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„How fast do self-interested managers adjust the firm´s capital structure?“

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Abbreviations

API	Application Programming Interface
BeNeLux	Belgium, the Netherlands, and Luxembourg
R&D	Research and Development

1 Introduction and Research Question:

Research about a firm´s capital structure dates back to Modigliani and Miller (1958) at the least. The static trade-off theory of capital structure (Baxter, 1967; Kraus and Litzenberger, 1973) suggests an optimal capital structure which balances the advantages as well as disadvantages of debt. With increasing debt, the present value of the tax shield as well as the bankruptcy costs increases. The optimal debt ratio weighs benefits of the tax shield with disadvantages of the increasing bankruptcy risk in order for the firm to develop to the maximum. This leads to the conclusion that firms have a target capital structure. A deviation from the target capital structure should be adjusted immediately. In reality, leverage ratios fluctuate exceedingly and only few companies are able to maintain a debt-to-assets ratio consistently (DeAngelo and Roll, 2015).

The dynamic trade-off theory takes transaction costs into consideration and implies that a firm adjusts their capital structure, once the costs of deviation from the target capital structure exceeds said transaction costs (Fischer et al., 1989). Although it is worth mentioning that transaction costs demonstrate the deviation from the target capital structure merely partly. Additional factors that affect the adjustment speed towards the target capital structure are agency costs (Morellec et al., 2012). Debt, especially short-term debt, has a disciplinary effect on the management and therefore reduces agency costs (Diamond, 1991; Jensen, 1986; Kochhar, 1996). In the presence of a takeover risk, managers need to increase leverage, in order to maintain their jobs (Berger et al., 1997). Self-interested managers could adjust the capital structure differently than what is optimal for the shareholders, in terms of leverage and debt maturity. Such a difference in adjustment speed may result in costs for said shareholders, as a result of a non-optimal capital structure. Not only the leverage ratio is subject to the agency problem, but managers also have an incentive to prolong the debt maturity to avoid the disciplinary effect of short term debt.

Despite the fact that the capital structure research dates considerably far back, the capital´s structure´s adjustment speed was only discussed in few papers. To estimate capital structure adjustment speed, many papers used a dynamic partial adjustment model (Daskalakis et al., 2017; McMillan and Camara, 2012; Öztekin and Flannery, 2012). The findings of these papers reveal that capital structure adjustment speed is determined by a variety of factors, such as firm size, economic cycle and legal environment (Daskalakis et al., 2017; McMillan and Camara, 2012; Öztekin and Flannery, 2012).

This thesis shall discuss the question how self-interested managers adjust the firm´s capital structure and debt maturity, in order to enhance the understanding of the agency problem between managers and shareholders. Based on the approach of Chang et al. (2014) a dynamic partial adjustment model is applied to estimate the adjustment speed. Following Chang et al. the dataset gets divided in overleveraged and underleveraged firms to observe how self-interested managers adjust the capital structure respectively. Using the same approach to examine the debt maturity, the dataset gets divided in firms with an excessively long and excessively short debt maturity, in order to see how self-interested managers adjust in the different states. This research approach´s purpose is to bring further evidence on how self-interested managers exploit insufficient governance mechanisms for their own benefit.

2 Literature Review

In order to fund a company's operations, managers face the choice of the right mix between debt and equity and the choice of the debt maturity. Asai (2020, p. 4) describes capital structure as following "In the simplest form of capital structure theory, a firm is a mere machine that generates cash flows automatically. Then, a firm's capital structure choice is a mere choice of how to divide up cash flows across claim holders."

In the dynamic trade-off theory developed by Fischer et al. (1989), firms have a target capital structure to balance out the advantages and disadvantages of debt. On the one hand debt increases firm value through the tax shield, on the other hand, debt increases the risk for the shareholders because interest expenses are fixed costs and the firm may go bankrupt. In the presence of adjustment costs, firms adjust their capital structure to the target once the costs of a suboptimal capital structure exceed the adjustment costs. Even small recapitalization costs lead to wide swings in a firm's debt ratio over time (Fischer et al., 1989).

In contradiction the theory that firms rebalance the capital structure, Welch (2004) came to the result that stock returns may explain 40% of the market-debt ratio dynamics, over a 1-to-5-year horizon. The study indicates, that even if the net-issuing activities can explain 60% of the debt-ratio dynamics, the firm´s motives are unclear and therefore it cannot be concluded that firms have a target debt ratio.

