2*, which states a negative relationship between LTD and firm performance.

Lastly, looking at TD and its relationship to ROA, the findings align with what is seen in Table 7.1 and the ROE performance variable. The results indicate a significant negative relationship at the 5% level. This significant result is consistent with earlier empirical results (Asimakopoulos et al., 2009; Boshnak, 2023; Ebaid, 2009; Le & Phan, 2017; Maury, 2006; Papadimitri et al., 2021; Vătavu, 2015; Zeitun & Tian, 2007) but contradicts studies such as those by Al-Taani (2013) and Forte and Tavares (2019), which found a positive relationship between TD and ROA. The result indicates that the performance of listed Swedish SMEs deteriorates as their total debt financing increases. (Le & Phan, 2017) points out a positive relationship between firm performance and leverage is the case with low-growth firms; however, the opposite is true when considering high-growth firms. More specifically, the positive relationship in low-growth firms exists because increasing debt prevents the managers from pursuing unprofitable projects or reducing potential overinvestment problems.

On the other hand, increasing debt in high-growth firms forces managers to forego profitable projects or increase potential overinvestment problems. Since Swedish SMEs are generally considered a high-growth segment, this could explain the negative relationship between leverage (including TD) and firm performance. When considering the proposed hypothesis, *H3*, which stated a positive relationship between TD and firm performance, this finding does not confirm the hypothesis.

For the control variables in Table 7.2, it is first seen that FS has a significant positive effect on ROA at the 1% level. These findings are the same for all estimations in Table 7.2, where very similar results are shown for all independent variables. Compared to Table 7.1, the findings are aligned, as mentioned in the above section. The results indicate that when the listed Swedish SMEs grow larger, as measured by total assets, their performance increases when measured by ROA. This is also the case for most previous empirical research that indicates the same findings, such as (Boshnak, 2023; Papadimitri et al., 2021; Yazdanfar & Öhman, 2015). An explanation for this is also made in section 5.2.2, where it is explained how a larger asset base could give companies access to multiple external financing options and the opportunity to finance investments at a lower interest rate (Ayaz et al., 2021). The main reason is the diversity or size of assets that banks or external lenders can take security in. The positive relationship between FS and ROA speaks for an overall alignment with *H6*. The other control variable, SG, has a significant positive relationship in all the estimations. The results are significantly positive at the 5% level. This, in turn, aligns with H7, which posits a positive relationship between SG and firm performance.

The regression results in Table 7.2 indicate an overall negative significant relationship between the independent debt variables and the dependent performance variable ROA. The significant negative relationships between DEM, DEB, LTD, and TD with ROA suggest that higher leverage reduces the performance of listed Swedish SMEs from 2019 to 2023. These results contradict several theoretical expectations, such as the revised theory of the tax shield benefits, which suggests a positive impact of debt on performance, and the trade-off theory, where a balance between tax benefits and bankruptcy risks should result in positive performance outcomes (Kraus & Litzenberger, 1973; Modigliani & Miller, 1963). The findings also differ from the ideas presented by the agency theory about leverage potentially increasing performance due to management incentives (Jensen & Meckling, 1976). However, the results partly support the pecking order theory, suggesting a debt preference over external equity financing (Donaldson, 1961; Myers & Majluf, 1984).

Table 7.2: Fixed effects with ROA as the dependent variable

Fixed effects	(1) ROA	(2) ROA	(3) ROA	(4) ROA	(5) ROA
DEM	-.125***				
	(.036)				
DEB		-.015***			
		(.006)			
STD			-.116		
			(.088)		
LTD				-.184*	
				(.094)	
TD					-.156**
					(.064)
TA	.201***	.196***	.197***	.197***	.196***
	(.026)	(.026)	(.026)	(.026)	(.026)
SG	.002*	.002**	.002**	.002**	.002**
	(.001)	(.001)	(.001)	(.001)	(.001)
cons	-1.187***	-1.173***	-1.177***	-1.172***	-1.164***
	(.114)	(.116)	(.116)	(.116)	(.116)
N	3473	3473	3473	3473	3473
R-squared	.175	.17	.168	.17	.171
Adj R^2	.174	.169	.168	.169	.171

Robust standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

Tobin's Q

Going through Table 7.3, it is evident that the first debt variable, DEM, has a significant negative relationship with the performance variable, TQ. The findings are significant at the 1% level. The findings align with the results of the FE estimation for the two other dependent performance variables, ROE and ROA. The results in Table 7.1 and Table 7.2 and the relationship between DEM and performance variables were negatively related at the 1% significance level. However, the result shown in Table 7.3 is more negative, which could indicate a larger negative effect compared to ROE and ROA. The earlier empirical study Boshnak (2023) also shows a significant negative relationship between leverage and TQ. Overall, the findings for these variables show that DEM has a negative relationship to the performance of the listed Swedish SMEs measured by TQ. This aligns with *H5*, which stated a negative relationship between leverage and TQ in general.

The following debt variable, DEB, also has a significant negative relation to firm performance when measured by TQ, as shown in Table 7.3. This is consistent with the other results of the FE estimation for ROE and ROA. The results shown in Table 7.1 and Table 7.2 between DEB and the respective performance variable are significantly negative at the 1% significance level. In contrast, with TQ as the dependent variable, the result is significant at the 5% significance

level. This indicates that with the FE estimation, a higher book value debt-to-equity significantly negatively affects the listed Swedish SMEs, measured on ROE, ROA, and TQ. The result is consistent with the findings from previous empirical research Boshnak (2023) which also finds a negative relationship between debt-to-equity and firm performance in other markets, but inconsistent with the findings of Chadha & Sharma (2015) which found no significant relationship. Overall, this result indicates that a higher debt to equity calculated on book value has a significant negative relationship to performance measured on TQ for the listed Swedish SMEs from 2019 to 2023, which also shows an overall alignment with *H5*.

The subsequent result in Table 7.3 shows STD and its relation to the dependent performance variable TQ. The findings show a significant negative relation at the 1% significance level, consistent with the general findings from the FE estimations in Table 7.1 and Table 7.2. In Table 7.1, it was found that STD had a significant negative relationship with ROE at the 1% significance level. However, in Table 7.2, the relationship between STD and ROE is negative but not significant. Therefore, the overall results suggest that STD tends to have a negative impact on the performance of listed Swedish SMEs, although the significance of this relationship varies between different estimations. The findings could indicate the higher risk managers take because of higher debt, which could increase bad investments. The results shown in Table 7.3 for STD are the most negative results between a debt variable and a performance variable using FE. Overall, the result shows that short-term debt financing significantly negatively affects the performance of the listed Swedish SMEs when by STD and TQ. Hence, this relationship also aligns with *H5*.

