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Leverage Dynamics and Determinants of Private Limited Companies in Sweden and Germany

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This thesis paper analyzes the determinants and dynamics of leverage of private limited firms in Sweden and Germany during the period from 2004 until 2012. Our results show that leverage ratios of private limited firms are mean-reverting and persistent over longer time periods. When comparing public firms to their private peers, we find that the latter are more prone to suffer from problems of asymmetric information, which makes access to capital markets harder for them. Further, we find similar significance for leverage determinants of public and private limited firms. We also find that profitability, tangibility, firm size and industry characteristics count for a large amount of the variance of leverage of private limited firms. Further, our results indicate that on average more than 50% of the Swedish and more than 20% of German private limited companies are not levered.

Keywords: private limited firms, leverage determinants, leverage dynamics, capital structure

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1. Introduction

The capital structure determinants of companies and its dynamics are an important field in research and practice. Originating in 1958 with Modigliani and Miller's publication on the capital structure irrelevance principle, this area of research has sparked the interest of many researchers (e.g. Myers, 1977; Myers and Mayluf, 1984; Baker and Wurgler, 2002). The attempt to explain the rationale behind capital structure led to the conception of different theories and models. Depending on the time when studies are conducted and what sample data is selected varying results are obtained and different factors seem to be important for capital structure policies. This explains why the debate about the optimal capital structure is still ongoing and has not forfeited its importance. Despite the extensive research on capital structure, most publications focus exclusively on publicly listed companies. Private companies are largely disregarded, even though their importance cannot be neglected in most economies.

With our thesis we intend to close this gap in academic literature. When comparing public firms to their private peers, we find that the latter are more prone to suffer from problems of asymmetric information, which makes access to capital markets harder for them. In the light of these observations, our paper sets out to examine whether we still can find affinities between public and private companies. Therefore, we examine whether capital structures are persistent amongst different types of firms over the entire sample period, reflecting distinct preferences for leverage. Furthermore, our study analyses whether the determinants of capital structure, which have been applied in the examination of public firms, can explain the change in leverage of private firms using an OLS regression. In the third part of our analysis we examine the phenomenon of "zero-leverage" firms using a logistic regression. In terms of the existence of different leverage levels a similar outcome is observed for the two samples of Swedish and German firms as for public firms. In addition, we find that leverage of private firms can be explained by the same determinants as in the case of listed companies. However, individual firm characteristics seem to explain the variation in the case of unlisted companies more precisely.

The remainder of the paper is structured as follows: Chapter 2 gives an overview of the major capital structure theories and the phenomenon of zero-leverage firms. In Chapter 3, we

show the main differences between public and private firms, illustrate the corporate landscape in Germany and Sweden and point out reasons why private firms are important for research. Chapter 4 consists of the description of the dataset and the methodology. Chapter 5 presents the descriptive and empirical analysis of our dataset. In the descriptive part we reiterate on the persistence of capital structure. Subsequently, we examine whether the capital structure of a private limited company is influenced by the same factors as public firms. The last part is dedicated to zero leverage firms. Chapter 6 summarizes our findings, points out the strengths and shortcomings of our study, and provides implications for future research.

2. Literature Review

The optimal capital structure of a company represents one of the most intensely discussed topics in the research of corporate finance. In 1958, Modigliani and Miller pioneered the field with their publication about the optimal capital structure of firms and extended it by the incorporation of market imperfections (taxes) in 1963. In their papers they argue that in perfect capital markets the degree of leverage used by a company has no impact on firm value. In this chapter we present the most important theories and developments in capital structure research, comment on different approaches and discuss the relevant literature.

2.1. Trade-Off Theory

According to the trade-off theory a firm makes its decisions regarding the optimal capital structure on the basis of costs and benefits of debt (Berk and DeMarzo, 2011). Myers (1984) claims that a firm first selects a target leverage ratio, which is deemed optimal, and consequently aligns its current capital structure to it. In an optimal state the marginal costs of debt equal its marginal benefits (Frank and Goyal, 2007). Early research in the field focuses on the benefits a company can obtain by using debt to shield profits from taxation (Kraus and Litzenberger, 1973). In accordance with Kraus and Litzenberger (1973) other researchers also find evidence that there is a positive relationship between the marginal tax rate of a firm and the likelihood to issues debt (e.g. Graham, 1996; Myers 1984; Mackie-Mason, 1990). As taxes on interest income are smaller than taxes on capital gains, Miller (1977) notes, that this is mainly of interest for enterprises and not for individual investors. Graham (2000) confirms this in his paper and estimates the average present value of a tax shield to be 9.7 % of firm value in the US. As high levels of debt lead to costly financial distress for the firm (Berk and DeMarzo, 2011), the amount of leverage, that a firm is able to use, is limited. Andrade and Kaplan (1998) find that the loss in value in case of a bankruptcy amounts up to 20% of the previous firm value.

Even though most of the early papers use models on trade-off theory that are intuitively reasonable, some questions remain unanswered. For example, static models are not able to explain the ambiguity between leverage and risk (e.g. Bradley, Jarrel and Kim (1984)). Other critics point out that models cannot be applied to multiple periods and, therefore, do not allow

for an adjustment process or the fact that retained earnings are disregarded (Frank and Goyal, 2007). As the two deficiencies discussed above have led to considerable discontent in the research of trade-off theory, several professionals decided to pursue another approach in order to explain the observed characteristics. In one attempt, Jensen and Meckling (1976) explain the leverage behavior of a company by introducing agency theory into this field of research. Agency theory describes the so called principal-agent conflict, which can arise between the owner of the company and the manager. As the actions of the manager cannot be observed, he has an incentive to run the firm in his own best interest. Those might be contrary to the objectives of the investors. The theory predicts that instead of investing large free cash flows in the best way, the manager might rather prefer to engage in self-serving actions as for example empire building (Berk and DeMarzo, 2011). Those actions are likely to decrease the value of the firm. In this situation debt can have the positive side effect of aligning the managers' interests to the ones of the shareholders as the accumulating interest payments are reducing the free cash flow and are increasing the threat of financial distress (Jensen, 1986). A negative side effect of financial distress is that it can lead to conflicts between the two investor groups, based on their individual risk appetite. As shareholders are holding an implicit call-option, they may be in favor of projects, which are uncertain and volatile. Since equity holders gain on the expense of debt holders in this situation a so-called asset substitution problem arises (Gavish and Kalay, 1983). However, if the firm has a lot of debt outstanding equity holders might refuse to finance a project even though it has a positive net present value, since they would not benefit from the proceeds. This situation is described as debt-overhang problem (Tirole, 2006). As a consequence creditors ask for a higher return to be compensated for the risk taken.

In more recent studies of capital structure authors have turned to dynamic trade-off models, acknowledging the fact that firms normally are persistent over several time periods and reconsidering taxes and bankruptcy costs as capital structure determinants. The first dynamic trade-off theories are introduced by Hamada et al. and Brennan and Schwartz in 1984. As both models disregard transaction costs, firms are able to adjust their capital structure instantly back to the optimum after an external shock has occurred. The firms in the model have higher leverage ratios than observed in reality. Fischer et al. (1989) extend the dynamic trade off theory by introducing a model, which explicitly takes transaction costs into account. They find that the firms in his model allow the capital structure to drift in a confidence band.

The "width" of those bands depends on the size of transaction costs and alters considerably with the small changes in those (Fischer et all., 1989). Furthermore, research reveals that volatility is negatively related to the average leverage of a company and good performance can lead to increased debt issues (Leary and Roberts 2005). Hennessey and Whited (2005) contrast these results, as they find leverage to be path dependent, whereas Strabulaev (2007) concludes that firms' capital structure decisions are more influenced by long-run changes in value instead of short term equity fluctuations.

2.2. Pecking Order Theory

According to Myers (1984) the preferred order in which firms raise capital can be explained by the prevalence of asymmetric information in capital markets. Based on the asymmetric information problem developed by Myers and Majluf (1984) the theory assumes that a firm always chooses to finance its investments by internal financing before turning to the market to raise the capital needed for its investments. When using outside financing the firm strictly prefers debt over equity. Akerlof (1970) explains this by the notion of adverse selection. According to his theory investors lack complete information about companies in the market. Therefore, they are not able to assess the quality of a firm or to calculate its fair value. Hence, they apply a general discount, when evaluating the price of financial securities. From the firm's perspective the management has an incentive to make decisions which are benefiting current shareholders, such as issuing securities at the highest price possible. As the issuance of undervalued securities harms current shareholders, such an event can be perceived as a signal that the price of the company's securities exceeds the fair market value. In order to avoid giving out securities at a discount, firms can eliminate existing information asymmetries. Still, additional costs have to be incurred when making this information available. Therefore, financial slack is valuable for a firm as it does not need to deal with any market frictions when financing investments out of its retained earnings.

Fama and French (2002) confirm the pecking order theory with their findings that companies, which are more profitable and firms with fewer investment opportunities pay out more dividends. Therefore, more profitable firms have lower leverage and dividend payments do not vary to accommodate short-term variation in investment (Fama and French, 2002). Even though Shyam-Sunder and Myers (1999) confirm the results by proving a strong

correlation between the internal financing needs and the issuance of debt, the original findings of Myers and Majluf (1984) have not been uncontested. For example, Frank and Goyal (2003) show that the outcomes of the seminal study cannot be replicated for all firms independent of their stage in the company life cycle. Even though mature firms perform as forecasted by Myers and Majluf (1984), pecking order theory does not apply to young firms. Albeit this result can be explained by the limited debt capacity and the constrained firm capital of young firms, it shows that it is hard to apply the same theory to all firms. Therefore, one might conclude that this theory is an explanation for the capital structure of mature firms with low investment needs and stable cash flow as Myers and Majluf (1984) already predicted. Leary and Roberts (2010) however, criticize the fact that this theory does not account for changes in the respective industry median, as this is the most important variable when the leverage of a specific company is predicted. Furthermore, Frank and Goyal (2007) are raising concerns about the overall applicability of the model as it does not take important determinants of capital structure, like size or tangibility, into account. We thus conclude that the theory can explain the financing decisions of firms. At the same time we should be careful when applying it to our sample.

2.3. Market Timing Theory

After Taggart (1977) already realized the importance of market values of long-term debt and equity as determinants of capital structure, Baker and Wurgler (2002) develop a model, which looks at the capital structure as result of cumulative past undertakings by the firm to time the equity market. According to theory a firm uses equity as primary financing instrument, when the firm's stock is overvalued. Vice versa, it buys back shares if the firm's stock is undervalued and it is cheaper to issue debt instead (Berk and DeMarzo, 2011). The authors claim that if external financing options seem undervalued to mangers, they even engage in the creation of artificial financial slack to eventually be prepared for future investments. The model by Baker and Wurgler (2002) is in line with previous research by Jung, Kim and Stulz (1996), Loughran and Ritter (1997), Jegadeesh (2000), Hovakimian et al. (2001) as well as Denis and Sarin (2001). According to their research, firms are inclined to issue equity when the companies' share price resides above its historical average. As firms lower their costs of capital by succeeding in their attempts to time the market (Elliot et al., 2008), the model cannot account for the rationality of investors. Baker and Wurgler (2002) point out a second

way how firms' capital structure can be explained by the cumulative past events of equity market timing. In their assertion they introduce a multi-period model of the already discussed pecking-order theory. Assuming that adverse selection costs change in correlation with book-to-market ratios (across firms or time), firms are inclined to issue equity, when their book-to-market ratios are low. As it is relatively expensive for a firm to adjust its capital structure actively, this might explain the phenomenon as well (Baker and Wurgler, 2002). A third explanation can be derived from the papers published by McConnell and Sarvaes (1995) and Stulz (1990). They claim that firms decide to issue more equity when book-to-market ratios are low, as they want to avoid a debt holdup problem. This view is contradicted by Elliot et al. (2008), who apply a model developed by Rhodes-Kropf et al. (2005) to their sample in order to distinguish between the effects of growth options and mispricing of the market. In their paper they are able to show that the mispricing component can explain the security choices to a large extent (Elliot et al., 2007).

Recently Morellec, Nikolov and Schuerhoff (2012) find that entrenchment theory as an additional possible explanation of the capital structure puzzle. In their view managers finance their perks by issuance of equity in good times. However, in bad times the lower leverage makes financial distress less likely to occur, which increases the job security of managers. Consistent disagreement exists about the speed of adjustment after an equity issuance amongst different researchers. Whilst Huang and Ritter (2009) conclude that actions have long lasting effects on the firm's leverage, other researches (e.g. Leary and Roberts (2005); Flannery and Rangan (2006); Kayhan and Titman (2007); Alti (2006) and Hovakimian (2006)) find that the changes in capital structures are not persistent. Even though market-timing is used in practice and managers are able to enjoy cheap financing from it (Graham and Harvey, 2010), a recent publication of Yang (2013) claims the overall deadweight loss due to excess financing to be 15.6% of firm value as the firms do not orientate themselves on the optimal leverage anymore, but allow the capital structure to deviate significantly.