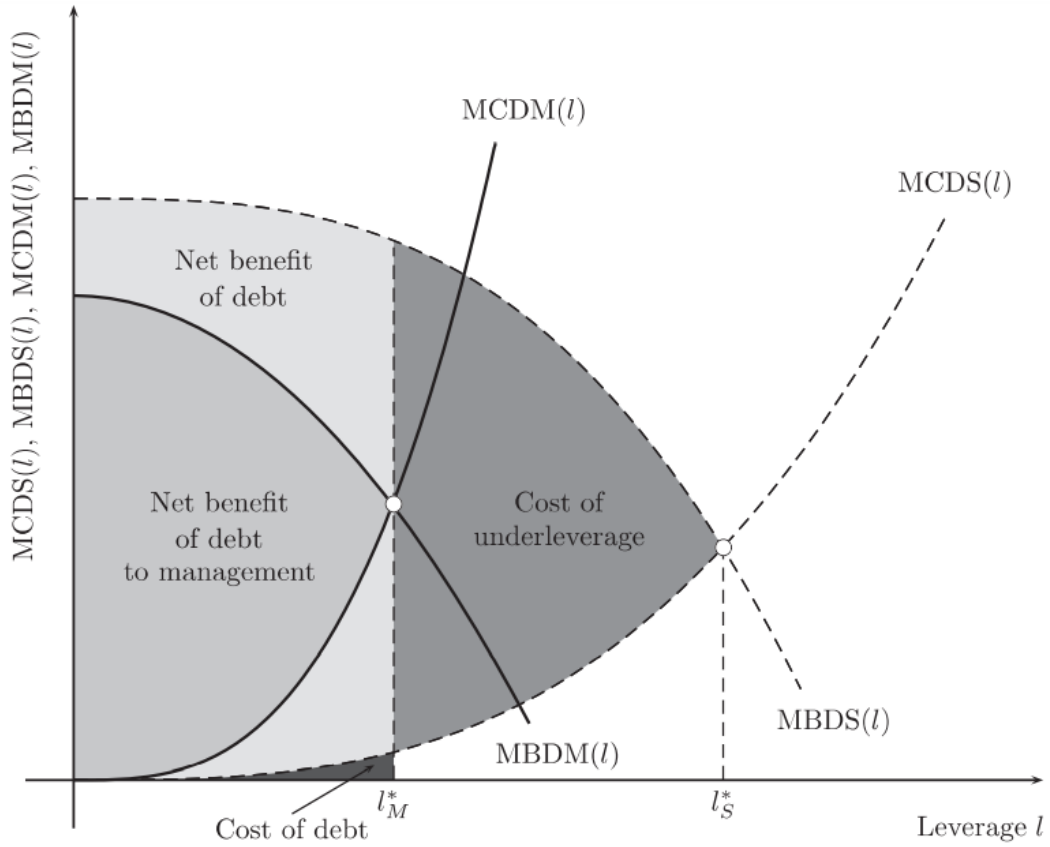
Inspired by Fischer et al., Leary and Roberts (2005) researched if firms adjust their capital structure. They come to the conclusion that adjustment costs can help to explain why firms do not instantly adjust their capital structure but instead strive towards a target capital structure over the next years. They use simulated data from a dynamic trade-off model and obtain similar qualitative and quantitative results than Welch (2004). Therefore, Leary and Roberts conclude that Welch´s model cannot distinguish between alternative theories and that the persistent effect

of capital structure shocks is more likely due to the presence of adjustment costs than indifference toward capital structure.

Beside adjustment costs also a conflict of interests between managers and shareholders helps to explain why firms deviate from their target leverage ratio (Morellec et al., 2012). Agency problems between managers and shareholders have been described in previous work. Managers have an incentive to grow the firm beyond the optimal size because it increases the resources under control of the manager and therefore the manager's power (Jensen and Meckling, 1976). Further a larger firm is associated with a higher compensation for the manager and the costs of an inefficient allocation of resources as a result of a conflict of interests between managers and investors are called agency costs The costs of an inefficient allocation of resources as a result of a conflict of interests are called agency costs (Jensen and Meckling, 1976).