There is a non-significant positive relationship for LTD, which is inconsistent with the general findings from earlier empirical research. The consensus from earlier empirical research indicates a significant negative relation between LTD and TQ and general firm performance. The same can be said with the dependent variable, TD, which displays a non-significant negative relationship with TQ. This result is also inconsistent with the earlier empirical results, which indicate a significant positive relation between TD firm performance (Boshnak, 2023; Park & Jang, 2013) or findings such as those of Kapopoulos and Lazaretou (2007), King and Santor (2008), and Maury (2006), which posit a negative relationship. Contrary to the previous relationships between leverage proxies and TQ, the inconsistent coefficients found for LTD and TD do not confirm *H5*. However, the majority of results point toward a significant negative relationship, which shows alignment with *H5*.

Going through the control variable FS and its relation to the leverage variables, it becomes apparent that there is a pattern of significant negative results at the 1% significance level. This result is interesting compared to the results found for ROE and ROA in Table 7.1 and Table 7.2, where the overall sentiment is a significant positive relationship. In Table 7.1 and Table 7.2, the relationship between ROE, ROA, and all the dependent debt variables are significantly positive at the 1% significance level. The negative and significant negative coefficient of FS in the models suggests that larger SMEs (measured by TA) tend to have lower TQ. This indicates that as Swedish SMEs grow, the market may value them less. This is inconsistent with the consensus of the earlier empirical research, where FS has a positive effect on firm performance (Boshnak, 2023). The other control variable, SG, shows a non-significant negative relationship for all dependent debt variables, which is inconsistent with the other FE estimations for ROE and ROA in Tables 7.1 and 7.2. Overall, for the FE estimation method and the relationship between debt and TQ, there is a significant negative relationship between DEM, DEB, and STD and the performance of the listed Swedish SMEs when measured by TQ. The findings between the control variables and TQ do not confirm *H6* and *H7*. However, the overall results from Tables 7.1, 7.2, and 7.3 still indicate an alignment with *H6* and *H7*.

The regression results in Table 7.3 display an overall significant negative relationship between the independent debt variables and the dependent performance variable TQ for listed Swedish SMEs. The significant negative relationships between DEM, DEB, and STD with TQ indicate that higher leverage impacts firm performance, consistent with the findings for ROE and ROA in Tables 7.1 and 7.2. These results challenge several theoretical expectations, such as the revised theory of tax shield benefits, which suggests a positive impact of debt on performance, and the trade-off theory, which posits that a balance between tax benefits and bankruptcy risks should result in positive performance outcomes (Kraus & Litzenberger, 1973; Modigliani & Miller, 1963). The agency theory also provides contrasting insights about leverage potentially increasing performance (Jensen & Meckling, 1976). However, the results align somewhat with the pecking order theory (Donaldson, 1961; Myers & Majluf, 1984). The control variables FS and SG show inconsistent relationships with TQ; FS is significantly negatively related, whereas SG is non-significant. Despite some non-significant findings for LTD and TD, most results support hypothesis *H5*, indicating a significant negative relationship between leverage measures and TQ. The general results across Tables 7.1, 7.2, and 7.3 align with hypotheses *H6* and *H7* regarding FS and SG.

Table 7.3: Fixed effects with TQ as the dependent variable

Fixed effects	(1) TQ	(2) TQ	(3) TQ	(4) TQ	(5) TQ
DEM	-1.395*** (.364)				
DEB		-.09** (.04)			
STD			-2.135*** (.645)		
LTD				.697 (.945)	
TD					-.722 (.675)
TA	-2.215*** (.299)	-2.26*** (.297)	-2.264*** (.296)	-2.25*** (.296)	-2.257*** (.296)
SG	-.005 (.013)	-.003 (.013)	-.003 (.013)	-.002 (.013)	-.003 (.013)
cons	13.643*** (1.313)	13.745*** (1.308)	13.81*** (1.303)	13.637*** (1.295)	13.772*** (1.303)
N	3473	3473	3473	3473	3473
R-squared	.115	.11	.112	.11	.11
Adj R^2	.114	.11	.111	.109	.11

Robust standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

To conclude, the results of the FE estimation show a statistically significant negative relation between the various debt and performance variables. The relation between DEM and ROE, ROA, and TQ has been significantly negative at the 1% significance level. This could mean that the higher the debt to market cap, the worse firm performance is seen for the listed Swedish SMEs when measured on ROE, ROA, and TQ. This makes sense when talking about the general equity market in Sweden, as mentioned in Section 3. Swedish companies generally rely on the equity market for financing, which means there needs to be market value for the company to extract money from the stock market. If this is not the case, then the refinancing risk of the debt will increase, and therefore, bankruptcy risk increases (Fourati, 2021; Jensen & Meckling, 1976).

The same result is seen across the board for the DEB variable, where the relationship to ROE, ROA, and TQ are all significantly negative. ROE and ROA are significant at the 1% significance level, whereas TQ is negative at the 5% significance level. This is consistent with *H4*, stating a significant negative relationship between DEB and firm performance. The interpretation could still be that the higher the debt to shareholders' equity of the listed Swedish SMEs, the worse their performance is when measured on ROE, ROA, and TQ. This could be related to the proportion of debt relative to the cash shareholders would receive if the company's assets

were liquidated. This higher debt level increases risk, which could limit performance. This is also how the pecking order theory explains one of the reasons to use internal financing before any external financing (Donaldson, 1961; Myers & Majluf, 1984).

More mixed results are seen for STD, but the general result indicates a significant negative relation to the performance of the listed Swedish SMEs. The relation was clear for the ROE and TQ performance variable, with a significant negative relation to STD at the 1% significance level, whereas the result for ROA was non-significant. Based on these findings, *H1* is not confirmed, which states a positive relationship between STD and firm performance.

The results for LTD were not as clear, as the only relevant significant relation was negative to ROE at the 1% significance level. The results from ROA were negatively significant at the 10% significance level, and for TQ, the result was non-significant. Therefore, the only result relevant for the FE estimation of LTD is ROE, which could indicate that LTD performed poorly on the listed Swedish SMEs from 2019 to 2023 when measured on ROE. The findings indicate an overall alignment with *H2*, which states a negative relationship between LTD and firm performance.