2.4. "Zero-Leverage" Firms

In recent years some researchers shifted their focus to a relatively new phenomenon in the field of capital structure, so-called zero leverage firms. As the number of firms following this policy seems to be steadily increasing (Bessler et. al., 2013) and the motives behind cannot be

fully explained by traditional theories (Yang, 2013), we discuss this phenomenon in brief to give insight in the state of this sub-category of the research field. Graham (2000) finds that many of the unlevered firms are large and in possession of sufficient liquidity to finance their business. Furthermore, the firms are not likely to experience financial distress in the near future. Still they are profitable enough, that the waiving of debt left relatively large tax benefits unused. Those are estimated in a study of Korteweg (2010) to be about 5.5% of firm value. In another contribution to this topic Minton and Wruck (2001) state that those firms can be found in any industry, even though firms in industries, that are likely to be hit by financial distress, include more zero leverage firms. Marchica and Mura (2010) as well as DeJong et al. (2011) report in their papers that those firms oftentimes save their debt capacity in order to use it in times when resources are tight or the firm needs additional funds for large investments. As managers of unlevered firms do not have to fear the negative consequences of financial distress Starbulaev and Yang (2013) introduce managerial entrenchment as a reason for firms to stay unlevered. They prove this by a study, which examines 14,327 US firms between 1962 and 2009 trying to relate the CEO friendliness of the boards or CEO ownership to the capital structure. Still, the results are confirmed by other studies, such as Devos et al. (2012) and Byoun and Xu (2013). Bessler et al. (2013) dismantle incitements for a zero leverage policy by dividing them into supply and demand side factors. Former ones are dependent on the leverage strategy chosen endogenously by the firm. The latter depend on the willingness of external creditors to lend money to the firm instead. According to the paper, supply side factors are the main reason, why firms are not levered up. This means unlevered firms oftentimes do not actively go for a zero-leverage policy, but are forced to adopt it, as they are not deemed to be creditworthy by the market and therefore have to look out for other forms of financing.

Bessler et al. (2013) claim that there are multiple contingencies, which lead to the emergence of firms, which are passing on being levered. First, several institutional and country specific factors can foster the development. Countries with a common law origin, high creditor protection, and a dividend imputation or dividend relief tax system are more likely to be home to a relatively high amount of zero-leverage firms. Another reason for a sample to exhibit many zero leverage companies is a preceding series of IPOs. Also a legislative decision, like the decrease of corporate taxes (which also reduces the use of interest tax shields) makes running a firm without debt more attractive. Other factors include the

increase in asset volatility or industry specific effects, which leads to an increased debt conservatism amongst firms in the respective sector (Bessler et al., 2013).

3. Corporate landscape and the importance of private limited firms

3.1. Private versus public limited firms

According to the European Commission and Eurostat (2001, p.15) small and medium sized firms (SMEs) are the backbone of European economy. SMEs are responsible for half the revenues on EU level. Furthermore, they employ about 50% of the European workforce. As those companies often are not publicly listed but private, and research on the capital structure of such companies has been very limited up until now, we believe that it is time to investigate this field. We want to devote this section to comparing private companies to their public peers and pointing out the important similarities and differences.

In prevailing literature most sources (e.g. Brav, 2009) find that private firms are significantly higher levered than their publicly traded counterparts. In order to explain this difference research has come up with several theories. Stulz (1988) and Amihud et al. (1990) focus on differences in ownership structure in order to explain leverage dynamics. They find that the ownership structure of publicly listed firms is more dispersed than in private firms. As private firms are often controlled by a major shareholder, who is afraid of giving up control by issuing additional equity, this might explain the preference for debt over equity among this type of firms (Brav, 2009). As in publicly traded companies ownership and management are separated most of the time, Brav's argument can also be used to explain the controversial behavior of listed firms. As the power of a single shareholder declines with increasing ownership dispersion, the management has an incentive to finance its undertakings by the issuance of equity (Francois and Morellec, 2004). Other than differences in the valuation of control, the relative and absolute cost of control is one motive to assert the contrasting observations. Brav (2009) develops the idea of level and sensitivity effects in his paper. According to him it is relatively cheaper for private firms to incur debt instead of equity from external capital markets (sensitivity effect). At the same time private firms still face higher costs (in absolute terms) to (re-)finance themselves via external capital markets in comparison with publicly traded firms (level effect), which is a reason why private firms are likely to be found further off their optimal refinancing points (Goyal et al., 2011). Whilst the sensitivity effect can be interpreted and explained as an extended model of the pecking order theory (Myers, 1984), the reasons for the occurrence of the level effect can be found in several

disquisitions. Brav (2009) is one of the first researchers, who decided to examine the structural difference in the capital structure between private and public companies. In his analysis he concludes that the discrepancies must be explained by agency theory and/or asymmetric information. According to him financing costs are higher for private firms as the information asymmetries between private firms and shareholders are larger than between publicly listed companies and their investors. This is true since the latter firm types have to obey stricter reporting standards (Brav, 2009). As more transparency minimizes the information asymmetries between the firm and its investors the discount applied to the company's debt or equity is reduced as well. Another reason why privately owned firms face larger premia when accessing external financial markets is that their debt and equity is not as marketable in comparison to obligations of listed firms (Block, 2007). According to Brav (2009) this difference leads to greater sensitivity of the capital structure of private firms in terms of fluctuations in their performance.

Holmstrom and Tirole (1997) find that macroeconomic and institutional variables are deemed to have a large impact on the capital structure of private firms. Further, prevailing creditor protection is important (Giannetti, 2003). According to Goyal et al. (2011) this difference between the two firm types is especially pronounced in countries with a strong legal system, where legal rights are enforced thoroughly. Goyal et al. (2011) show that private firms rely more heavily on short-term loans than on long-term debt. Reliance on trade credit is also higher compared to public firms. Furthermore, they discover that the leverage of private firms is more negatively related to past profitability, which can be explained by their less active adjustments. At the same time, the disadvantage of cost that private firms face due to restricted access to external capital markets implies that leverage of private firms is less sensitive to factors that are known to affect target leverage ratios, such as firm size, asset tangibility and firm growth rates (Goyal et al., 2011). These results are consistent with Frank and Goyal (2009), who show on an aggregate level that private firms rely more on retained earnings and bank debt than public firms do.

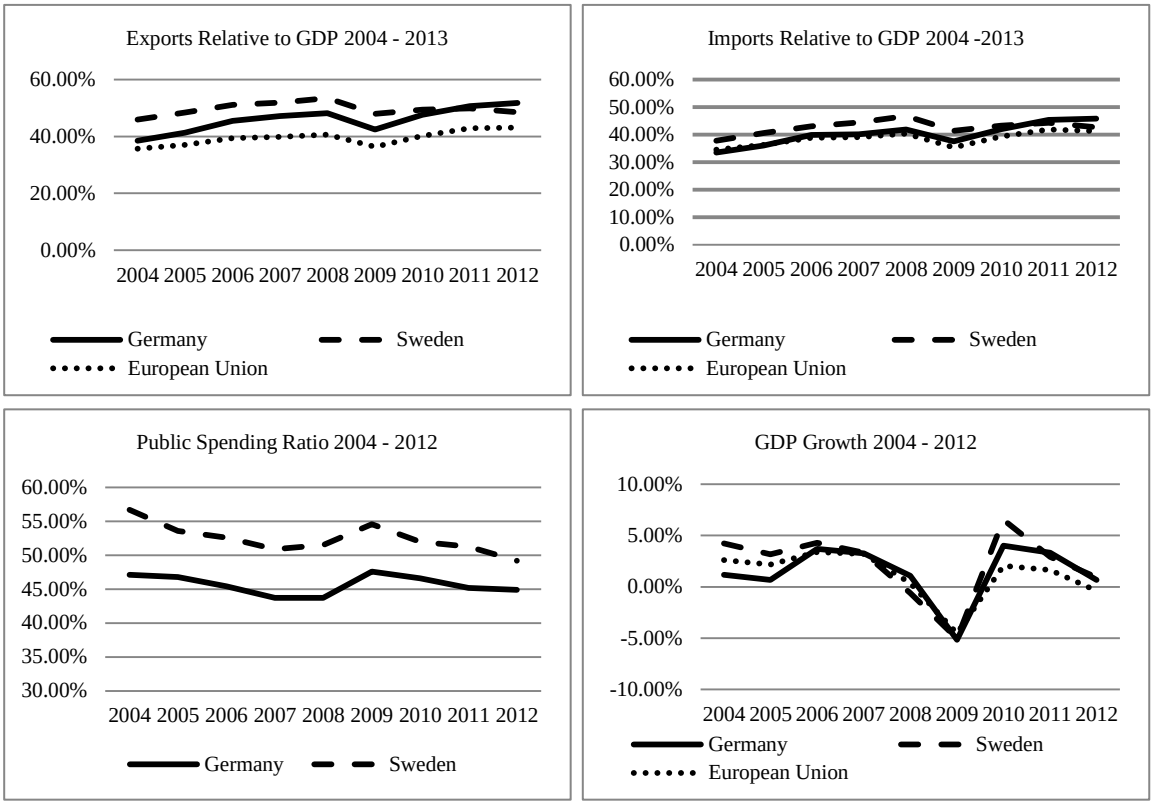
3.2. Comparison of Germany and Sweden

In order to give the reader an idea about the environment of our studies we briefly want to introduce the economies and their development in recent years. Furthermore, we go into the requirements which have to be fulfilled in order to found a private limited company.

Even though the size of the population of Germany and Sweden is unequal, there are many similarities. As members of the European Union they both have adopted a stable democratic system. Political risk as well as the risk for international business is considered to be very low (The PRS Group, Inc., 2013a; The PRS Group, Inc., 2013b). Germany as well as Sweden are said to be investor friendly countries (Market Line, 2013a; Market Line, 2013b), where foreigners can establish and invest in companies without any restrictions. Alongside with legal changes, both countries try to increase the attractiveness for foreign investors. These results are confirmed by the World Bank (2013a, 2013b), which ranked the two countries (amongst the 189 economies analyzed) on the overall positions 14 (Sweden) and 21 (Germany). As the main interest of our examination is the composition and the development of capital structures, we want to mention that according to the report, it is easier for firms to get credit in Germany than in Sweden (World bank, 2013b). Both economies are strongly export oriented. In 2012, Germany exported goods and services amounting to 51.8% of its GDP. Sweden's exports corresponded to 48% of the country's GDP. Both values are above the average exports of the member states of the European Union of 43%. As exports exceeded imports both states had a positive trade balance of almost 6%. Because the main trade partners of both countries are the European Union and the US, the decrease in exports in 2009 can be attributed to the economic crisis at this period. This also has a direct impact on GDP growth in 2008 and 2009 (The PRS Group, Inc., 2013a; The PRS Group, Inc., 2013b). Both economies consist almost exclusively of service and industrial businesses. Merely a small part of the countries' GDP is generated in the primary sector.

Figure 1: Macroeconomic Environment

The figure below provides information about the Macroeconomic environments of Germany and Sweden. We report the imports and exports relative to the GDP, the public spending ratio and GDP growth for our sample years. For the statistics on exports, imports and GDP growth the respective figures or the whole European Union have been added.



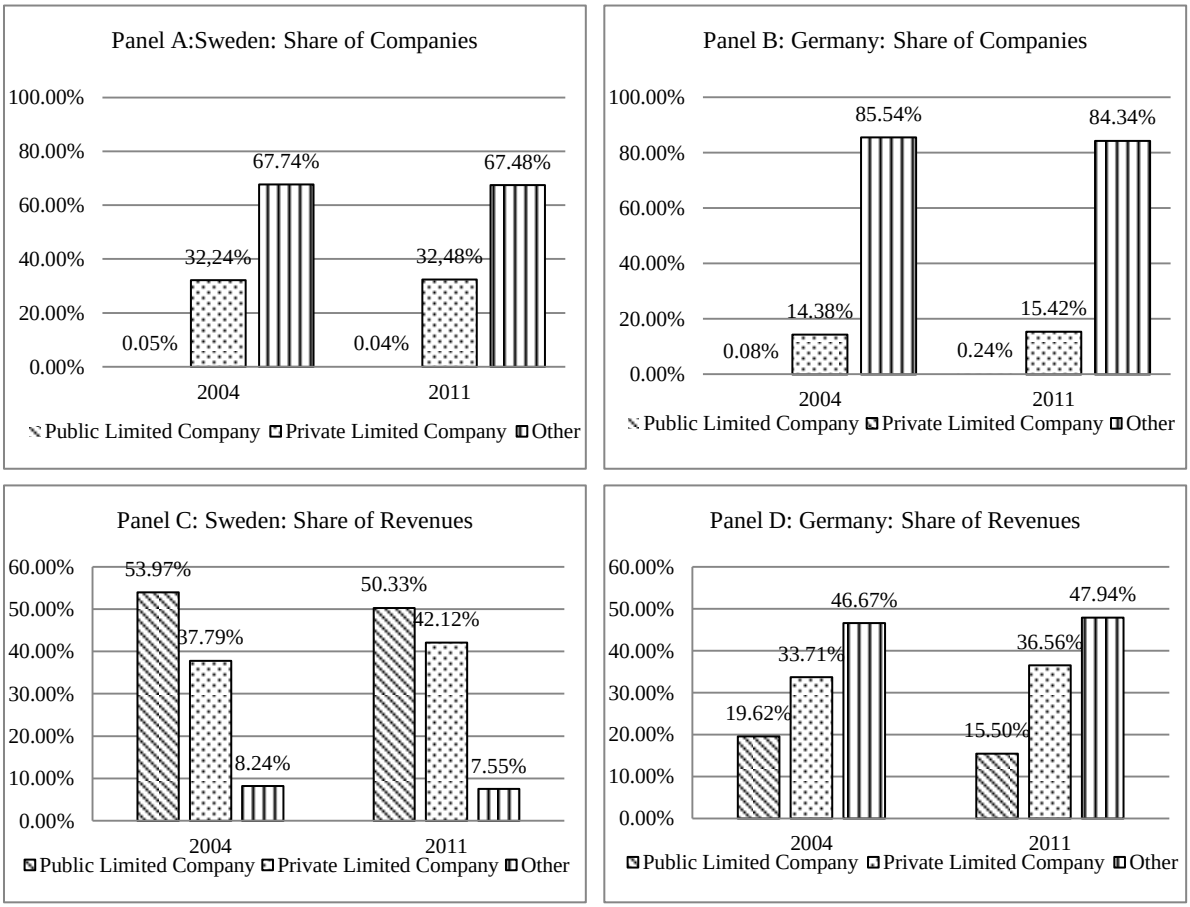
Source: World bank (2013c); own illustration

In 2012 Germany's GDP was composed to 67.9% of services, to 31% of industrial sector activities and only to 1.1% of agriculture (MarketLine, 2013a). Sweden's economy is even relying stronger on the service sector, as this sector counts for 71.5% of the GDP. Industrial and agricultural sectors account for 26.7% and 1.8% in 2012 (MarketLine, 2013b). Historically, Sweden had a high public expenditure quota, which has been reduced in recent years. At the same time Sweden has efficiently reduced its debt to commendable 38% of its GDP, whereas Germany has indebted itself to a large extend (81% of its GDP in 2012). This is a consequence of the efforts to support the crisis shaken partner states of the European Monetary Union. Still, rating agencies have not lowered their credit ratings of Germany, as they believe in the strength of its economy. The key to the success of the two countries can be explained by the efforts to foster innovative spirit. In the latest Innovation Scoreboard Report of 2013 Sweden and Germany are qualified as the two most innovative countries amongst all EU member states (MarketLine, 2013b). Another reason why Germany has overcome the

crisis relatively fast is often attributed to its abundance in small and medium sized enterprises (SMEs). One fundamental difference between the countries is that Sweden has its own currency (the Swedish crown), whilst Germany is a member of the European Monetary Union (EMU). This has the advantage for Sweden that it is not directly affected by the sovereign debt crisis of the EMU. Still, its status of a safe haven for investors led to large capital inflows, provoking an appreciation of the Swedish Crown, which made exports more expensive and harmed the economy in turn (MarketLine, 2013b). On the other hand Germany is more exposed to crisis-affected economies and the banking sector is more prone to suffer from external shocks (MarketLine, 2013a).