Jensen (1986) argues that managers of firms with essential free cashflows can payout dividends or act in their own interest by making low-return investments. According to his research, firms with higher free-cash flow have a larger conflict of interests and debt obligations lower the free-cashflow under manager's control. Debt may reduce the agency cost through debtholders bringing the firm to court in the case of bankruptcy (Jensen, 1986).

The hypothesis of disciplinary effect of debt goes at least back to Grossman and Hart (1982). Grossman and Hart´s model assumes that a managers can only lose their jobs if the firm goes bankrupt. If the firm is all equity financed the firm cannot go bankrupt. If the firm is also financed by debt and cannot pay-back its debt obligations, the firm goes bankrupt. The study's results indicate that debt increases the manager´s incentive to work, in order to not lose the job. Jiraporn and Liu (2008) brings further evidence for the disciplinary effect of debt through their result that firms with staggered boards are significantly less leveraged. They reason the results such that staggered boards can entrench inefficient managers and therefore motivate the manager to adopt a lower level of debt to avoid its disciplinary effect.



(Morellec et al. 2012, p. 825)

Figure 1. Cost of debt and underleverage. The figure plots the marginal benefit of debt, MBDM(l) and MBDS(l), as a function of leverage l from the perspective of managers and shareholders, respectively. The figure also depicts the optimal leverage ratio (where marginal costs and benefits of debt are equalized) from the perspective of managers and shareholders, denoted by l^*_M and l^*_S.

The agency conflict between managers and shareholders about the optimal leverage is illustrated in Figure 1. The benefits of debt from a shareholder perspective, include the tax savings and the disciplinary effect. The costs of debt include the bankruptcy costs and the issuing costs. The intersection l^*_S is the optimal leverage level according to the tradeoff theory, where the marginal cost and benefits of debt are balanced out. The costs, from a managers perspective include the disciplinary effect of debt. Managers have an incentive to adopt a lower leverage level l^*_M to lower the risk of losing their job in the case of a bankruptcy. The costs of underleverage for the shareholders, is the area between MBDS(l) and MCDS(l) between the points l^*_M and l^*_S (Morellec et al., 2012).

If CEOs do not have an incentive to maximize value either from ownership and compensation incentives or active monitoring, the debt level of the firm is significantly lower (Berger et al., 1997).

Beside the disciplinary effect of debt there exists a disciplinary effect by the takeover risk from other firms. If the firm is run poorly, a raider may buy the firm at a low price, reorganize it, and sell it at a higher price (Grossman and Hart, 1982).

Managers may also find it optimal to increase leverage if there is a serious takeover risk. To avoid losing their job, it is in the managers best interest to choose a higher than optimal leverage ratio to defend against a takeover (Berger et al., 1997).

Another characteristic of the capital structure is the debt maturity. As shorter the maturity of a debt obligation, as earlier the debt must be repaid. Similar to firm´s optimal leverage ratio, there exists an optimal debt maturity. From a shareholder perspective, short term debt has the benefit of disciplining the management but the disadvantage of increasing default risk, which eliminates future investment opportunities (Diamond and He, 2014).

A shorter debt maturity may soften the interest conflict between shareholders and managers because of frequent renegotiation and monitoring from banks, managers must generate cashflows to repay the debt at maturity date (Diamond, 1991).

Barclay and Smith (1995) state three hypothesis that determine the debt maturity. The contracting cost hypotheses describes that the firm´s characteristics, such as firm size, regulation, and firm´s investment opportunity set influence their contracting costs and therefore their optimal maturity choice. They argue that in the signaling hypothesis, good firms try to signal their quality by issuing short term debt. They argue pricing of long-term debt is more sensitive to changes in firm´s value and therefore the mispricing of long-term debt is larger and firms of bad quality will issue more overpriced long-term debt. They also state that there exists a pooling equilibrium in which both firms issue the same maturity, when the information asymmetries are small enough. Further they illustrate the tax hypothesis which implies longer

debt maturity if the interest rates curve is upward sloping. The bankruptcy risk increases over time and therefore the value of tax shield is higher with higher interest long-term debt and if the firm goes bankrupt, the more expensive rolling short term debt is not relevant (Barclay and Smith, 1995).