The findings were more aligned for the last dependent variable, TD, as there was a negative significant relation to ROE and ROA, whereas it was non-significant for TQ. With these results, it can be more confidently determined that there is an overall negative relationship between the total amount of debt financing and the performance of the listed Swedish SMEs. The findings did not confirm *H3,* which stated a positive relationship between TD and firm performance. Furthermore, the findings indicate an overall alignment with *H5,* which states a negative relationship between leverage and TQ.

As for the control variables, FS and SG had a significant positive relationship with ROE and ROA performance. Using the TQ dependent variable, FS had a significant negative relation to all the debt variables at the 1% significant level, whereas the results of SG were non-significant. This shows mixed results but tilts toward the conclusions of earlier empirical research, indicating an overall positive relationship to firm performance. At the same time, these results align with *H6* and *H7*, stating a positive relationship between FS, SG, and firm performance.

7.2 Robustness Checks

Robustness checks are essential to increase the validity of the results outlined in the previous section. To check the robustness of the baseline results from section 7.1, where the FE estimation method is used, this section will examine the results from the POLS and RE estimation methods. This study aims to compare the findings of the POLS and RE estimations with the earlier FE estimation and check the robustness of the FE results. Furthermore, to address the issue of endogeneity and as a last form of robustness check, System GMM is used.

7.2.1 Pooled OLS Results

Table 7.4 reveals the results of estimating POLS with ROE as the dependent variable. For column 1, DEM is the leverage proxy, and the coefficient displays a significant negative relationship to the performance variable at the 1% significance level. This direction of influence is consistent with the results found for the FE estimation in Table 7.1, which is of the same significance level. There is a minor discrepancy between the two findings from the different estimation methods; however, the overall similarity in the findings gives the thesis confidence in the results of the FE estimation.

When DEB is used as the leverage proxy, a significant negative relationship is revealed with the performance variable ROE at the 1% level. The results found for the relationship between DEB and ROE in the POLS estimation are aligned with the results of the FE estimation. Both estimation methods found a significant negative relationship at the 1% significance level, but there is a considerable difference between how negative the coefficients are. However, the negative nature and significance of the results also give the thesis confidence in the findings from the FE estimation in Table 7.1.

Next, using STD as the leverage proxy reveals a significant negative relationship to the performance variable ROE at the 1% significance level. Compared to the findings of the FE estimation, consistency is found. Both findings are negatively significant at the 1% significance level, but there is a considerable difference in the negative level. However, the overall comparability of the direction of influence and the significance of the coefficients gives confidence to the results found in the FE estimation.

Using LTD, a significant negative relationship with ROE at the 1% level is found. This direction of influence is similar to when DEM and DEB were used as leverage proxies. The results align with those found for the same debt and performance variables in the FE estimation presented in Table 7.1, which were also significant at the 1% level. However, there is a slight discrepancy between the two findings from the different estimation methods when looking at the coefficients. The overall alignment, however, still provides increased validity of the results in the FE estimation.

Finally, a significant negative relationship is found between the debt variable TD and ROE at the 1% significance level. This is consistent with the results found in the FE estimation of the relationship between TD and ROE, which was also significant at the 1% level. Although there is a minor difference between the two findings from the FE and POLS estimation methods, the overall similarity in the findings also gives the thesis confidence in the results of the FE estimation.

As for the control variables, FS has a significant positive effect on ROE when looking at all the estimations in Table 7.4. The relationship between the control variable FS and the performance variable ROE for the POLS estimation method is consistent with the findings of the FE estimation method. Again, a slight difference in the coefficients is seen between the results of the two estimation methods. However, the direction of influence is still the same, which further adds to the robustness of the results for the FE estimation in Table 7.1.

In terms of the relationship between SG and ROE, it is not as pronounced as with the other variables. In only two of the five estimations, SG is a significant predictor of ROE, and only at the 10% significance level. More specifically, in the estimations, including DEB and STD, a significant negative relationship between SG and ROE is found. The results are mixed compared to those found in the FE estimation, particularly when looking at the significance level of the different estimations. Hence, these results still contribute to the confidence of the results in FE estimation but with a degree of caution.

To summarize the above section, the general alignment between FE and POLS estimation methods for the performance variable ROE enhances the robustness of the FE findings for ROE. This alignment in results was observed for all the debt variables and the control variable TA, which is considered a positive indication for the results of FE estimations.

Table 7.4: Pooled OLS with ROE as the dependent variable

Pooled OLS	(1) ROE	(2) ROE	(3) ROE	(4) ROE	(5) ROE
DEM	-.393***				
	(.057)				
DEB		-.245***			
		(.012)			
STD			-1.638***		
			(.156)		
LTD				-1.025***	
				(.108)	
TD					-1.109***
					(.083)
TA	.225***	.212***	.212***	.223***	.224***
	(.01)	(.009)	(.01)	(.01)	(.01)
SG	-.005	-.005*	-.005*	-.004	-.005
	(.003)	(.003)	(.003)	(.003)	(.003)
cons	-1.473***	-1.379***	-1.395***	-1.445***	-1.404***
	(.045)	(.043)	(.045)	(.045)	(.044)
N	3473	3473	3473	3473	3473
R-squared	.129	.209	.145	.14	.16
Adj R^2	.129	.208	.144	.139	.159

Standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

Table 7.5 shows the relationship with ROA as the dependent variable. Compared to the POLS regression with ROE as the dependent variable, the estimations in Table 7.5 reveal mixed results. When using DEM as the leverage proxy, a significant positive relationship with ROA at the 5% significance level is shown, contrasting the result in Table 7.2 in the FE estimation. The FE estimation found a negative significant relationship at the 1% significance level, which is a considerable difference. Therefore, the results do not increase the thesis's confidence in the FE estimation results.

Like the result in Table 7.2, a significant negative relationship is found between DEB and ROA; however, for the POLS estimation method, it is only at the 10% significance level. Compared to the findings from the FE estimation, the results from the POLS estimation are also negative but only significant at the 10% significance level. In contrast, the FE estimation results are significant at the 1% significance level. This alignment in the negative nature of the results supports the confidence in the thesis' findings from the FE estimation, although with more caution due to the lower significance level in the POLS estimation.

A positive relationship is found for the rest of the leverage proxies; however, none of these results are significant. Therefore, these findings also do not contribute to the confidence of the FE estimation results.

As for the control variables, FS shows a significant positive relationship across all estimations, consistent with the result found through the FE estimation. The results shown for the POLS estimation in Table 7.5 are significant at the 1% significance level, which is also consistent with the findings from the FE estimation. There is an inconsiderable discrepancy between the two estimation methods, but the overall alignment of the methods also gives the thesis confidence in the results.