Figure 2: Overview on Firm Environment

The figure below gives an overview over the firm environments in Germany and Sweden in 2004 and 2011. Panel A and B show the distribution of firms by type in the e respective country. Panel C and D show how the revenues are distributed across the different firm types.



Source: German Federal Statistical Office (2014); Swedish Companies Registration Office (2014), own illustration

In 2011 about 15.4% of the companies in Germany decided to register as private limited companies (GmbH) and contribute to the overall revenues by more than one third (36.56%). A look at Swedish economy leads to a similar and even more pronounced result. In Sweden private limited companies (Aktiebolaget Privat) represent almost a third of all registered companies and account for more than 40% (42.12%) of the revenues in the economy. Even though the number of public limited companies has been increasing with relation to private limited companies in both markets in recent years, the latter category is still prevalent.

A basic characteristic of a private limited liability company is that it is registered as a legal person. Therefore, in case of a bankruptcy the owners are only liable to the amount of capital paid into the company. In order to fund a private limited company, most legislations demand a minimum capital amount to be paid in at formation. Whilst in Germany this principal amount is 25,000 Euros, Swedish law demands a 50,000 Swedish crowns (≈ 5,600 Euros). As the required registration, reporting standards and organizational processes are more complicated in the case of a limited company in contrast to other private company forms; it is relatively more expensive to run a private limited company. Those costs might be high enough for some entrepreneurs to outweigh the benefits of the limited liability feature. Even though the German government tried to create incentives to found limited companies in recent years by making processes simpler, the majority of the companies are still not registered in such a form. The fact that Sweden features a higher percentage of private limited companies can be attributed to several factors. First, the capital, which has to be contributed to found the company, is smaller and the reporting standards in Sweden are simpler and the processes take less time on average (World bank, 2013a; World bank, 2013b). Furthermore, the efforts of managing different kinds of private companies does not differ much. That is why the limited liability option that an entrepreneur receives by registering a private “Aktiebolaget” instead of a sole trader business is relatively cheap regarding the additional effort. In turn this might backfire as the single company in Sweden might have a harder time to obtain external financing, as lower setup costs for an entity reduce the commitment and therefore the credibility of an average entrepreneur.

4. Data and Methodology

4.1. Data

All data for the analysis has been downloaded from the Orbis (Bureau van Dijk) database. The database provides information about private and publicly listed companies on an annual basis. We were able to assess the latest ten years of data. For our sample we selected all observations of Swedish or German private limited companies from the industrial sector disregarding actual status[1]. The data derived includes asset, equity and debt values as well as several items from the income statement. In particular, we retrieve the following variables: fixed assets, tangible assets, intangible assets, long-term debt, loans, shareholders` equity, capital, other shareholders` equity, total assets, cash and short-term investments, sales and EBITDA. For our analysis we calculate profitability (EBITDA/ total assets), size (natural logarithm of sales plus one[2]), the book leverage ratio (total debt/ total assets), tangibility (tangibles/ total assets) and industry median (median leverage ratio of the industry) on an annual basis. As many of the sample firms had not reported their results for 2013 at the time we extracted the sample, we disregard those observations and restrict our sample to 2004 to 2012. In addition, we remove all firm-year observations from the sample, which have zero total assets value, since zero asset value implies no business activity. Further we drop firm-year observations with total debt greater than total asset, total asset less than cash, negative cash and negative sales. This procedure is in line with best practices in research (e.g. Halling, Yu and Zechner, 2012) Due to regulations in the energy sector, we also take out all firms relating to this industry. In order to reduce the influence of extreme outliers on our results, we winsorize tangibility, profitability and leverage at the 1% and 99% level. In Table 1 and 2 we report summary statistics and industry statistics on our data for Germany and Sweden respectively below.

[1] This corresponds to the business form of a private Aktiebolaget (AB priv.) in Sweden. Under German company law this type of business is called "Gesellschaft mit begrenzter Haftbarkeit" (GmbH)

[2] We decided to use ln(sales+1) as size factor as this gives us the opportunity to capture firms, which do not make any sale in a given year within the sample for the regression. If we defined the size of a company as ln(sales), we would lose firm year observation with zero sales, as the natural logarithm is not defined. Consequently those observations would be dropped in the regression analysis. As opposed to this the effect of a one unit increase in sales is negligible due to the properties of logarithmic function.

Table 1: Summary Statistics by Country

The following table presents a summary of the sample data. As the private firm data we originally retrieved was of low quality, we had to process the data first in order to make it useful for the statistical analysis. The Swedish sample is based on 1,621,228 firm year observations. For the German sample 362,160 observations are available. All data has been downloaded from Orbis (Van Dijk) database and includes all (suitable) firm year observation for all German and Swedish industrial companies of the past nine years (2004 – 2012). Indication in the table are given in ten-thousands of Euros.

Panel A: Sweden	Mean	Std.Dev	Min	Max
Shareholder Funds	14628	8090	0	5070000
Other Shareholder Funds	10476	3140	-17900	1430000
Assets	31213	7570	0	1930000
Intangible Assets	2137	1910	0	1550000
Tangible Assets	11346	7520	0	4880000
Fixed Assets	16525	5200	0	1560000
Cash	2369	696	0	586000
Capital	883	602	-4	482000
Long-Term Debt	4852	1850	-21	622000
Loans	823	462	-15	222000
Current Liabilities	10768	2550	-45	511000
Debt	5675	2010	0	622000
Sales	35633	7490	0	1450000
Ebitda	3212	986	-196000	321000
Panel B: Germany	Mean	Std. Dev	Min	Max
Shareholder Funds	87081	15100	0	5270000
Other Shareholder Funds	75325	14800	-122000	5220000
Assets	230000	31200	0	10200000
Intangible Assets	13387	4220	0	670000
Tangible Assets	60001	6600	0	1480000
Fixed Assets	116000	20700	0	4880000
Cash	15260	2760	0	1220000
Capital	11895	1110	-14100	205000
Long-Term Debt	42832	12400	-33	3650000
Loans	8435	999	0	157000
Current Liabilities	64981	7210	-133	1080000
Debt	51267	12600	0	3650000
Sales	471000	35300	0	3250000
Ebitda	32943	3270	-135000	459000

Table 2: Summary Statistics by Industry Group

The table below presents the distribution of the observations in our sample over different industry groups. We report the absolute and relative number, as well as the total number of observations for each sample. As we had to preprocess the original data, we only report the summary statistics of our dataset used in the statistics. All data has been downloaded from Orbis (Van Dijk) database and includes all (suitable) firm year observation for all German and Swedish industrial companies of the last nine years (2004 – 2012).

	Sweden		Germany	
	Absolute	Relative	Absolute	Relative
Agriculture	49155	3.0%	2730	0.8%
Mining	2626	0.2%	1000	0.3%
Manufacturing	159924	9.9%	79034	21.8%
Construction	201801	12.4%	54440	15.0%
Retail & Wholesale	332071	20.5%	87495	24,2%
Transportation	89462	5.5%	18199	5,0%
Accommodation & Food	57172	3.5%	4288	1.2%
Tele, Media and IT	101813	6.3%	16153	4.5%
Other Services	546531	33.7%	98816	27.3%
Undefined	80672	5.0%	5	0.0%
Total	1,621,227		362,160	

4.2. Methodology

4.2.1. OLS-Regression

In our analyses on the factors influencing the capital structure of a company, we first examine the influence of different determinants described in the section above on a firm, which is not following a strict zero-leverage policy over the entire sample period. Therefore we exclude all firms with an average leverage of zero from the sample. In line with previous research on public firms (e.g. Frank and Goyal, 2009) we focus on the most important factors and, therefore, investigate the effect of profitability, tangibility, size and industry characteristics on leverage. We are confident that those determinants represent a good selection, as their importance is underscored by the results of several former studies (e.g. Rajan and Zingales, 2007). Furthermore, many of those studies (e.g. Rajan and Zingales, 2007; Frank and Goyal, 2009; Lemon et al., 2008) use sample data from firms operating in developed countries. As those countries are similar from a macroeconomic point of view, we believe that these variables represent a good basis for examining the capital structure of private firms.

Consequently we formulate the following regression:

$$Leverage_{i,t} = \alpha + \beta X_{i,t-1} + \delta_i + \lambda_t + \varepsilon_{i,t}$$

$$\begin{pmatrix} Profitability \\ Tangibility \\ Size \\ Industry\ Median \end{pmatrix}$$

Equation 1: OLS-Regression

We use lagged values to account for management basing its decisions on known data from the previous period. Firms are indexed by i and periods by t. $X_{i,t-1}$. is a set of control variables. $Leverage_{i,t}$ represents the leverage at time t, α is the axis intercept of the regression line and β is a vector of regression coefficients of $X_{i,t-1}$, the vector of lagged firm-specific determinants. In order to control for serial and cross-sectional correlation in our sample we introduce the variables λ_t and δ_i to control for time and firm-fixed effects. $\varepsilon_{i,t}$ denotes a random error term. In order to account for heteroscedasticity we use robust standard errors.

4.2.2. Logistic Regression

In our second regression, we want to investigate the phenomenon of zero leverage firms further. In contrast to the majority of firms, those firms never make use of leverage, even though their economic and financial constitution would allow them to do so (Strabulaev and Yang, 2013). Therefore we are interested to find out whether we can explain the adoption of a zero-leverage policy by the variables already used in the first equation.

For the analysis we use the full samples, including all firms disregarding their leverage policy and specify the following regression equation to test[3]:

$$Zero\ leverage_{i,t} = \alpha + \beta X_{i,t-1} + \gamma ZLFI_{i,t} + \varepsilon_{i,t}$$

$$\begin{pmatrix} Profitability \\ Tangibility \\ Size \end{pmatrix}$$

Equation 2: Logistic Regression

Firms are indexed by i and periods by t. $\mathbf{X_{i,t-1}}$. is a set of one-year lagged control variables. The intercept of the regression line is represented by α and $\boldsymbol{\beta}$ is a vector of regression coefficients of $\mathbf{X_{i,t-1}}$, the vector of lagged firm-specific determinants. The variable Zero Leverage Firms in Industry (ZFLI) indicates how prevalent the phenomenon of zero leverage is in the different industry groups of our sample. In accordance with Strabulaev and Yang (2013) we do not lag this variable, as they state that managers can observe this tendency in real time. Again $\boldsymbol{\varepsilon_{i,t}}$ denotes a random error term. As we transform our dataset to cross sectional format for this test, we dismiss the fixed-effect variables included in equation one.

4.2.3. Tests for Multicolliniearity and Robustness of the Sample

We perform several robustness tests of our results. A criterion for an unbiased OLS estimator is low multicollinearity of the explanatory variables. Since firm-specific variables are likely to follow a similar trend they might be subject to multicollinearity. We determine variance inflation factors in order to find the severity of multicollinearity in our OLS regression models.

$$\text{Variance inflation factor} = \frac{1}{1 - \mathrm{R}^2}$$

This factor is obtained by regressing one explanatory variable on all other firm-specific explanatory variables. In general, severe degrees of multicollinearity are indicated by variance inflation factors of five or above (Kutner, Nachtsheim and Neter, 2004). As long as the

[3] In the original model of Strabulaev and Yang (2013) the authors include additionally a dummy variable, which indicates whether a firm is first observed as without leverage. We dismiss this variable in our application of the model, as it does not take the time it takes for a firm to convert its capital structure into account.

correlation among the explanatory variables is low, the results are reliable. Since we find variance inflation factors around one for Germany and Sweden respectively we conclude that our estimators are not subject to multicollinearity and our results are robust.

The results of our multicolliniearity tests are reported in the appendix. To validate the results obtained further, we conduct several additional robustness tests. In particular, we compile robustness test for subsamples by industry and by time for our regressions. We report those results separately in the appendix, but comment on them in section 5.