Ben-Nasr et al. (2015) research the agency problem between self-interested controlling shareholders and minority shareholders. Their results indicate that controlling owners extract private benefits from a firm and therefore adapt a longer debt maturity to avoid frequent monitoring by lenders.

Pour and Lasfer (2019) research shows that in countries with weaker shareholder protection the debt maturities are lower. They reason this phenomenon by the short-term debt taking over the monitoring of the manager that would not have done otherwise. The results of Pour and Lasfer indicate that investors push managers into taking shorter debt maturities if they have less ability to control the manager. Nevertheless, the studies only looked at the debt maturity but not how fast firms adjust the maturity.

Different papers researched different aspects of how firms adjust their capital structure. Kisgen (2009, 2006) is focusing on the effect of credit-rating changes. Kisgen´s results indicate that firms issue less likely debt if they are near an upgrade or downgrade of credit-rating. Huang and Shen (2015) researched how firms adjust the capital structure after a credit rating change as well. Their study indicates that firms adjust their capital structure after they get downgraded but not significantly when they get upgraded.

To estimate the adjustment speed for capital structure, several papers used a partial adjustment model, which is also use in this thesis. Although they are using the same econometric model, their research is focusing on different aspects on what determines the adjustment speed. Öztekin and Flannery (2012) findings are that firms with above average transaction costs adjust 12% slower while firms with above median benefits adjust 8% faster. Öztekin and Flannery´s findings are consistent with the dynamic trade-off theory. They are using a large international

dataset of listed firms and observe book debt ratio as well as market debt ratio as a proxy for capital structure. McMillan and Camara (2012) researched the difference in adjustment speed between multi-national firms and domestic-firms and come to the result that domestic companies adjust their capital structure faster. Another determinant of the capital structure adjustments seems to be the macroeconomic state. Gan et al. (2021) results indicate that firms adjust faster in good macroeconomic state and reason this with a lower presence of macroeconomic risk. Daskalakis et al. (2017) are focusing on the macroeconomic effects on the adjustment speed of debt maturity. Their study indicates that in crises, the adjustment speed for leverage and for the long-term debt ratio slows down, while the short-term debt ratio is not affected. As a stability test, Daskalakis et al. also replace the macro regressors with year dummies and the results stay significant.

Morellec et al. (2012) researched the agency conflict within the dynamic trade-off theory by estimating the manager´s private benefit effect on capital structure. In their model both transaction costs and agency costs are included. Morellec et al. results indicate that transaction costs are too small to explain firms financing policy but that agency costs of 1.5% of equity value are sufficient to explain the observed leverage ratios. This shows that agency conflicts have an influence on the capital structure choice and its adjustment speed.

The closest related paper to this thesis, Chang et al. (2014), is focusing on the agency conflict between shareholders and managers. They use a dataset from 1993-2009 with 4297 firm-year observations and the G-index and E-index as corporate governance proxy. Chang et al. divide the data set in well governed and poorly governed firms. Their results indicate that poorly governed firms adjust slower than their well governed counterparties. This is the case for underleveraged and overleveraged firms. Thereby, they conclude that self-interested mangers avoid the disciplinary effect of debt when the company is underleveraged and avoid the takeover threat when the firm is overleveraged. Their study implies that in high competition industries, firms adjust their capital structure faster than in low competition industries because

there is more pressure to maximize shareholder value. Within the high and low competition industries poor governance firms adjust still slower than their well governed counterparties (Chang et al., 2014).

3 Methodology

This research extends Chang et al. (2014) efforts by also observing the debt maturity in addition to the leverage ratio to extend the understanding of how self-interested managers adjust the capital structure. Based on the dynamic trade-off theory, an econometric model in which firms partially adjust their capital structure towards their target is chosen. Transaction cost and agency problems impede the firm to adjust their capital structure immediately after deviating from it.

A partial adjustment model is used to estimate the adjustment speed of capital structure. This thesis follows the research approach of Chang et al. (2014) and uses a 2-stage econometric model and a reduced model to estimate the adjustment speed of capital structure while also including governance as variable.