The control variable SG displays a significant negative relationship across all estimations at the 1% significance level for the POLS. This result does not align with the relationship found for the same variable in the FE estimation, where the results were significantly positive. Therefore, these findings from the control variable SG for the POLS estimation do not add confidence to the results for the FE estimation.

Table 7.5: Pooled OLS with ROA as the dependent variable

Pooled OLS	(1) ROA	(2) ROA	(3) ROA	(4) ROA	(5) ROA
DEM	.064**				
	(.031)				
DEB		-.012*			
		(.007)			
STD			.032		
			(.085)		
LTD				.043	
				(.059)	
TD					.036
					(.046)
TA	.125***	.127***	.127***	.126***	.126***
	(.005)	(.005)	(.005)	(.005)	(.005)
SG	-.004**	-.004**	-.004**	-.004**	-.004**
	(.002)	(.002)	(.002)	(.002)	(.002)
cons	-.864***	-.864***	-.869***	-.868***	-.869***
	(.024)	(.024)	(.025)	(.024)	(.024)
N	3473	3473	3473	3473	3473
R-squared	.142	.142	.141	.141	.141
Adj R^2	.141	.141	.14	.14	.14

Standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

The overall findings from the POLS estimation method and the relationship between the debt and performance variables do not show many significant results. The relationship between DEM and ROA was significant, adding confidence to the thesis' FE estimation.

Table 7.6 concerns the POLS results when using the market-based performance measure, TQ. A significant negative relationship is found between the DEM variable and TQ. The result is

significantly negative at the 1% level, consistent with the FE estimation method. There is a considerable discrepancy between the two estimation methods. Still, since the results are significant and negative at the same significance level, the POLS results add confidence to the FE estimation results.

Significant negative results were also found regarding the DEB variable and its relationship to TQ. The findings are aligned with the findings from the FE estimation at the 1% significance level, but there is a difference in the coefficients. Because of the similar direction of influence and significance level, this result further adds to the robustness of the FE result.

For the debt variable STD, a significant negative relationship to TQ is shown. Again, the results are significant at the 1% level and aligned with the FE estimation regarding the direction of influence. The coefficients are still different, but the findings are negative and at the same significance level, contributing to the confidence of the FE estimation.
The FE estimations showed that the relationship between the debt variables LTD and TD and the performance variable TQ is non-significant. Therefore, the significant results found in the POLS estimations for these variables do not enhance confidence in the FE estimation results.
Contrary to the previous POLS results, a significant negative relationship is found between FS and TQ for all the debt variables. This is in line with the baseline results of the FE estimation, which also found a significant negative relationship between FS and TQ at the 1% significance level for all the debt variables. There is a difference in the coefficients between the two estimations; however, the significance level and general negative direction give the thesis confidence in the baseline results for the FE estimation. No significant relationship was found between the control variable SG and TQ. These findings do not, therefore, contribute to the confidence of the baseline results regarding this relationship.

Table 7.6: Pooled OLS with TQ as the dependent variable

Pooled OLS	(1) TQ	(2) TQ	(3) TQ	(4) TQ	(5) TQ
DEM	-4.267***				
	(.339)				
DEB		-.358***			
		(.079)			
STD			-5.4***		
			(.958)		
LTD				-3.135***	
				(.662)	
TD					-3.508***
					(.517)
TA	-.608***	-.743***	-.745***	-.711***	-.708***
	(.06)	(.06)	(.06)	(.061)	(.06)
SG	-.021	-.016	-.018	-.014	-.016
	(.018)	(.019)	(.019)	(.019)	(.019)
cons	6.854***	7.176***	7.262***	7.095***	7.225***
	(.27)	(.276)	(.276)	(.275)	(.275)
N	3473	3473	3473	3473	3473
R-squared	.083	.047	.05	.048	.054
Adj R^2	.083	.046	.049	.047	.053

Standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

The results of the POLS estimation of TQ and the relationship to the debt variables could, to some extent, add confidence to the baseline results of the FE estimation. Differences were found, but the overall alignment of several variables contributes to the confidence of the FE estimation of TQ. The POLS estimations shown in Tables 7.4, 7.5, and 7.6 align with the baseline findings for the FE estimation. Therefore, the POLS findings further emphasize the FE results for all performance variables ROE, ROA, and TQ.

7.2.2 Random Effects Results

Next, for the robustness check, the following section will examine the RE estimation results for the three dependent performance variables of ROE, ROA, and TQ. Firstly, the result of using ROE as the dependent variable will be compared. When looking at the DEM debt variable, it becomes evident that there is a significant negative relationship to ROE at the 1% significance level. This result is consistent with the FE results in Table 7.1, which are also significantly negative at the 1% significance level and only slightly differ from the results of Table 7.1. The result gives confidence in the preferred estimation method of FE for the relationship between DEM and ROE.

The results indicate a significant negative result for the dependent variable, DEB, and its relation to ROE. The findings are significant at the 1% significance level, consistent with the findings from Table 7.1, with only a minor discrepancy between the results for the FE estimation method. This furthers our confidence in the results of the relationship between DEB and ROE.

STD also shows a significant negative relationship to the performance variable of ROE at the 1% significance level. This finding is consistent with the findings of the FE estimation in Table 7.1 for the relationship between STD and ROE. A slight difference exists between FE and RE, but the overall alignment gives confidence in the results.

LTD shows consistency with the earlier results. The findings indicate a significant negative result at the 1% significance level, which aligns with the finding of the FE estimation in Table 7.1. As with the earlier results of this section, there is a slight, inconsequential difference between the results of the estimation methods FE and RE for the relationship between LTD and ROE. However, the overall alignment found gives confidence in the results for the FE estimation.

The findings for the last dependent debt variable, TD, are similar to the earlier findings in this section. The result shows a significant negative relationship between TD and ROE at the 1% significance level. The findings shown in Table 7.7 are consistent with those found in the FE estimation from Table 7.1. A minor inconsistency exists between the estimation methods FE and RE results for the relationship between TD and ROE. However, this does not change the fact that the result from this estimation method gives confidence for the validity.

When interpreting the results of the control variables in Table 7.7, the findings from Table 7.1 are consistent. Both FS and SG display a significant positive relationship with ROE. The result for FS is significant at the 1% significance level, similar to the FE estimation method. SG is significant at the 5% significance level, consistent with the FE estimation. The findings have a minor discrepancy compared to the FE estimation method. However, the results for the RE estimation of control variables are deemed to give confidence in the findings from the FE estimation method, as shown in Table 7.1.