4.3. Discussion of Leverage Determinants

Our analysis is based on book leverage ratios as managers usually rely on this variable for decision making. This is due to the fact that debt is rather supported by the assets in place than by growth opportunities (Myers, 1977). Another reason is that estimates on the current market value of private firms are hardly available, as they are not constantly traded. We define leverage as short-term interest bearing liabilities plus long-term interest bearing liabilities over total assets. As obligations (e.g. accounts payable) or some of the liabilities (e.g. pensions) do not necessarily serve as financing but primarily as transaction sources, we exclude them from our calculation of leverage, as this can distort the assessment of the capital structure of a company (Rajan and Zingales, 1995). Further, we define total equity as the sum of shareholders` funds, capital and other shareholders funds. A description of the definition of the single variables can also be found in the appendix.

In our analysis of leverage determinants of private firms, we build on the research of Rajan and Zingales (1995) and Frank and Goyal (2009) We investigate the impact of profitability, tangibility, size and the industry median on leverage for our private firm samples. In our analysis we exclude market-to-book assets ratio since this variable is not available for private firms and expected inflation since it is the least reliable factor due to the lack of confidence. In turn we go into the single factors and discuss what effect they should have on leverage:

The effect, which is attributed to the profitability of a firm, depends strongly on the theoretical framework, on which the analysis is based on. According to Jensen (1986) a more profitable firm should be able to finance its undertakings and expenditures through internal instead of external financing, which should be desirable for the firm according to the pecking

order theory. This result is confirmed by Titman and Wessels, (1988) who find that firms that were more profitable in the past have lower debt ratios. In contrast, trade-off theory suggests the opposite relation between profitability and leverage. As a profitable firm is less likely to face financial distress and is able to benefit more from the tax shield in comparison to a firm, which is not profitable (Frank and Goyal, 2009). Therefore, profitability should be positively correlated with leverage. In a dynamic setup those classical explanation lose their validity (Strabulaev, 2007). Instead Strabulaev (2007) suggests that the market takes the present profitability of a firm as an indicator for its future profitability. In turn the market value of the firm`s equity should increase and the leverage should automatically decrease.

According to the theories mentioned above, size can have an impact on the leverage of a firm in several ways. As a large firm is likely to be better diversified than its smaller counterparts, one is able to assume that the cash flows are more stable and the risk of bankruptcy is reduced. Furthermore, it might enjoy a better reputation on the market (Frank and Goyal, 2009). In line with the trade-off theory large firms should be able to enjoy the benefits of leverage by exploiting their tax shields. However, Titman's and Wessel's (1988) results point in the opposite direction. According to their research large firms are able to rely on internal financing. Like in the case of profitability this should lead to the result that large firms are less levered on average. Such a negative relation between size and leverage would be in line with the pecking order theory.

In contrast to the preceding variables, the tangibility of assets has been unequivocally positively related with leverage for several reasons. As the value of tangible assets is better accessible, it is easier for creditors to estimate the liquidation value of the collateral of a company. This also limits or removes information asymmetries. In line with the pecking order theory, this should facilitate the access to external financing sources, in which debt would be preferred to equity. Furthermore, Frank and Goyal (2009) point out that the firms with more tangible assets tend to have higher leverage due to more predictable cash flows.

By using the median industry leverage as our fourth variable, we account for inter-industrial differences. This is true since we expect that companies within the same industry are influenced by the same factors, such as regulatory environment and business risk, and characteristics, such as capital intensity. Thus they have similar capital requirements. Additionally, managers benchmark the leverage of their own firms to other competitors (Frank and Goyal, 2009) and adjust those averages actively (Hovakimian et al., 2001). In

section 5 we explain the observed effects in greater detail and relate characteristics of the individual industry to them.

As most of the variables for our logistic regression (profitability, tangibility and size) are also used in the OLS model, we do not discuss their implications in great detail again. However, we want to mention that we expect to find similar trends as in our first regression model. This seems reasonable to us, as firms that switch from being levered to being unlevered reduce their leverage. Therefore, we conclude that even though the adoption or rejection of a zero-leverage strategy is an extreme case of altering the capital structure the reasons related to the variables already described should be the same.

In our logistic regression model the average amount of firms that are unlevered by industry and year replaces the industry median previously introduced in our first regression. By changing variables we account for the popularity of adopting a zero leverage policy in each industry. Next to this we are able to determine whether a firm's choice of capital structure is influenced by its industry peers or individual characteristics of a certain industry. The introduction of this variables follows he approach of Strabulaev and Yang (2013). For us it seems reasonable to alter the leverage characteristics of the single firm to a binary variable, as our interest in this regression is to find out, whether a general change in preferences for following a zero-debt policy, will affect the single firm in its decisionmaking. Still, the argument for this should follow the lines of the median industry leverage. Therefore, industry characteristics should lead to different preferences for being levered or not. Furthermore, we believe that the benchmarking behavior described by Frank and Goyal (2009) is also applicable when deciding on the zero-leverage cases.

5. Analysis and Interpretation of Results

After outlining the models used for the analyses, we first provide a descriptive analysis in order to show how capital structures of firms develop over the whole sample period. Subsequently we turn to the interpretation of our empirical results. In both parts we aspire to compare our results to the findings of prior research to compare private and public companies and to comment on country differences between Sweden and Germany.

5.1. Descriptive Analysis

In order to analyze the development of leverage over time we start by determining, which firms are reporting their leverage ratios in the first sample year (2004). On the basis of these observations we divide the firms according to their leverage ratios. In the case of the German sample we form four groups of equal size and calculate the mean leverage of the quartiles. For the consecutive years we do the same (for all firms reporting in 2004), but categorize the individual firms according to the quartile they have been allotted in the initial period. Firms, which do not report results in the consecutive years, drop out of the sample. This yields one subsample for each year and country, which describes the different leverage groups in the respective year. In order to make changes in leverage over time visible, we combine all nine subsamples. Since we find that more than 2 quarters of our initial firm observations carry zero leverage in our Swedish sample, we have to adjust our method slightly. As we cannot allot firms without leverage to four different quartiles according to their initial reporting, we form three groups instead, whereby the lowest group is a pooled version of firms, which are initially unlevered. The other firms are then allotted into a medium levered and a high levered group. The other steps in the calculation are the same as in the case of the German sample. Results are reported in Figure 3 Panel A and Panel C. Additionally we conduct the same analysis for all firms, which are reporting in all nine years of our sample (see Figure 3 Panel B and Panel D).

In this analysis we discover that leverage ratios exhibit a significant amount of convergence over time. German firms with very high and low leverage both tend to move towards moderate leverage ratios. After nine years, the low book leverage subsample has increased from 0% to 8%, whereas the very high subsample has decreased from 59% to 33%. Swedish firms with high leverage also tend to decline to lower levels (from 39% to 25%),

whereas medium levered and former non-levered Swedish firms increase their leverage ratios slightly. Keeping in mind that the pooled average of the lowest group consists out of firms, which were initially unlevered, we conduct another short analysis on Swedish sample to find out how prevalent the phenomenon of zero-levered firms is. Therefore, we calculate the average leverage of a Swedish firm, which is reporting in 2004 over the whole sample period. We find that 31.4% of all firms, will not take on any debt over the entire sample period. In the Swedish survivor sample this trend is approximately equally reflected, as 31.8% of this group do not lever up until the year 2012. For completeness we conduct the same test on the German sample and find that less German companies are levered in the first period and that the phenomenon over going unlevered is less persistent over the entire sample period. In our German sample only 3.6% of the companies followed a strict zero-leverage policy over the entire time.

These findings are partly consistent with the findings of Lemmon et al. (2008), who analyzed the evolution of leverage ratios of public firms. They also find that leverage ratios tend to converge over time. A reason for the mean reversion of leverage ratios is the active management of leverage ratios (Lemmon et al., 2008; Flannery and Rangan, 2006; Hovakimian, 2006; Kayan and Titman; 2007). Further, the leverage ratios of their sample firms remain relatively stable over longer periods, which is consistent with our findings in both countries. Notably, most of the convergence occurs in the first 3 years after the sample formation period (2004), which can be seen from the flattening slope over time (see Figure 3).

Although the leverage ratios are converging, they remain significantly different from each other. The leverage ratios only decreased slightly from 2008 to 2010 in the German sample whereas there seems to be no effect in the Swedish sample. Similar results are reached on a sample of public firms by Roberts, Lemmon and Zender (2013). Naturally, firms do drop out of the sample due to bankruptcy, buyouts or acquisitions.

In order to validate our statistics we run several tests on our data. First we are examining whether the leverage effect described is only due to the size of companies. In order to control for this we use the same model as before but divide the firms on the basis of their sales in the initial peiod (2004). As the results do not mirror the outcomes of our first descriptive statistics, we conclude that there is no relation between size and leverage over the whole sample period.

Figure 3: Development of Leverage over Time

The figure below present the development of leverage over time for our two samples. All firms which reported their leverage in the initial period of the samples downloaded from Orbis (Van Dijk) have been divided into groups according to their amount of leverage in the initial sample period. In our attempt to show, how leverage evolves over the entire sample, we keep those groups fixed and report the average leverage of the respective group in every sample year. In the normal samples we take all firms reporting into consideration, In the survivor sample only firms reporting in very year of the sample are included. The German sample is split up into quartiles according to the leverage ratios of the firms in 2004. For Sweden we find more than 50% of the firms in the initial year to carry no debt. As we cannot distinguish in this case by using quartiles , we group all firms without leverage in one group (Category: Low) and distribute the levered firms on the groups "Medium" and "High".

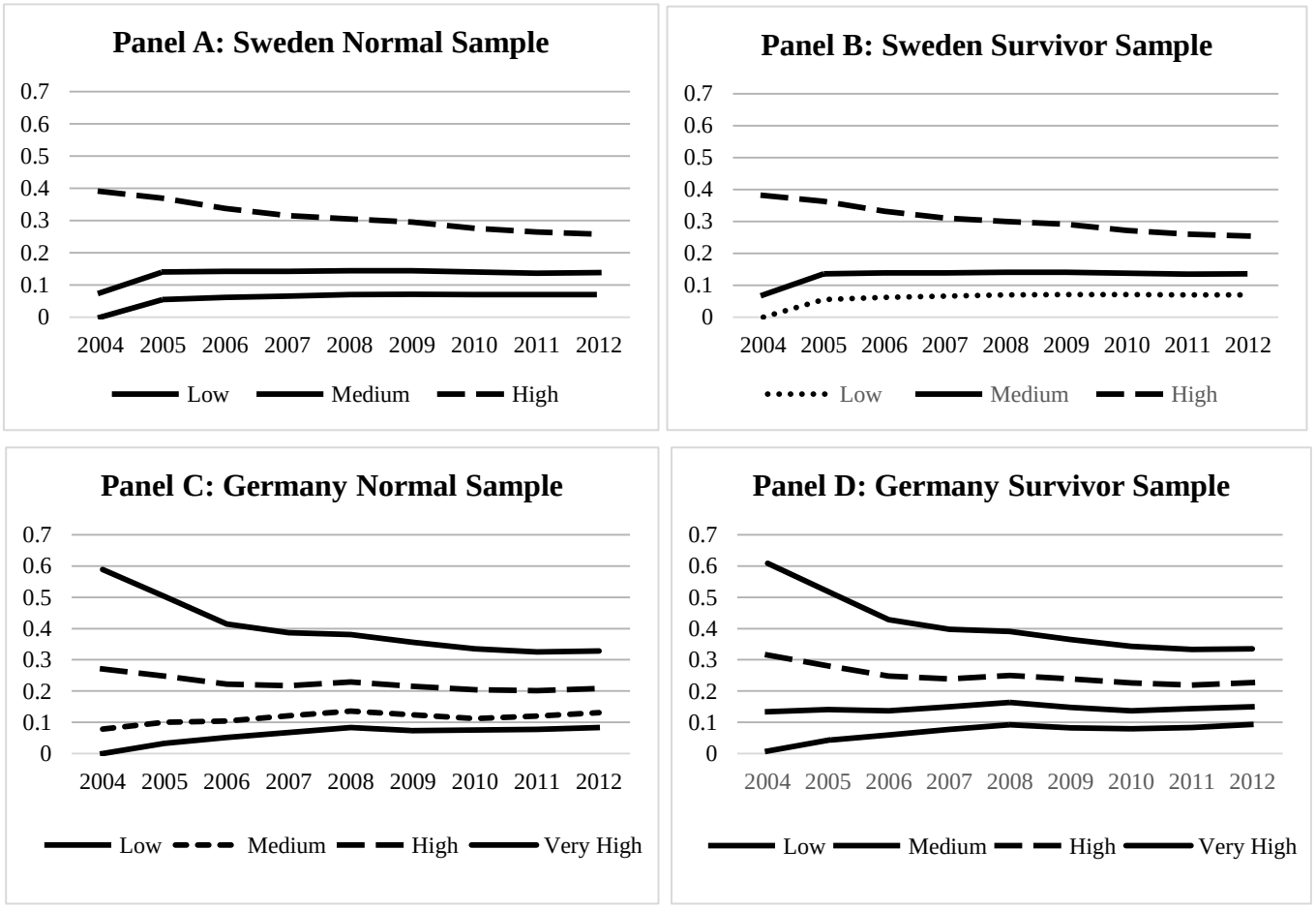


Table 3: Relative Share of Non-Levered Companies by Time and Industry

In the table below we report the relative amount of firms in each industry and year. The data has been obtained from the Orbis (Van Dijk) database and comprises observations from 2004- 2012. Panel A shows the relative percentagesfor Swedish unlevered companies. Panel B shows the relative amount of German companies, which where unlevered in the respective years and industries.