Table 7.7: Random effects with ROE as the dependent variable

Random effects	(1) ROE	(2) ROE	(3) ROE	(4) ROE	(5) ROE
DEM	-.379***				
	(.081)				
DEB		-.17***			
		(.019)			
STD			-1.07***		
			(.229)		
LTD				-.891***	
				(.192)	
TD					-.99***
					(.144)
TA	.338***	.315***	.322***	.328***	.324***
	(.036)	(.035)	(.036)	(.036)	(.035)
SG	.005**	.005**	.006**	.006**	.006**
	(.002)	(.002)	(.002)	(.002)	(.002)
cons	-2.009***	-1.885***	-1.937***	-1.95***	-1.89***
	(.173)	(.167)	(.172)	(.172)	(.167)
N	3473	3473	3473	3473	3473
Adj R^2	.133	.182	.136	.130	.148

Robust standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

The general results from Table 7.7 show a high level of similarity with the results from the FE estimation method for the performance variable of ROE. Overall compatibility was found for all the debt and control variables, which should increase the confidence and robustness of the FE estimation results with ROE as the dependent variable.

The subsequent RE estimation in Table 7.8 shows a negative relationship between DEM and ROA, which is significant at the 1% level, consistent with the FE results in Table 7.2. The results of the estimation methods FE and RE for the relationship between DEM and ROA differ slightly. However, the overall alignment gives the thesis confidence in the results of the FE estimation.

The following result from the RE estimation regarding DEB shows a significant negative relationship between DEB and ROA at the 1% significance level. This is fully aligned with the results found for the FE estimation in Table 7.2, where no differentiation is found between the results of the estimation methods FE and RE for the relationship between DEB and ROA. Therefore, the results contribute to the confidence of the FE estimation of the relationship between DEB and ROA.

For the independent debt variable STD and its relationship to ROA, the RE estimation found a non-significant result consistent with the relationship shown in the FE estimation in Table 7.2. This gives further confidence in the non-significant relationship between STD and ROA.

The following independent debt variable is LTD. In looking at the relationship to ROA, the RE estimation found a significant negative result at the 10% significance level, consistent with the relationship shown in the FE estimation in Table 7.2. There is a slight, inconsequential differentiation between the results of the estimation methods FE and RE for the relationship between LTD and ROA. However, the overall regularity gives confidence in the results for the FE estimation.

For the last independent debt variable, TD, and its relationship to ROA, the RE estimation found a negative significant result at the 5% significance level, consistent with the relationship shown in the FE estimation in Table 7.2. A minor inconsistency exists between the estimation methods FE and RE results for the relationship between TD and ROA. However, the overall alignment gives confidence in the results for the FE estimation of RD and ROA.

The results from the FS and SG control variables for the RE estimation method have a positively significant relationship to ROA. The result for FS is significant at the 1% significance level as it is for the FE estimation method, and SG is significant at the 5% significance level, which is also consistent with the FE estimation. There is a minor inconsistency between the estimation methods FE and RE results for the relationship between TA, SG, and ROA.
However, this is determined to give confidence in the findings from the FE estimation method shown in Table 7.2.

Regarding the RE estimation in Table 7.8 for performance variable ROA, the overall findings show only minor discrepancies compared to the FE estimation in Table 7.2. Therefore, the thesis has a higher confidence in the findings from the FE estimation.

Table 7.8: Random effects with ROA as the dependent variable

Random Effects	(1) ROA	(2) ROA	(3) ROA	(4) ROA	(5) ROA
DEM	-.111***				
	(.034)				
DEB		-.015***			
		(.005)			
STD			-.107		
			(.086)		
LTD				-.166*	
				(.088)	
TD					-.141**
					(.061)
TA	.188***	.184***	.184***	.185***	.184***
	(.022)	(.022)	(.022)	(.022)	(.022)
SG	.002*	.002*	.002*	.002*	.002*
	(.001)	(.001)	(.001)	(.001)	(.001)
cons	-1.139***	-1.127***	-1.131***	-1.127***	-1.12***
	(.106)	(.108)	(.108)	(.107)	(.107)
N	3473	3473	3473	3473	3473
Adj R^2	.174	.170	.168	.170	.171

Robust standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

The last alternative estimation model for the RE is for the dependent performance variable TQ. Firstly, it is seen that the independent debt variable of DEM has a significant negative relation to TQ, which is consistent with the findings of the FE estimation in Table 7.3. Both results are significant at the 1% significance level. However, there is a slight inconsistency between the estimation methods FE and RE results for the relationship between DEM and TQ. However, the overall comparison gives confidence in the results of the FE estimation.

The following independent debt variable of DEB has a significant negative relationship to TQ, which is consistent with the result of the FE estimation in Table 7.3. The results found in the RE estimation are significant at the 1% significance level, but the estimation found in Table 7.3 is significant at the 5% significance level. Furthermore, there is a minor inconsistency between the estimation methods FE and RE results for the relationship between DEB and TQ. However, the overall alignment in findings gives confidence in the thesis' FE estimation results.

Next up is the more specific independent debt variable STD and its relationship to TQ for the estimation method of RE. The findings are aligned with the FE estimation method, which has a significant negative relationship with the 1% significance level. There is a slight discrepancy between the results of the estimation methods FE and RE for the relationship between STD and

TQ. This similarity of results also gives confidence in the robustness of the findings in the FE estimation.

For the last two independent debt variables, LTD and TD, the relationship is non-significant for the estimation RE. This is consistent with the results of FE, and therefore, the thesis is confident in the results.

The findings from the control variables FS and SG for the RE estimation method have a negatively significant relationship to TQ. The result for both control variables is significant at the 1% significance level as it is for the FE estimation method, which is also consistent with the FE estimation. There is a small inconsistency between the results of the estimation methods FE and RE for the relationship between TA, SG, and TQ. This close alignment gives further confidence in the findings from the FE estimation method.

Overall, the RE estimation results align with the FE estimation on all the relationships between the performance and debt variables. Furthermore, the control variables and the relationship to the performance variables for the RE are consistent with the FE estimations.

Table 7.9: Random effects with TQ as the dependent variable

Random effects	(1) TQ	(2) TQ	(3) TQ	(4) TQ	(5) TQ
DEM	-1.737*** (.33)				
DEB		-.103*** (.036)			
STD			-2.391*** (.61)		
LTD				.286 (.858)	
TD					-.983 (.606)
TA	-1.668*** (.217)	-1.752*** (.22)	-1.753*** (.219)	-1.746*** (.219)	-1.741*** (.218)
SG	-.008 (.012)	-.006 (.012)	-.006 (.012)	-.005 (.012)	-.006 (.012)
cons	11.231*** (1.071)	11.465*** (1.088)	11.519*** (1.084)	11.387*** (1.08)	11.476*** (1.08)
N	3473	3473	3473	3473	3473
Adj R^2	.113	.110	.111	.110	.110

Robust standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

The results found in the robustness checks of the alternative estimation methods RE and POLS have significantly increased the confidence of the baseline results found for the FE estimation method. Differences were found for specific debt variables, such as the POLS estimation of the relationship between the performance variable ROA and the debt variables DEM and DEB. The results for these specific debt variables were significantly different from the FE estimation. The rest of the debt variables for the POLS method were aligned with the FE estimation, with only minor discrepancies in the significance levels. Regarding the POLS estimation method, there were differences in comparing the results in the control variables, but a general alignment was found. For the RE estimation method, there were minor differences for the three performance variables ROE, ROA, and TQ, which is deemed to be a positive signal regarding the robustness of the results.

7.2.3 System GMM Results

In the estimation methods, results could still be subject to endogeneity biases. Several studies, such as Papadimitri et al., (2021) have pointed out that the interdependence between leverage and performance could enforce a feedback loop. Here, the concern is that the level of leverage chosen by a firm could be influenced by its performance in each consecutive period, and vice versa; the firm's current performance could be influenced by its historical performance. To address potential endogeneity bias, Papadimitri et al., (2021) suggests using lagged variables and introducing a GMM estimation using the lagged variables. This thesis will follow the Arellano and Bond dynamic panel model, which is expected to ensure the reliability and robustness of the results further (Arellano & Bond, 1991). The results from the two-step System GMM regressions are presented below in three tables, one for each dependent variable. Compared to previous estimations, one notable change in each table is the inclusion of a lagged version of the dependent variable.

Furthermore, in addition to the coefficients, the tables present the results from three tests. Namely, the Arellano–Bond autocorrelation test (lag distance 1 and 2) and the Hansen test for over-identifying restrictions. The Hansen test is used to check the validity of the instruments. As Wintoki et al. (2012) points out, it is worth noting that basing the validity of the System GMM estimation on the results of the AR(1), AR(2), and Hansen test rests on the assumption that the specification is "correct." According to Wintoki et al. (2012), there still might be some unobserved time-varying variable that affects both the dependent variables (firm performance)

and the explanatory variables (leverage), which would bias the GMM estimates. In such cases, the results of the AR and Hansen tests might still indicate a valid specification even though it is not correct (Wintoki et al., 2012).

Firstly, Table 7.10 presents the results of the System GMM estimation done with ROE as the dependent variable. The results are broadly in line with the results from the FE estimations. Specifically, the coefficients of the leverage proxies are similar in magnitude and direction of influence. First, the relationship between DEM and ROE is negative and significant at the 5% level. Next, a significant negative relationship between DEB and ROE is revealed, this time at the 1% significance level. The relationship between STD and ROE is negative and significant at the 5% significance level. This is also true for the relationship between LTD and ROE, which is negative and significant at the 1% significance level. Lastly, regarding the leverage proxies, a negative relationship is revealed between TD and ROE, which is also significant at the 1% significance level.

In addition to the leverage proxies, the direction of influence of the control variables is also similar to the FE estimations. First, a positive and significant relationship between FS and ROE is found across all models - significant at the 1% significance level. A positive relationship is found between SG and ROE, but the relationship is non-significant across all models.

Turning to the lagged version of the ROE, the results clearly show that past performance levels measured by ROE influence present ROE levels. In this case, the relationship is positive and significant across all models at the 1% significance level.

Looking at the model tests, the AR(1) and AR(2) tests for autocorrelation show rejection of the AR(1) null hypothesis but failure to reject the null of AR(2). Wintoki et al. (2012) emphasizes that the crucial diagnostic is to ensure no significant second-order serial correlation in the residuals. First-order serial correlation is, however, expected due to the nature of differencing (Wintoki et al., 2012). Looking at the p-values across all models, both these conditions are met. The results from the Hansen test indicate the validity of the instruments across all models, as we cannot reject the null hypothesis that the instruments are valid.

Table 7.10: System GMM with ROE as the dependent variable

System GMM	(1) ROE	(2) ROE	(3) ROE	(4) ROE	(5) ROE
L.ROE	.699***	.72***	.713***	.704***	.705***
	(.112)	(.107)	(.107)	(.109)	(.106)
DEM	-.141**				
	(.071)				
DEB		-.104***			
		(.023)			
STD			-.466**		
			(.192)		
LTD				-.471***	
				(.147)	
TD					-.441***
					(.129)
TA	.092***	.079***	.085***	.091***	.09***
	(.027)	(.023)	(.024)	(.026)	(.025)
SG	.001	.001	.001	.001	.001
	(.001)	(.001)	(.001)	(.001)	(.001)
_cons	-.538***	-.454***	-.5***	-.522***	-.503***
	(.163)	(.145)	(.15)	(.158)	(.149)
Observations	2869	2869	2869	2869	2869
No. of groups	234	234	234	234	234
No. of instruments	22	22	22	22	22
AR(1)	0.013	0.011	0.013	0.014	0.014
AR(2)	0.341	0.346	0.342	0.340	0.344
Hansen j-test	0.496	0.481	0.467	0.498	0.459

Robust standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

Moving on to the results from the estimations with ROA as the dependent variable shown in Table 7.11, the System GMM estimations start to differ from the FE estimations. As determined by System GMM, leverage is less influential on firm performance than estimations done by FE. A positive relationship between DEM and ROA is found but is non-significant. This contrasts with the FE estimation, in which a significant negative relationship was found. The relationship between DEB and ROA is negative and significant at the 5% significance level, similar to the FE estimation. As for the relationship between STD, LTD, TD, and ROE, all coefficients are negative but non-significant. This is also different compared to FE, where a significant relationship was found between STD, LTD, and ROA.

Including a one-period lagged version of ROA has a positive relationship with ROE. The result is significant across all models. Just as with the lagged version of ROE, this shows that the past value of ROA has a positive influence on the present level of ROA.

Looking at the control variables, the coefficients of FS and SG are positive and significant across all models, however, with varying degrees of significance. This result is similar to the results derived from the FE estimation. Furthermore, the AR and Hansen tests indicate that the models do not suffer from any second-order serial correlation or overidentification.