Panel A: Relative Share of Companies without Leverage Sweden 2004 - 2012										
	Agriculture	Mining	Manufacturing	Construction	Retail & Wholesale	Transportation	Accomodation & Food	Tele, Media & IT	Other Services	Total
2004	39.57%	45.34%	47.92%	58.38%	55.23%	38.27%	59.15%	81.94%	76.45%	61.90%
2005	26.16%	33.33%	39.11%	46.72%	44.99%	25.63%	43.91%	71.85%	64.74%	51.08%
2006	26.13%	34.39%	39.89%	46.93%	45.35%	25.44%	41.97%	72.23%	64.76%	51.44%
2007	26.65%	32.73%	40.87%	47.70%	45.71%	26.10%	42.50%	73.16%	65.34%	52.23%
2008	26.93%	34.95%	41.70%	48.20%	46.23%	26.79%	42.45%	74.17%	65.75%	52.94%
2009	27.07%	35.67%	42.20%	48.86%	47.42%	27.38%	42.40%	74.92%	66.46%	53.81%
2010	28.01%	33.55%	43.36%	49.63%	48.22%	28.30%	42.83%	75.16%	66.95%	54.78%
2011	28.34%	34.92%	44.17%	50.21%	48.83%	28.51%	44.79%	75.27%	67.31%	55.20%
2012	27.95%	34.82%	45.02%	49.73%	48.97%	29.03%	45.30%	75.42%	67.39%	55.29%
Total	28.46%	34.95%	42.90%	49.57%	47.89%	28.27%	44.63%	74.94%	67.20%	54.35%
Panel B: Relative Share of Companies without LeverageGermany 2004 - 2012										
	Agriculture	Mining	Manufacturing	Construction	Retail & Wholesale	Transportation	Accomodation & Food	Tele. Media & IT	Other Services	Total
2004	11.93%	27.27%	16.21%	17.31%	20.10%	17.98%	24.84%	33.89%	26.77%	21.09%
2005	16.93%	16.88%	19.09%	21.40%	24.78%	19.95%	33.11%	36.80%	31.50%	25.16%
2006	18.27%	21.93%	23.01%	25.27%	28.64%	24.42%	35.53%	44.55%	36.30%	29.44%
2007	17.92%	26.77%	21.48%	22.62%	29.45%	24.89%	36.01%	43.37%	34.27%	28.36%
2008	16.01%	25.00%	20.67%	21.05%	28.57%	23.55%	34.45%	40.96%	32.98%	27.17%
2009	14.52%	21.99%	22.82%	23.19%	30.20%	24.62%	35.49%	42.76%	34.40%	28.92%
2010	13.10%	23.45%	22.73%	23.03%	30.47%	25.10%	31.53%	44.80%	35.43%	29.32%
2011	9.25%	18.25%	21.62%	21.94%	29.41%	23.00%	32.63%	43.24%	34.23%	28.13%
2012	12.64%	13.92%	21.28%	21.12%	27.18%	21.56%	28.93%	40.10%	31.08%	26.07%
Total	14.38%	21.90%	21.47%	22.28%	28.51%	23.37%	33.17%	42.03%	33.71%	27.73%

As it is puzzling that many private firms have no leverage, we investigate this phenomenon further and compile an analysis of the frequency of zero-leverage firms. We follow the definition from Strabulaev and Yang (2013), who define firm i in year t as zero-leverage firm if in that year the outstanding amounts of both short-term debt and long-term debt equal zero. The results are illustrated in Table 3. For example, column 2 of Table 3 shows the total amount of Swedish firms that have zero leverage in each year between 2004 and 2012. On average, 54.35% of the Swedish and 27.73% of the German firms have zero leverage.

Strabulaev and Yang (2013) as well as Bessler et al. (2013) believe that zero leverage is strongly industry specific. Table 3 illustrates our results. One can see that Accommodation & Food, Tele, IT & Media as well as Other Services are the industries with the largest amount of zero leverage firms for both Germany and Sweden respectively. These findings are not surprising. On the one hand some industries, such as construction and transportation, are more capital intensive than others. Thus, those industries require more external financing. Since private firms have limited access to equity capital markets (Brav, 2009) debt financing is naturally the most common option. On the other hand some industries are less creditworthy than others. For example, firms in the service industry rarely have many tangible assets, thus, they face more difficulties in obtaining debt financing. Still industry characteristics do not answer our question why financially unconstraint firms with zero leverage exist.

5.2. Analysis of OLS-Regression

In order to find out, whether levered private limited firms base their decisions on capital structure on similar variables as their public peers, we compile an OLS-regression model as outlined in the methodology. In Table 4 and Table 5 we report the results of all regression specifications. Due to the fact that we can only exclude possible serial and cross-sectional correlations in the fourth specification, we limit our analysis and interpretation to the model which includes time- and firm fixed effects. Another reason for using this specification is that it provides the largest explanatory power amongst all four in both country samples. The version without any fixed effects carries an adjusted R-squared[4] of only 10.4% for Germany and 24.3% for Sweden and in the model including time fixed effects 10.6% for Germany and 24.3% for Sweden. In contrast to that, we find a high adjusted R-squared for the model specification including firm fixed effects (70.2% for Germany and 71.3% for Sweden) and in the model setting including both time fixed effects and firm fixed effects (71.4% for Germany and 72.2% for Sweden).

For Germany, we find statistically significant results for profitability, tangibility, size and the industry median at a 1% level (Table 5). For Sweden, we discover statistically significant results at a 1% level for all variables except for industry mean (Table 4). In the following analysis we investigate the results further, explain them in terms of existing capital structure theories and elaborate on the similarities and differences compared to the research based on public limited firms.

As in the research of Kayhan and Titman (2007) profits and leverage are negatively related to each other. Therefore, firms which have been profitable in the previous year, should exhibit a smaller leverage ratio. Our explanation of this property is that successful firms use the profits made in previous years to reinvest in their business. This decreases the need for outside financing, as long as the amount of dividends paid to shareholders, the money spent on business expansions or saved, is not exceeding the profits. In line with the pecking order theory (Myers, 1984) our sample firms seem to draw on internally generated funds to finance

[4] We decided to use the adjusted R-squared in order to measure the explanatory power of the model, because the different regression models rely on a different number of independent variables. The simple (unadjusted) R-squared is due to its mathematical properties increasing whenever more of those variables are added, even though the explanatory power does not increase. Quite contrary, the adjusted R-squared only increases, if the explanatory power increases.

their business activities before they tap on outside financing. Research on public firms has found similar evidence (e.g. Lemmon et al., 2009; Frank and Goyal, 2009). We find the previous years' profitability to have the third largest effect amongst our four testing variables. According to statistics a one percent increase in profitability leads to a decrease in leverage of 6.35% in the Swedish and 7.85% in the German sample.

Table 4: Leverage Determinants Sweden

This table presents correlation coefficients between leverage measures and the leverage factors used in the first part of our regression analysis for our Swedish sample. We report the results of all four regression specifications used in this table. Specification one only features the basic set of variables (profitability, tangibility, size and industry median). In specification two firm-fixed effects are added. In specification three we regress leverage on the basic variables as well as on time-fixed effects. Specification four comprises all factors (basic, time- and firm- fixed effects). Standard errors are reported below the coefficients in brackets. Firm fixed effects are not displayed in the table. Basic variables are defined in the appendix and are lagged by one year. The data was downloaded from Orbis (van Dijk) database.

	Specification 1	Specification 2	Specification 3	Specification 4
Profitability	-0.130***	-0.0605***	-0.130***	-0.0635***
	(0.00124)	(0.00117)	(0.00124)	(0.00117)
Tangibility	0.400***	0.231***	0.399***	0.225***
	(0.00101)	(0.00207)	(0.00102)	(0.00210)
Size	-0.00183***	0.00227***	-0.00189***	0.00238***
	(0.000113)	(0.000192)	(0.000113)	(0.000193)
Industry Median	0.174***	-0.0494***	0.185***	-0.0107
	(0.00323)	(0.00743)	(0.00337)	(0.0166)
2005 (base year)			0	0
			(0)	(0)
2006			-0.0137***	-0.00186
			(0.00102)	(0.00143)
2007			-0.0114***	-0.00360***
			(0.000997)	(0.00136)
2008			-0.00524***	-0.00114
			(0.000989)	(0.00130)
2009			-0.00660***	-0.00346***
			(0.000979)	(0.00133)
2010			-0.0145***	-0.0126***
			(0.000968)	(0.00132)
2011			-0.00946***	-0.0155***
			(0.000962)	(0.00121)
2012			-0.00505***	-0.0179***
			(0.000962)	(0.00123)
Constant	0.121***	0.133***	0.129***	0.136***
	(0.00147)	(0.00266)	(0.00161)	(0.00276)
Observations	798,568	798,568	798,568	798,568
Adjusted R-squared	0.243	0.713	0.243	0.714
Firm-Fixed Effects	NO	YES	NO	YES
Year-Fixed Effects	NO	NO	YES	YES

Robust standard errors in parentheses

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

Table 5: Leverage Determinants Germany

This table presents correlation coefficients between leverage measures and the leverage factors used in the first part of our regression analysis for our German sample. We report the results of all four regression specifications used in this table. Specification one only features the basic set of variables (profitability, tangibility, size and industry median). In specification two firm-fixed effects are added. In specification three we regress leverage on the basic variables as well as on time-fixed effects. Specification four comprises all factors (basic, time- and firm- fixed effects)... Standard errors are reported below the coefficients in brackets. Firm fixed effects are not displayed in the table. Basic variables are defined in the appendix and are lagged by one year. The data was downloaded from Orbis (van Dijk) database.

	Specification 1	Specification 2	Specification 3	Specification 4
Profitability	-0.140***	-0.0680***	-0.142***	-0.0785***
	(0.00418)	(0.00607)	(0.00418)	(0.00611)
Tangibility	0.273***	0.150***	0.273***	0.160***
	(0.00273)	(0.00900)	(0.00273)	(0.00904)
Size	-0.00876***	0.00208	-0.00916***	0.00570***
	(0.000298)	(0.00162)	(0.000301)	(0.00170)
Industry Median	0.414***	0.598***	0.467***	0.479***
	(0.0153)	(0.0332)	(0.0165)	(0.0658)
2005 (base year)			0	0
			(0)	(0)
2006			-0.00605**	-0.0116***
			(0.00285)	(0.00263)
2007			0.0115***	-0.00117
			(0.00297)	(0.00409)
2008			0.0248***	0.00469
			(0.00296)	(0.00388)
2009			0.0130***	-0.0123***
			(0.00280)	(0.00319)
2010			0.00535*	-0.0231***
			(0.00276)	(0.00374)
2011			0.0121***	-0.0248***
			(0.00275)	(0.00405)
2012			0.0217***	-0.0276***
			(0.00289)	(0.00405)
Constant	0.253***	0.0762***	0.240***	0.0515*
	(0.00522)	(0.0264)	(0.00579)	(0.0292)
Observations	125,936	125,936	125,936	125,936
Adjusted R-squared	0.104	0.720	0.106	0.722
Firm-Fixed Effects	NO	YES	NO	YES
Year-Fixed Effects	NO	NO	YES	YES

Robust standard errors in parentheses

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

In line with literature on public limited firms (e.g. Rajan and Zingales, 1995) we find the relationship between tangibility of assets and leverage to be positive and statistically significant at the 1% level for both countries. While the coefficient is 0.160 for the German

sample, the regression on the Swedish data exhibits a coefficient of 0.225. Firms with a low amount of tangible assets usually face difficulties in obtaining debt financing, as they do not have any assets to pledge. In contrast to that, firms with many tangible assets obtain debt financing more easily since they are less risky to lenders (Graham and Leary, 2011), as lenders are not willing to take the risk of lending money without any security (in form of tangible assets). Thus, even if the factor tangibility seems to play a more important role in explaining leverage of Swedish private firms than of German ones this difference can be explained by the sample constitution. As the minimum capital requirements of a Swedish private limited company are lower than of its German counterpart, creditors might be more reluctant to give money to such a firm. Therefore, the effect might be more pronounced once the firm has more collateral to pledge in Sweden. Our results support the trade-off theory, which states that firms try to balance the benefits and costs of leverage against each other. Previous research on public firms has come to similar results (e.g. Lemmon et al., 2009; Frank and Goyal, 2009).

Concerning firm size we find a positive correlation with leverage, as predicted by most of the literature examining public firms. Still the small coefficients indicate that the effect of the variable on leverage is of minor importance in comparison to the other variables. Large firms usually have more stable revenue streams and cash flows than small firms due to the benefits of diversification (Jensen, 1986; Easterbrook, 1984; Drobetz and Wanzenried, 2006). Therefore, large firms face lower bankruptcy risk and are more creditworthy than their small counterparts, as investing in them is deemed to be less risky. The pecking order theory motivates this positive correlation between size and leverage by another explanation. According to this theory external financing is cheaper for larger firms since information asymmetries are lower. Consequently, larger firms can raise a larger amount of debt and benefit from the tax shield. Our findings are in line with previous research on public firms (e.g. Lemmon et al., 2009, and Frank and Goyal, 2009).

According to previous research, leverage depends on the specific industry in which a firm operates. Therefore, we test whether the median leverage of a certain industry in a previous period is related to the leverage prevailing for the individual firms. We find this variable to have a large effect on the leverage of a company's capital structures for the German sample (0.479, significant at the 1% level). Surprisingly there is no significant relationship for the full Swedish sample at hand. This indicates that the influence of competitors in the German

sample is much higher in comparison to Sweden. As the firms in our Swedish sample are small, it might be that their area of operation is not large enough to compete with the other firms in their industry. This phenomenon might make the market become more segregated. In such a market firms are less prone to compete directly with each other or to experience the same supply and demand shocks. Therefore, there is no necessity to adjust the capital structure to the overall average. Still, this result could be an effect of the composition of our sample, as it covers the financial crisis. We find that in pre-crisis and the year of the crisis (2005-2008) the coefficient is significant and shows a negative correlation to leverage. In contrast we find a positive coefficient for the post-crisis years (2009-2012). Due to the sample period the extreme effects of the financial crisis and the post-crisis years might cancel each other out.