Table 7.11: System GMM with ROA as the dependent variable

System GMM	(1) ROA	(2) ROA	(3) ROA	(4) ROA	(5) ROA
L.ROA	.821***	.823***	.821***	.82***	.821***
	(.04)	(.04)	(.041)	(.04)	(.041)
DEM	.005				
	(.016)				
DEB		-.007**			
		(.003)			
STD			-.001		
			(.044)		
LTD				-.062	
				(.049)	
TD					-.035
					(.032)
TA	.034***	.034***	.035***	.035***	.035***
	(.009)	(.009)	(.009)	(.009)	(.009)
SG	.001**	.001**	.001**	.001**	.001**
	(.001)	(.001)	(.001)	(.001)	(.001)
_cons	-.202***	-.2***	-.203***	-.204***	-.202***
	(.049)	(.05)	(.05)	(.05)	(.05)
Observations	2869	2869	2869	2869	2869
No. of groups	234	234	234	234	234
No. of instruments	22	22	22	22	22
AR(1)	0.000	0.000	0.000	0.000	0.000
AR(2)	0.612	0.614	0.611	0.613	0.612
Hansen j-test	0.269	0.264	0.270	0.264	0.267

Robust standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

Finally, the System GMM was also estimated with TQ as the dependent variable to strengthen the robustness of the results found in the FE estimation. Looking at the coefficients of the relationship between the leverage proxies and TQ in Table 7.12, similar results to FE are again apparent. First, a negative significant relationship between DEM and TQ is consistent with the FE results. Second, a significant negative relationship is found between DEB and TQ, which is also consistent with FE. The same applies to the relationship between STD and TQ. LTD shows no significant influence on TQ, which was also the case with FE. Finally, a negative relationship is found between TD and TQ, contrasting the findings of FE that revealed a non-significant relationship.

Moreover, the lagged value reveals a positive influence on present levels of TQ at the 1% significance level. Hence, after testing three different firm performance measures, a pattern seems to emerge indicating that past firm performance significantly influences present firm performance.

As for the control variables, FS and SG are negatively related to firm performance, with varying significance levels. The relationship between FS and TQ is aligned with the results derived from the FE estimations. However, SG, now being significant, is different. An important thing to mention is the low p-values of the Hansen test. As mentioned before, rejecting the Hansen test indicates that the model might not be valid.

Table 7.12: System GMM with TQ as the dependent variable

System GMM	(1) TQ	(2) TQ	(3) TQ	(4) TQ	(5) TQ
L.TQ	.639*** (.096)	.65*** (.095)	.656*** (.095)	.649*** (.096)	.65*** (.094)
DEM	-1.126*** (.336)				
DEB		-.084** (.036)			
STD			-1.809** (.741)		
LTD				.012 (.557)	
TD					-.671* (.392)
TA	-.311*** (.078)	-.344*** (.084)	-.341*** (.084)	-.346*** (.085)	-.337*** (.082)
SG	-.025** (.012)	-.025** (.012)	-.025** (.012)	-.025** (.012)	-.024** (.012)
_cons	2.619*** (.604)	2.645*** (.622)	2.655*** (.621)	2.631*** (.622)	2.651*** (.611)
Observations	2869	2869	2869	2869	2869
No. of groups	234	234	234	234	234
No. of instruments	22	22	22	22	22
AR(1)	0.000	0.000	0.000	0.000	0.000
AR(2)	0.337	0.342	0.346	0.343	0.342
Hansen j-test	0.100	0.080	0.088	0.078	0.087

Robust standard errors are in parentheses
**** p<.01, ** p<.05, * p<.1*

Based on the System GMM estimations, the results align with those of the FE. When estimating the relationship between the leverage proxies and ROE, the results were similar to FE. The results, however, started to differ when ROA was used, as the relationships of the System GMM estimations were much weaker. Finally, as TQ was used as the performance measure, the results were again broadly in line with FE. In addition to the relationship between the leverage

proxies and the firm performance measures, a lagged version of the firm performance measures was also used. The lagged version of firm performance showed a significant and positive influence on present values of firm performance in all three instances.

8 Conclusion

Capital structure and the optimal balance between debt and equity remain a cornerstone in corporate finance. Over the years, several theories have tried to identify what drives firms to pursue debt or equity financing or a mix of both. Ultimately, one of the firm's core goals is to maximize firm value, and evidently, the choice of financing plays a significant role in doing so. Hence, one of the critical questions of this thesis was to analyze the role of financial leverage and its impact on firm performance.

Consistent with several prior studies, our research found an overall negative relationship between financial leverage and firm performance for listed Swedish SMEs. This is consistent with one earlier Swedish study by Yazdanfar & Öhman (2015) and several other research papers such as (Majumdar & Chhibber, 1999; Goddard et al., 2005; Asimakopoulos et al., 2009; Boshnak, 2023; Le & Phan, 2017; Pandey & Sahu, 2019; Papadimitri et al., 2021). The results are, however, inconsistent with the studies of (Gill et al., 2011; Park & Jang, 2013 Abdullah & Tursoy, 2021; Margaritis & Psillaki, 2010). The tendency is that the studies that found a significant positive relation between leverage and firm performance all have data samples from developed markets. Therefore, the findings do not confirm the tendency of some developed markets to have a positive relationship.

The theoretical landscape of financial leverage and firm value only partially agrees with our findings. While classic theories like Modigliani and Miller’s propositions and the trade-off theory propose a positive role for debt due to tax shields, our empirical data suggest otherwise. We found that the negative impact of leverage on performance may stem from increased agency costs, the risk of financial distress, and other market-specific factors.

The sample comprised an unbalanced panel with 3473 firm-year observations from 2019 to 2023 across eight industries, excluding financial and real-estate sectors. The final set of variables consisted of three firm performance measures: ROE, ROA, and TQ; five leverage variables: DEM, DEB, STD, LTD, and TD; and two control variables: FS and SG. Inspired by previous empirical results and model tests, the primary method used for inference was FE. In addition, POLS, RE, and System GMM were used to test the robustness of FE results, ensuring the validity and reliability of the findings.

The study followed a hypothesis testing method to test the relationship between different combinations of leverage and performance variables. Based on this, seven hypotheses were developed following previous empirical studies. An overall negative relation was expected when looking at the accounting performance measures ROE and ROA. However, the relationship between STD and ROE, as well as TD and ROA, was expected to be positive. Following the results of the primary method of inference, FE, many of the results were in line with these expectations, suggesting an overall negative relationship between leverage and firm performance. Some results were, however, contrasting to these results. First, the positive relationship expected between STD and ROE was instead found to be significantly negative. Secondly, the positive relationship expected between TD and ROE was also found to be negative. Third, a non-significant relationship was found between STD and ROA. Finally, a significant negative relationship between TD and ROA was found, contrary to an expected positive relationship. When looking at the control and performance variables, an overall positive relationship was found, which aligns with the hypotheses. Although the control and performance variables had an overall positive relationship, the regression with TQ showed a negative relationship with FS and a non-significant relationship with SG. Although slight discrepancies became apparent between the robustness checks made using the three alternative model specifications and the baseline result, the overall results were still the same: an overall negative relationship between leverage and firm performance.