As we outline in the methodology part, our model incorporates time- and firm-fixed effects. In the output of results (Table 4 and Table 5) we demonstrate the time-fixed effects. Those capture the macroeconomic changes in our samples. As the year 2005 is serving as a base year the coefficient is equal to zero. All other coefficients measure the changes relative to the base year (Wooldrige, 2008). By comparing this data with the GDP growth of both economies in Figure 1, we can see that the change in the leverage ratio is negatively related to the growth of an economy. This is also in line with the pecking order hypothesis, as firms seem to reduce their exposure to debt financing when the economy is doing well. In contrast to that, during a crisis private firms increase their leverage. Furthermore it is interesting to observe hat the year-fixed effects are not statistically significant during 2008. This might indicate that during a crisis there is no uniform trend across all firms in our sample during this year.

With regard to firm-fixed effects we do not report single variables, due to the large size of the sample. Still we want to direct the reader's attention once more to the drastic increase of the adjusted R-squared, whenever we add this fixed effect to the regression. The models including firm-fixed effects can explain more than 70% of the sample variation. The second best model, however, explains only 24.3% in the case of Sweden and 10.6% in the case of Germany. Therefore, we believe that the individual properties of the companies influence their capital structures substantially. This might be due to the fact that many private companies are not rated on their credit worthiness. Therefore, the loan origination in this market might only be based for a smaller part on a systematic approach, which can be

captured by statistical methods. Instead personal relationships might be the main agents of credibility, which in turn explains the importance of the firm fixed effects.

We run robustness tests on two different dimensions. On the one hand, we run a sector specific regression for both country samples. On the other hand, we divide the samples in two shorter intervals and run the same regression analysis again. Even though nearly all signs of the coefficients in the sector-specific regression are unchanged for the German sample, several industries fail to deliver statistically significant results for size. Especially the primary sector, as well as the manufacturing industry and the construction industry show no significant results for the variable size. Further, the significance level of the results changes only slightly for the variable profitability in some industry sectors. Only for the Tele, Media and IT sector we observe reversed coefficient and no statistically significant result for size as well as no significant results for profitability. However, non-significant findings for the Tele, Media and IT sector may be due to sector specific factors and a small sample size. Overall, the robustness tests deliver excellent results for tangibility and profitability. Therefore, we conclude that our results for profitability and tangibility are robust for Germany. The robustness tests for the Swedish sample show an even better picture. The signs of the coefficients of the subsamples also are congruent with the total sample except for the mining sector. For the mining sector we find no statistically significant results for size. Yet, this finding does not necessarily imply a lack of robustness, as the number of companies, which operate in the mining sector, is very limited. Further, we also divide each sample into two shorter time intervals. For the German sample the signs for the statistically significant coefficients do not change, which indicates robustness. Again, we only find no statistically significant results for size. For the Swedish sample the time-specific robustness tests show the right sign and significance for almost all variables except for industry median. These findings are in line with the full sample OLS regression. Therefore, we conclude that most of our results are robust, which is much better than we expected due to sample constitution and characteristics. A detailed listing of the regression results can be found in the appendix.

5.3. Analysis of the Zero-Leverage Phenomenon

As we find many companies which are not carrying any debt over the entire sample period, we conclude that the zero-leverage phenomenon is also existent in German and Swedish private limited companies. Subsequently we apply the logistic model developed in the methodology to both samples in order to find out what causes an adoption of a zero leverage policy. Results are reported in Table 6. Here we report the effect of a change of one standard deviation in the variables profitability, tangibility, size and the average of firms without debt in the respective year and industry.

We find that German as well as Swedish firms that follow zero-leverage policy are more profitable but smaller, have lower tangible assets. Furthermore the zero-leverage phenomenon seems to be largely influenced by industry characteristics, as the odds for a firm to adopt such a strategy increase in both samples for a change of one standard deviation in the coefficient at the most. Our results are statistically significant at a 1% level.

Our findings are consistent with those of Strabulaev and Yang (2013), who investigate the zero leverage phenomenon of public US firms from 1962 to 2009 and find similar correlations between the respective variables. In the next part we will discuss the implications of the variables and try to find explanations for the behavior of the firms. For our explanations we draw on classical theories of capital structure, as long as they seem to be applicable. Furthermore we compare our results to the recent findings in research on zero leverage firms as well as on private companies. In addition we will state briefly whether we believe that a change in leverage policy is induced by external (willingness of creditors to lend) or internal factors (willingness of the firm to lever up) for each variable.

Table 6: Determinants of a Zero-Leverage policy

In the table below we report the results of our logistic regression for both samples. In this regression we used all firms in the samples independent of their mean leverage over the observed period. We transformed the data to panel data, in order to find out, which factors foster the adoption of a zero leverage policy. Our dependent variable is 1 if a firm does pursue a zero leverage strategy in year t and zero if it is levered. All variables, but Ind. Percentage Zero Leverage are lagged by one year. For completeness we report the odds ratio provided by STATA.

Panel A: Sweden	Coefficients	Odds Ratio Reported
Profitability	0.639***	1.894387***
	(0.00994)	(0.0188249)
Tangibility	-3.330***	0.0358***
	(0.0100)	(0.000358)
Size	-0.108***	0.8974866***
	(0.000915)	(0.0008211)
Ind. Percentage ZL	2.639***	13.99878***
	(0.0171)	(0.2387592)
Constant	0.579***	1.784587
	(0.0162)	(0.0289654)
Pseudo R-Squared	0.1446	
Observations	1,168,103	

Panel B: Germany	Coefficients	Odds Ratio Reported
Profitability	1.411***	4.100557***
	(0.0442)	(0.1810977)
Tangibility	-3.597***	0.0273957***
	(0.0431)	(0.0011801)
Size	-0.119***	0.8873898***
	(0.00340)	(0.0030175)
Ind. Percentage ZL	4.195***	66.33811***
	(0.115)	(7.610803)
Constant	-0.209***	0.811533***
	(0.0638)	(0.0517418)
Pseudo R-Squared	0.1043	
Observations	136,178	

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

As already stated in case of the first regression analysis a firm will decrease leverage as profitability increases. The most extreme case of such a decrease of leverage is to give up leverage altogether and to become unlevered. We could interpret this as an extreme case of pecking-order theory, in which a firm forfeits any sources of outside financing when it can finance its undertakings by means of internally generated revenues. This might be the case especially for private firms as credit markets are hard to access. Brav (2009) describes this situation indirectly, when he mentions the financing disadvantages of private firms. Due to the

so-called level effect, private firms are better off to forfeit leverage as the conditions on credit markets are less favorable. According to pecking order theory, the adoption of a zero leverage policy as a result of an increase of profitability is therefore more likely to be induced by internal factors.

Tangibility according to traditional theories of capital structure however, is improving the chances of being able to borrow from debt markets, as tangible assets represent a source of security to the creditors. This might improve the conditions under which a firm can obtain outside financing. Therefore firms with a sufficiently large portion of tangible assets will be less likely to adopt a zero-leverage strategy, as it can benefit from outside financing. As the asymmetric information about the value of the company decreases the proportion of tangible assets rises, creditors are more likely to give credit to the respective company (Frank and Goyal, 2009). As change in tangibility will alter the perception of the risk tied to a loan given to a company, we conclude that a change of leverage policy is more probable to be related to external environment in this case.

Size is also negatively related to the adoption of a debt free capital structure. This can be explained by similar reasoning as the previous factor. As bigger firms are more diversified and will be more likely to incur stable cash flows, lenders will be more likely to provide the firm with better outside financing options, as the risk of bankruptcy decreases. If financing options are better, they might outweigh the risks of debt and therefore drag firms away from staying unlevered. An independent change of this variable is therefore also tightly linked to the perceptions of creditors of the company. Therefore we believe that an average firm in our sample would abandon its zero leverage policy if conditions by creditors were favorable enough. Therefore we would categorize this effect to be externally influenced as well.

The most influential factor in raising the odds for the adoption of a capital structure is the percentage of non-levered firms in the same industry. From this we can conclude that, the zero-leverage phenomenon is industry specific across our sample data. This means that in an industry, firms are adopting and adjusting their leverage in similar ways, but also behave comparably in the extreme case of zero-leverage strategies. This is in line with Brav (2009), who already emphasizes the importance of industry characeristics in his publication.

Even though all the tested variables are statistically significant for changing the odds of pursuing or adopting a zero-leverage strategy, we find that their impact (and therefore their

explanatory power) is rather small. Also the Pseudo R-squared does not explain much of the variation, even though we want to mention that the explanatory power should be taken with a grain of salt[5]. For both reasons mentioned above we believe, that in the adoption of a zero-leverage approach individual firm characteristics (and not only the four tested variables) matter. These could consist out of endogenous factors like distinct preferences of owners or managers. Furthermore exogenous factors, like the willingness to provide the necessary capital by outside creditors, could depend on the individual features of the company. As private company data has a lower explanatory power and is less available compared to information on public firms, this might make creditors use other variables, which cannot be captured by a regression model.

We run a sector specific regression for both country samples in order to test the robustness of our results. Most signs of the coefficients in the sector-specific regression are unchanged for the Swedish sample. Only two industries, Agriculture and Transportation, show the wrong sign for profitability. Yet, this finding does not necessarily imply a lack of robustness, as the number of companies, which operate in the agricultural sector, is very limited. In addition, the transportation business is a very capital intensive business. Therefore, firms that operate in this industry have high amount of leverage no matter if they are profitable or not. Further, we find no significant results for the variables profitability and size for mining. Again, this finding are due to industry characteristics (capital intensity), and does not necessarily imply a lack of robustness. The results of the sector specific robustness test for Germany show a similar picture. All signs of the coefficients in the sector-specific regression are unchanged. However, some variables show non-significant results. With regards to profitability the coefficients for Agriculture and Mining are not significant and with regards to size the coefficients for Mining, Manufacturing and Accommodation & Food are not significant. However, the variable tangibility shows robust results for both countries. We conclude that even though our robustness tests do not yield perfect results, they are still much better than expected.

[5] The Pseudo R-Squared reported by Stata is due to the non-linear properties of the logistic regression not comparable to an R-Squared in a linear regression. We use it here rather as an approximate indication, instead of pinning it down to its exact number.

6. Conclusion

Setting out with a sample of private firm data of Sweden and Germany, we attempt to shed light on the question, whether private firms manage their capital structures in a similar way as their public peers. The sample, which consists of industrial companies and comprises observation from 2004 to 2012, is analyzed by using three different procedures. First, we analyze the sample on its properties by using a descriptive method in order to find out whether firms adjust their capital structure and if there are still distinguishable differences between the groups. Subsequently we apply two different regression models to the firms, in order to find out how firms capital structure decision are influenced. Furthermore we use a logit regression in order to find out, what factors make the adoption of a zero leverage policy more likely.

Despite the differences between private and public limited companies, we find our samples of non-listed German and Swedish industrial companies to behave very similar to their public peers. In the descriptive part, we are able to show that private firms adjust their capital structure in the long run. Still, we are able to distinguish our different leverage preferences clearly from one another. This is in line with the results obtained by Lemmon et al. (2008). Therefore, we can state that private firms do manage their capital structure and adjust their leverage in a similar manner as publicly traded firms in the long run. Dependent on firm characteristics several kinds of preferences seem to prevail, even though a converging trend can be observed. In the empirical part of our research, we find that the decisions of private limited companies in Germany and Sweden can be explained by the same variables as in case of their public peers. While profitability is related to a decrease, size and tangibility exert a positive effect on leverage for both our samples. Merely the industry median is significant in our German sample only. The insignificance of the median industry leverage for our Swedish sample is puzzling, but can be explained by the characteristics of the market or the difficult economic times. Once more we like to stress the large explanatory power of individual firm characteristics, which is captured in the firm-fixed effects. These effects seem to play a larger role in the case of our sample compared to the research on publicly traded firm. As many of the private firms are not rated on their credit worthiness and less information is available, we believe that in the private sector the personal relationships between creditors and firms are more important than the crude numbers in a company's books. In our attempt to examine the

zero-leverage phenomenon amongst private limited companies we find that compared to research done on public companies so far, the percentage of non-levered companies is relatively large. Especially in our Swedish sample this phenomenon is distinct. This might be due to the fact that some private companies do not have access to debt market due to a lack in creditworthiness. This argument would be in line with Brav (2009). Alternatively one could explain this behavior by the unsatisfying benefits debt has for those companies. If the individual benefits of debt are small, firms will decide to forego leverage, as they do not get compensated enough for the risk they are taking on. We find unlevered firms tend to be smaller, more profitable and to possess fewer tangible assets. Furthermore we find that the decision to stay unlevered is tied to the industry sector a firm belongs to. Still the factors mentioned above cannot explain, when a firm is deciding to stay unlevered. As we have already outlined in the previous section, those factors could possibly be related to exogenic and endogenic factors, in order to determine, whether a firm is willingly not levering up or whether it cannot find any outside debt financing. This would be an interesting topic for further research.

We believe that our work contributes to the understanding of the capital structure of private limited companies, which until now have been neglected by most researchers. This might be due to the difficulties in deriving firm data. In our case we have been able to extract a firm sample of company data of the last decade. Even though our time frame is limited, the range of the sample is large. We believe that future research could add to the topic by examining data over a longer period of time. Research could also expand geographically in order to answer the question, whether the factors tested by us are reliable indicators for private firm capital structures around the globe or whether individual local factors can explain the changes in capital structure. As in Sweden and Germany private companies have weathered the economic crisis very well in comparision to their peers in other European economies, we believe that understanding the decision making of creditors and entrepreneurs in the countries of our research and comparing it to countries, which suffered more from the financial crisis, is an important topic for future research. This could help to improve the understanding of private limited firms and help to enhance the capital structure of those companies in weaker economies. However, we are confident that our analysis contributes to this field of research as one more piece in the puzzle of private firms' decision making on their capital structure.

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Appendix

Table 7: Industry Classification:

In the table below we report the schema in which we grouped the retrieved data into industry specific subsamples. The data retrieved from the Orbis (van Dijk) database, allots a standardized to most companies in the database. As the NACE Rev. 2 classification is very detailed we merge companies from similar backgrounds into wider industry classification groups. Firms which do not carry a specific NACE Rev. 2 code are grouped into a separate group. We include those in the testing of the whole sample, but dismiss them for industry specific robustness-tests.

Industry Classification	Range of NACE Rev. 2 Codes
Agriculture	100 - 399
Mining	500 - 999
Manufacturing	1000-3399
Energy (dismissed)	3500 -3900
Construction	4100 - 4399
Retail & Wholesale	4500- 4799
Transportation	4900 - 5399
Accommodation & Food	5500 - 5699
Tele, Media & IT	5800 - 6399
Other services	6400 – 9799
No classification	.

Table 8: Definition of Variables

In the table below we report the definition of the variables used in our regression analysis. The industry median is only used in case of the OLS regression. The variable Zero Leverage Firms in industry replaces the industry median in the logistic regression.

Variable	Definition
Book Leverage	(long-term debt + loans)/total assets
Size	ln(sales+1)
Tangibility	tangible fixed assets/ total assets
Profitability	EBITDA/ total assets
Industry Median	median leverage of industry sector
Zero Leverage Firms in Industry	percentage of firms with zero leverage in the same industry

Figure 4: Robustness-Test: Leverage Over Time Depending on Initial Size

The figure below presents the results of our robustness-test on the relationship between the initial size of a company and its leverage policy. In a similar procedure as in the original test we sort the firms in our sample, which are reporting in 2004, according to their initial size (measured by sales in 2004). We then compile for each group and year the average leverage and combine the average leverages of each group in order to show their development over time. Panels A and C report the results for all firms reporting in 2004 of the respective country sample. Panels B and D report the respective averages for survivor firms, which are reporting in all sample periods. As the trend of the original statistics is not mirrored we conclude that there is no relationship between size and leverage.

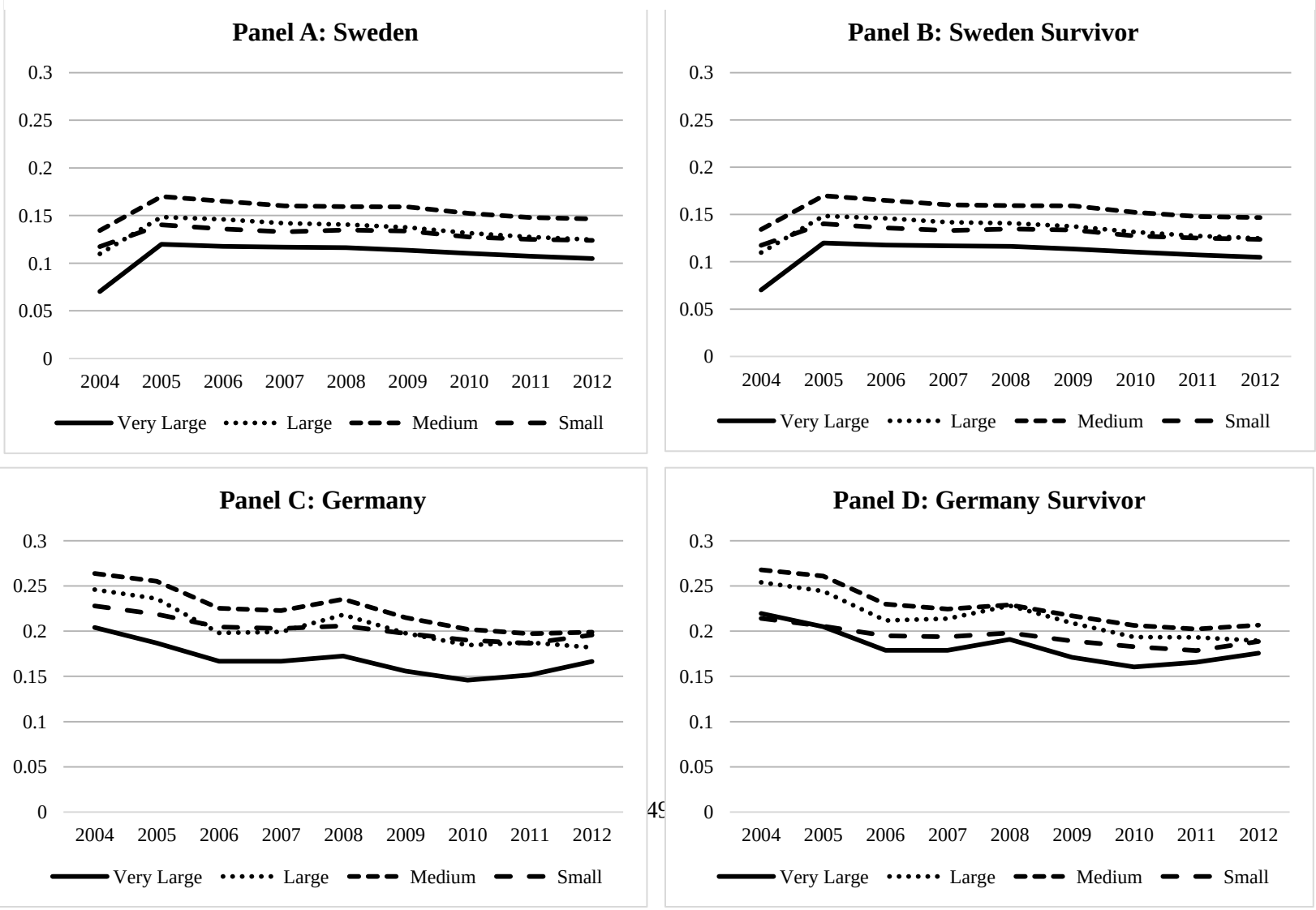
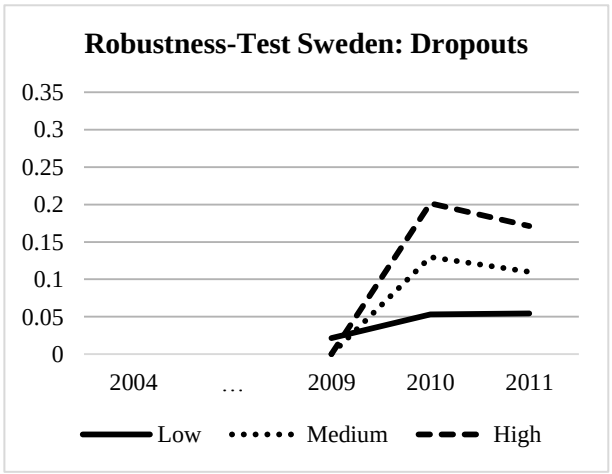


Figure 5: Robustness-Tests Dropouts

In the figures below we report the results of our robustness –tests on firms, which are leaving the sample early. As in the original descriptive test, we first allotted all firms reporting in 2004 into 4 different groups according to their leverage ratios in the initial period. In the case of the Swedish sample, we merged the lowest two quartiles into one as the percentage of firms without leverage was larger than 25%. Different from the original test, we only include a firm year observation of leverage in the yearly average, if a firm a firm stops reporting in the next year. Results are inconclusive as the first exit occurs for both samples as late as in 2009. Furthermore few firms leave the sample before 2011(about 2.6% in each sample).



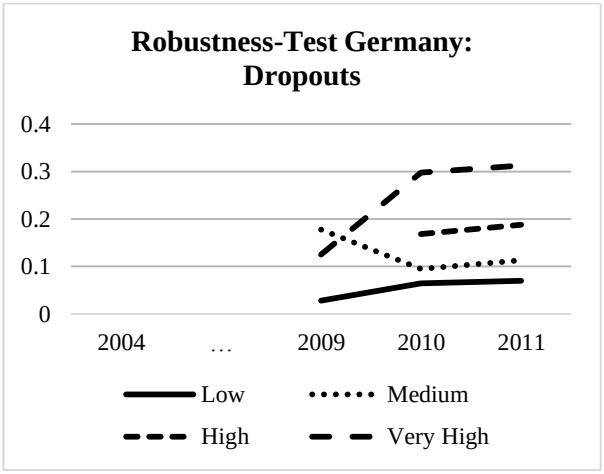


Table 9: Variance Inflation Factors OLS-Regression

In the table below we report the respective variance inflation factors for both samples. Panel A presents the values obtained for our German sample. The variance inflation factors for our Swedish sample are listed in Panel B. As none of the values exceeds the benchmark of 5, we conclude that our sample is free from multicollinearity.

Panel A: Germany	Profitability	Tangibility	Size	Industry Median
R-squared	0,003	0,013	0,008	0,011
Variance Inflation Factor	1,003	1,013	1,008	1,011

Panel B: Sweden	Profitability	Tangibility	Size	Industry Median
R-squared	0,051	0,091	0,057	0,097
Variance Inflation Factor	1,054	1,100	1,060	1,107

Table 10: Robustness Test Sweden Periods 2005 – 2008 and 2009 – 2012

This table presents correlation coefficients between leverage measures and the leverage factors used in the first part of our regression analysis for our Swedish sample. We report the results for the time from 2004-2008 on the left. The results of the second period (2009-2012) are reported on the right. Standard errors are reported below the coefficients in brackets. Firm fixed effects are not displayed in the table. Basic variables are defined in the Appendix and are lagged by one year.

Sweden 2005 - 2008		**Sweden 2009-2012**	
Profitability	-0.0488***	Profitability	-0.0422***
	(0.00155)		(0.00124)
Tangibility	0.120***	Tangibility	0.122***
	(0.00233)		(0.00212)
Size	0.00161***	Size	0.00133***
	(0.000271)		(0.000189)
Industry Median	-0.0458***	Industry Median	0.382***
	(0.0110)		(0.0423)
2005 (base year)	0	2009 (base year)	0
	(0)		(0)
2006	-0.00248***	2010	-0.00843***
	(0.000692)		(0.000477)
2007	-0.00602***	2011	-0.0111***
	(0.000678)		(0.000559)
2008	-0.00519***	2012	-0.0136***
	(0.000667)		(0.000629)
Constant	0.169***	Constant	0.158***
	(0.00346)		(0.00308)
Observations	359,606	Observations	438,962
Adjusted R-squared	0.763	Adjusted R-squared	0.794

Standard errors in parentheses

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

Table 11: Robustness Test Germany for Periods 2004 – 2008 and 2009 - 2012

This table presents correlation coefficients between leverage measures and the leverage factors used in the first part of our regression analysis for our German sample. We report the results for the time from 2004-2008 on the left. The results of the second period (2009-2012) are reported on the right. Standard errors are reported below the coefficients in brackets. Firm fixed effects are not displayed in the table. Basic variables are defined in the Appendix and are lagged by one year.

Germany 2005 - 2008		**Germany 2009-2012**	
Profitability	-0.0463***	Profitability	-0.0498***
	(0.00962)		(0.00651)
Tangibility	0.0856***	Tangibility	0.0977***
	(0.0130)		(0.00956)
Size	0.0107***	Size	0.00176
	(0.00222)		(0.00176)
Industry Median	0.476***	Industry Median	0.613***
	(0.0874)		(0.0946)
2005 (base year)	0	2009 (base year)	0
	(0)		(0)
2006	-0.0121***	2010	-0.0110***
	(0.00284)		(0.00186)
2007	-0.00249	2011	-0.0128***
	(0.00558)		(0.00239)
2008	-0.000852	2012	-0.0157***
	(0.00511)		(0.00234)
Constant	-0.00464	Constant	0.129***
	(0.0373)		(0.0301)
Observations	52,579	Observations	73,357
Adjusted R-squared	0.737	Adjusted R-squared	0.777

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table 12: Robustness-Test Sweden by Industry 1

The table below reports the first part of the robustness checks, in which we split the sample by industry groups. As in the original dataset the data was downloaded from Orbis (Van Dijk). The data comprises firm observations from 2004-2012. The results are robust for the majority of industry groups. The insignificant results, which occur are attributed to the sample size.

Panel A	Agriculture	Mining	Manufacturing
Profitability	-0.123***	-0.0562**	-0.0942***
	(0.00676)	(0.0263)	(0.00298)
Tangibility	0.210***	0.224***	0.257***
	(0.00658)	(0.0274)	(0.00389)
Size	0.0152***	0.00388	0.00692***
	(0.00146)	(0.00553)	(0.000819)
2005 (base year)	0	0	0
	(0)	(0)	(0)
2006	0.00383	0.00243	-0.00788***
	(0.00306)	(0.0126)	(0.00158)
2007	-0.00354	-0.0180	-0.0111***
	(0.00304)	(0.0125)	(0.00157)
2008	-0.00439	-0.0265**	-0.00920***
	(0.00303)	(0.0124)	(0.00157)
2009	-0.000780	-0.0287**	-0.00482***
	(0.00300)	(0.0124)	(0.00156)
2010	-0.00956***	-0.0233*	-0.0179***
	(0.00300)	(0.0122)	(0.00156)
2011	-0.00911***	-0.0389***	-0.0207***
	(0.00301)	(0.0124)	(0.00157)
2012	-0.0147***	-0.0361***	-0.0223***
	(0.00304)	(0.0126)	(0.00159)
Constant	0.0600***	0.133*	0.0702***
	(0.0181)	(0.0714)	(0.0109)
Observations	32,748	1,581	96,447
R-Squared	0.786	0.776	0.765
Adjusted R-Squared	0.746	0.732	0.721

Standard errors in parentheses

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

Table 13: Robustness-Test Sweden by Industry 2

The table below reports the second part of the robustness checks, in which we split the sample by industry groups. As in the original dataset the data was downloaded from Orbis (Van Dijk). The data comprises firm observations from 2004-2012. The results are robust for the majority of industry groups. The insignificant results, which occur are attributed to the sample size.