According to M&M proposition I, leverage should have no impact on firm performance, and extending to proposition II, leverage should positively impact firm performance due to the tax shield on debt. The findings of this thesis go against both these theorems and suggest that the tax shield on debt is not enough to sustain profits. According to trade-off theory, financial leverage should positively impact firm performance, at least up to a certain point, where increasing debt leads to financial distress. Demonstrating the existence of an optimal point was not covered in this thesis. However, since the average ratio of STD and LTD is very low while still showing a negative relationship to firm performance, it suggests that the optimal leverage point is also low. Staying in the branch of the trade-off theory, the intuition behind the inverse relationship could also be found in the agency theory, specifically in relation to the increased agency costs of debt and the risk of bankruptcy. Lastly, the pecking order theory could indicate that more profitable firms tend to use less debt because they have sufficient internal funds, and the company pays a premium for the debt due to asymmetric information. Looking more empirically at the relationship, another reason could be found in the difference in the cost of debt

between SMEs and large firms, as described in Section 3.4. This difference could impair the competitiveness of SMEs when compared to larger corporations and, therefore, affect firms' performance.

Furthermore, the sample period 2019 to 2023 included both the COVID-19 pandemic and the Ukraine War, which impacted many firms, especially SMEs. Thus, higher leverage in such volatile times could lead to greater financial distress and explain part of the negative relationship between leverage and firm performance. This is also the conclusion of Simerly & Li (2000) that found a negative relationship between leverage and performance in unstable macroeconomic environments.

9 Research Implications and Limitations

The following section aims to address the implications of the thesis results, both in the interest of the listed Swedish SMEs and politicians. In addition to addressing the implications of the thesis, the study's limitations will also be laid out. This is to ensure transparency and acknowledge certain constraints.

9.1 Implications for Swedish SMEs

As mentioned, the findings from this thesis indicate a general negative relationship between all forms of debt financing and firm performance for Swedish SMEs from 2019 to 2023. As the sample period is relatively recent, a general argument can be made for the current Swedish SMEs, to some extent avoid debt financing. This is not the case for all Swedish SMEs, as there will be exceptions, but the findings indicate that, generally, debt financing will negatively affect the Swedish SME's performance. One of the reasons that there will be situations and companies where this does not apply is that the study does not consider the macroeconomic impact on different industries. Several studies have shown that using macroeconomic indicators as model parameters helps explain firm performance. Furthermore, industries have varying leverage needs and could respond differently to debt financing. For example, industries such as *Energy* and *Materials* are more reliant on debt, as shown in section 6.2, most likely due to the nature of their assets.

Swedish SMEs should consider using other kinds of financing rather than debt financing, which also is the case. Data from Bloomberg (2024) show that Sweden is the country in the world with the second most rights issues in the world, closely following Australia. This could indicate that the Swedish SMEs are already on a path where they are deviating from debt financing and instead maneuvering the risk of external equity financing. The findings from this thesis also indicate that Swedish SMEs should at least not be utilizing debt financing and may be considering further exploring external equity financing options. The implication of this is highly dilutive equity issues, which are more at the expense of the shareholders that can be put in a distressed position (Bloomberg, 2024). Although equity financing is a diluting option, it can be a more strategic option that can add more value beyond capital.

An argument could also be made regarding the political implications of this thesis's findings, pointing to the need for change. Currently, it is not generally in the interest of listed Swedish SMEs to consider debt financing, which could also result from political regulations and legislation. Overall, Swedish SMEs do not benefit from the different debt options when measured on performance, which could be one reason for them utilizing external equity financing instead.

9.2 Limitations and Suggestions

This thesis has attempted to quantify the relationship between leverage and firm performance. Although many considerations have been taken to achieve a reliable thesis, limitations exist. Therefore, caution should be exercised when interpreting the results.

- As the thesis is limited to the country of Sweden, the arguments presented can be difficult to generalize for other markets or countries. This is especially compared to less established countries with newer financial markets and less stringent regulations. Naturally, more opportunities for financing will be available in countries like Sweden, where investor culture and liquidity are superior to those of European peers (Knight, 2021). However, if the results of the thesis were to be used in a broader context, there would likely be a need for a comprehensive analysis of the regulatory constraints and possibilities to ensure similarities with the Swedish market.

- The data used in the thesis only covers 2019 to 2023, which limits the findings to this period. Furthermore, some high-volatility periods are included in the sample period, which naturally affects the results. One example is the Ukraine war, followed by a period of high uncertainty and volatility. This was also highlighted in section 3.3. In addition to filtering the sample based on period, specific observations were also dropped. First, this included the observations of financial and real-estate firms, which was done to achieve a uniform sample following previous empirical studies. Therefore, nothing can be concluded regarding the firms in these sectors. Second, some firm-year observations were excluded from the analysis due to incomplete data, resulting in the potential loss of information that could have impacted the findings.

- Inference has been made using a combination of variables specific to this thesis. First, using other variables to measure firm performance or leverage could result in different

findings. In addition, several previous studies may have used the same variables but with slight calculation deviations. Hence, this must be considered when comparing this thesis's results to those of previous empirical studies.

- Section 6.2 showed that the sectors were heavily tilted toward Health Care and Information Technology. The thesis has, therefore, taken the characteristics of these specific sectors into account when interpreting the results. Furthermore, it is essential to acknowledge the bias toward these sectors when compared to other countries and markets where the sector bias is different.

Based on the limitations mentioned above, several directions for future research can be taken. First, expanding beyond Sweden to include cross-country analyses involving established and emerging markets could provide valuable insights. Secondly, the sample period could be extended beyond the five years of data included in our sample. This could help mitigate some of the short-term volatility seen in this period. In terms of robustness, exploring alternative metrics for measuring firm performance and leverage could help validate the findings of this thesis. Another robustness check would be to address the sector bias towards the *Health Care* and *Information Technology* sectors found in our sample. Lastly, a more detailed analysis of regulatory frameworks across various would also be valuable, offering insights into how different policies influence financing opportunities and market behaviors.

10 References

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