	Construction	Retail& Wholesale	Transportation
Profitability	-0.0523***	-0.0882***	-0.0822***
	(0.00252)	(0.00225)	(0.00489)
Tangibility	0.233***	0.254***	0.217***
	(0.00329)	(0.00330)	(0.00446)
Size	0.00639***	0.00576***	0.0131***
	(0.000705)	(0.000552)	(0.00125)
2005 (base year)	0	0	0
	(0)	(0)	(0)
2006	-0.00193	-0.00419***	-0.00457*
	(0.00155)	(0.00122)	(0.00239)
2007	-0.00368**	-0.00562***	-0.00880***
	(0.00154)	(0.00121)	(0.00238)
2008	-0.000162	-0.00130	-0.0120***
	(0.00153)	(0.00121)	(0.00237)
2009	-0.00328**	-0.00578***	-0.0132***
	(0.00151)	(0.00120)	(0.00234)
2010	-0.00948***	-0.0157***	-0.0292***
	(0.00150)	(0.00120)	(0.00233)
2011	-0.0126***	-0.0173***	-0.0354***
	(0.00151)	(0.00121)	(0.00236)
2012	-0.00965***	-0.0191***	-0.0424***
	(0.00153)	(0.00123)	(0.00240)
Constant	0.0529***	0.103***	0.0674***
	(0.00895)	(0.00738)	(0.0158)
Observations	110,636	179,693	61,126
R-Squared	0.768	0.761	0.743
Adjusted R-Squared	0.718	0.711	0.692

Standard errors in parentheses

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

Table 14: Robustness-Test Sweden by Industry 3

The table below reports the third part of the robustness checks, in which we split the sample by industry groups. As in the original dataset the data was downloaded from Orbis (Van Dijk). The data comprises firm observations from 2004-2012. The results are robust for the majority of industry groups. The insignificant results, which occur are attributed to the sample size.

	Accommodation & Food	Tele, Media & IT	Other Services
Profitability	-0.0686***	-0.0508***	-0.0534***
	(0.00511)	(0.00389)	(0.00175)
Tangibility	0.228***	0.188***	0.210***
	(0.00638)	(0.00727)	(0.00264)
Size	0.00456***	0.00358***	0.00276***
	(0.00158)	(0.00108)	(0.000468)
2005 (base year)	0	0	0
	(0)	(0)	(0)
2006	0.000100	-0.00602*	7.27e-05
	(0.00375)	(0.00312)	(0.00126)
2007	-0.00417	-0.00544*	-0.000126
	(0.00371)	(0.00310)	(0.00125)
2008	-0.00412	-0.00416	0.00208*
	(0.00368)	(0.00308)	(0.00124)
2009	-0.0127***	-0.00373	-0.00211*
	(0.00364)	(0.00306)	(0.00123)
2010	-0.0243***	-0.00767**	-0.00701***
	(0.00361)	(0.00307)	(0.00123)
2011	-0.0384***	-0.00992***	-0.00964***
	(0.00362)	(0.00311)	(0.00124)
2012	-0.0491***	-0.00962***	-0.0131***
	(0.00368)	(0.00316)	(0.00127)
Constant	0.146***	0.0784***	0.104***
	(0.0201)	(0.0133)	(0.00574)
Observations	31,206	32,178	206,244
R-Squared	0.793	0.695	0.747
Adjusted R-Squared	0.739	0.627	0.690

Standard errors in parentheses

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

Table 15: Robustness-Test Germany by Industry 1

The table below reports the first part of the robustness checks, in which we split the sample by industry groups. As in the original dataset the data was downloaded from Orbis (Van Dijk). The data comprises firm observations from 2004-2012. The results are robust for the majority of industry groups. The insignificant results, which occur are attributed to the sample size.

	Agriculture	Mining	Manufacturing
Profitability	-0.143*	-0.154**	-0.108***
	(0.0782)	(0.0778)	(0.00935)
Tangibility	0.212**	0.201**	0.177***
	(0.0821)	(0.0881)	(0.0117)
Size	0.0202	-0.0205	0.00359
	(0.0167)	(0.0267)	(0.00259)
2005 (base year)	0	0	0
	(0)	(0)	(0)
2006	-0.0296	-0.00413	-0.0231***
	(0.0243)	(0.0276)	(0.00347)
2007	-0.0534**	-0.0145	-0.0232***
	(0.0267)	(0.0291)	(0.00367)
2008	-0.0590**	-0.0134	-0.0150***
	(0.0283)	(0.0287)	(0.00373)
2009	-0.0565**	-0.0351	-0.0229***
	(0.0279)	(0.0286)	(0.00369)
2010	-0.0979***	-0.0599**	-0.0440***
	(0.0273)	(0.0281)	(0.00363)
2011	-0.0851***	-0.0490*	-0.0527***
	(0.0271)	(0.0288)	(0.00367)
2012	-0.0624**	-0.0267	-0.0557***
	(0.0291)	(0.0315)	(0.00400)
Constant	0.0235	0.524	0.181***
	(0.236)	(0.419)	(0.0411)
Observations	801	391	31,096
R-Squared	0.862	0.876	0.816
Adjusted R-Squared	0.746	0.797	0.714

Standard errors in parentheses

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

Table 16: Robustness-Test Germany by Industry 2

The table below reports the second part of the robustness checks, in which we split the sample by industry groups. As in the original dataset the data was downloaded from Orbis (Van Dijk). The data comprises firm observations from 2004-2012. The results are robust for the majority of industry groups. The insignificant results, which occur are attributed to the sample size.

	Construction	Retail& Wholesale	Transportation
Profitability	-0.0740***	-0.111***	-0.0158
	(0.0151)	(0.0116)	(0.0218)
Tangibility	0.128***	0.156***	0.259***
	(0.0189)	(0.0167)	(0.0193)
Size	0.00433	0.0105***	0.0103**
	(0.00313)	(0.00270)	(0.00484)
2005 (base year)	0	0	0
	(0)	(0)	(0)
2006	-0.0229***	-0.0288***	-0.0168**
	(0.00550)	(0.00405)	(0.00728)
2007	-0.0103*	-0.0357***	-0.0372***
	(0.00613)	(0.00436)	(0.00780)
2008	0.0218***	-0.0342***	-0.0237***
	(0.00628)	(0.00447)	(0.00787)
2009	-0.00450	-0.0456***	-0.0358***
	(0.00607)	(0.00439)	(0.00782)
2010	-0.0418***	-0.0611***	-0.0353***
	(0.00601)	(0.00435)	(0.00774)
2011	-0.0458***	-0.0657***	-0.0272***
	(0.00607)	(0.00442)	(0.00786)
2012	-0.0524***	-0.0644***	-0.0338***
	(0.00646)	(0.00474)	(0.00861)
Constant	0.168***	0.115***	0.0517
	(0.0448)	(0.0419)	(0.0745)
Observations	17,385	29,524	6,757
R-Squared	0.780	0.833	0.869
Adjusted R-Squared	0.615	0.721	0.788

Standard errors in parentheses

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

Table 17: Robustness-Test Germany by Industry 3

The table below reports the third part of the robustness checks, in which we split the sample by industry groups. As in the original dataset the data was downloaded from Orbis (Van Dijk). The data comprises firm observations from 2004-2012. The results are robust for the majority of industry groups. The insignificant results, which occur are attributed to the sample size.

	Accommodation & Food	Tele, Media & IT	Other Services
Profitability	-0.133**	-0.00880	-0.0510***
	(0.0524)	(0.0213)	(0.00876)
Tangibility	0.108	0.216***	0.124***
	(0.0664)	(0.0354)	(0.0107)
Size	0.0340*	-0.00222	0.00566***
	(0.0188)	(0.00616)	(0.00190)
2005 (base year)	0	0	0
	(0)	(0)	(0)
2006	0.00388	-0.0188*	-0.0180***
	(0.0275)	(0.00987)	(0.00333)
2007	0.00105	-0.0282**	-0.0231***
	(0.0308)	(0.0110)	(0.00352)
2008	-0.0295	-0.0281**	-0.0176***
	(0.0310)	(0.0113)	(0.00356)
2009	-0.0279	-0.0480***	-0.0219***
	(0.0311)	(0.0109)	(0.00352)
2010	-0.0367	-0.0462***	-0.0348***
	(0.0313)	(0.0108)	(0.00351)
2011	-0.0598*	-0.0456***	-0.0378***
	(0.0315)	(0.0111)	(0.00354)
2012	-0.0578*	-0.0455***	-0.0351***
	(0.0340)	(0.0122)	(0.00395)
Constant	-0.244	0.197**	0.125***
	(0.272)	(0.0904)	(0.0294)
Observations	1,132	4,689	34,160
R-Squared	0.860	0.765	0.852
Adjusted R-Squared	0.712	0.587	0.762

Standard errors in parentheses

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

Table 18: Sweden: Robustness- Tests Logistic-Regression

In the table underneath we report the results of the robustness-test conducted by industry group for our logistic regression for our German sample. As in the original test we regress the variables in the first column against our leverage dummy (1=no leverage, 0=leverage). Values below zero indicate that the determinant has a negative effect on leverage. Positive determinants indicate that an increase in the factor will make the event (no leverage) more likely. As for the original sample all data has been downloaded from Orbis (van Dijk) and comprises observations of private limited companies between 2004 and 2012.

	Agiculture	Mining	Manufacturing	Construction	R&W	Transportation	A&F	Tele, Media &IT	other Services
Profitability	-0.537***	0.235	0.842***	0.718***	1.016***	-0.539***	0.237***	0.585***	0.544***
	(0.0759)	(0.312)	(0.0341)	(0.0308)	(0.0235)	(0.0573)	(0.0476)	(0.0345)	(0.0156)
Tangibility	-3.489***	-4.397***	-3.468***	-4.443***	-2.845***	-4.726***	-3.172***	-2.899***	-3.474***
	(0.0519)	(0.256)	(0.0320)	(0.0302)	(0.0255)	(0.0409)	(0.0412)	(0.0461)	(0.0173)
Size	-0.156***	-0.0139	-0.0829***	-0.162***	-0.0868***	-0.0850***	-0.0278***	-0.0778***	-0.101***
	(0.00631)	(0.0196)	(0.00270)	(0.00350)	(0.00189)	(0.00483)	(0.00549)	(0.00347)	(0.00155)
Constant	2.219***	0.955***	1.398***	2.735***	1.238***	1.968***	1.089***	2.218***	2.329***
	(0.0765)	(0.236)	(0.0357)	(0.0455)	(0.0251)	(0.0635)	(0.0701)	(0.0425)	(0.0186)
Observations	39,882	2,055	127,534	156,135	250,680	72,345	41,963	72,811	396,329
Pseudo R-Squared	0.1596	0.1668	0.0938	0.1503	0.0511	0.2360	0.1314	0.0562	0.1089

Standard errors in parentheses

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

Table 19: Germany: Robustness- Tests Logistic-Regression

In the table underneath we report the results of the robustness-test conducted by industry group for our logistic regression for our German sample. As in the original test we regress the variables in the first column against our leverage dummy (1=no leverage, 0=leverage). Values below zero indicate that the determinant has a negative effect on leverage. Positive determinants indicate that an increase in the factor will make the event (no leverage) more likely. As for the original sample all data has been downloaded from Orbis (van Dijk) and comprises observations of private limited companies between 2004 and 2012.

	Agiculture	Mining	Manufacturing	Construction	R&W	Transportation	A&F	Tele, Media &IT	other Services
Profitability	1.291	1.243	1.827***	2.152***	2.083***	1.012***	0.624**	0.974***	0.908***
	(0.839)	(0.907)	(0.108)	(0.149)	(0.0982)	(0.205)	(0.303)	(0.151)	(0.0716)
Tangibility	-3.173***	-4.242***	-3.389***	-4.437***	-4.244***	-4.821***	-2.786***	-2.658***	-3.665***
	(0.514)	(0.676)	(0.0955)	(0.184)	(0.118)	(0.162)	(0.283)	(0.202)	(0.0676)
Size	-0.572***	-0.0851	-0.0127	-0.260***	-0.0819***	-0.0571***	-0.0549	-0.0846***	-0.205***
	(0.0824)	(0.0584)	(0.00801)	(0.0154)	(0.00705)	(0.0187)	(0.0376)	(0.0142)	(0.00580)
Constant	6.911***	1.005	-0.978***	2.352***	0.305***	0.661**	0.675	0.851***	2.655***
	(1.134)	(1.018)	(0.132)	(0.222)	(0.113)	(0.295)	(0.571)	(0.214)	(0.0857)
Observations	828	416	32,721	18,178	32,043	7,254	1,305	5,420	38,012
Pseudo R-Squared	0.1890	0.1292	0.0600	0.0792	0.0629	0.1933	0.0787	0.0388	0.1709

Standard errors in parentheses

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