In the first stage of the 2-stage model, the optimal leverage ratio for the period t+1 gets estimate. The formula of equation (1) is as following:

$$DR_{(i,t+1)} = \gamma \mathrm{Gov}_{(i,t)} + \beta X_{(i,t)} + \upsilon_{(1i,t+1)} \quad (1)$$

where $Gov_{(i,t)}$ is the corporate governance variable, $X_{(i,t)}$ is a vector of firm characteristic variables which is elaborated in the next section $\upsilon_{(1i,t+1)}$ is the disturbance term with a zero mean and constant variance, and it is uncorrelated with the regressors; and γ and β are unknown parameters. DR is the debt ratio and the debt ratios which are examined are the market-debt ratio, the book-debt ratio and the current-debt ratio.

Following Chang et al. (2014) the standard partial adjustment model as in Fama and French (2002) and Kayhan and Titman (2007) is applied to estimate the adjustment speed. The optimal debt ratio $DR*_{(i,t+1)}$, gets estimated by equation (1). Then the difference to the target leverage

is used as independent variable to regress on the actual change in debt ratio. Equation (2) estimates the adjustment speed is as follows:

(2) $$DR_{(i,t+1)} - DR_{(i,t)} = \delta(\mathrm{DR}*_{(i,t+1)} - DR_{(i,t)}) + \upsilon_{(2i,t+1)}$$

where $\upsilon_{(2i,t+1)}$ is the disturbance term uncorrelated with regressors and δ represents the adjustment speed of leverage. A value of $\delta = 1$ would indicate that the firm fully adjusts for any deviation away from its target leverage within one period, whereas $\delta < 1$ implies the presence of adjustment costs and predicts persistent, undesired leverage ratios (Chang et al., 2014). The gap between the desired and actual leverage levels should decrease over time, provided δ is greater than zero (Chang et al., 2014). If there is a difference in adjustment speed, across corporate governance levels, it indicates an agency problem in the firm.

Likewise, Chang et al. (2014) this research uses the reduced model, by substituting equation (1) into equation (2). In the reduced model, only one regression is needed.

(3) $$DR_{(i,t+1)} = \delta\gamma Gov + \delta\beta X + (1-\delta)DR_{(i,t)} + \epsilon_{(i,t+1)}$$

In this equation $\epsilon_{(i,t+1)}$ is the error term, which is uncorrelated with the regressor. The coefficient of the DR at time t is $(1-\delta)$. Therefore, to get the value δ which is how much of the difference to the target gets closed from period t to period t+1, the coefficient must be subtracted from one.

Although, the partial adjustment model is the prevalent mythology to research capital structure adjustment speed, econometric issues arise. The main issue is that the target capital structure $\mathrm{DR}*_{(i,t+1)}$ is unobservable and is therefore measured with an error, which leads to biased estimates of adjustment speed for both models (Chang et al., 2014). According to Flannery and Rangan (2006) including firm fixed effects, leads to more accurate estimates for the leverage ratio. Therefore, only firms with at least two datapoints are included and a dummy variable for the firm to control for firm fixed effects is included.

The sample is divided into two groups, underleveraged and overleveraged firms. To determine if a firm is overleveraged or underleveraged, the approach of Berger et al. (1997) is used. Equation (1) estimates the optimal leverage. The firm is then defined as underleveraged (overleveraged) if the debt-ratio is below (above) its optimal leverage. Likewise, too high and too low debt maturity is defined. If the optimal current-debt ratio estimated with equation (1) lays below (above) the firm´s current current-debt ratio, the firm has a too short (long) debt maturity.

From the literature following hypotheses for the adjustment behavior are derived. H1 and H2 are adopted from Chang et al. (2014, pp. 376):

> *"**H1a.** For overleveraged firms, the adjustment speed of capital structure toward targets should be slower for firms with weak corporate governance (weak protection of shareholders) than for firms with strong corporate governance (strong protection of shareholders). The takeover defense effect of debt is more important than other factors for self-interested managers.*
>
> ***H1b.** For underleveraged firms, the adjustment speed of capital structure toward targets should be quicker for firms with weak corporate governance (weak protection of shareholders) than for firms with strong corporate governance (strong protection of shareholders). The takeover defense effect of debt is more important than other factors for self-interested managers.*
>
> ***H2a.** For overleveraged firms, the adjustment speed of capital structure toward targets should be quicker for firms with weak corporate governance (weak protection of shareholders) than for firms with strong corporate governance (strong protection of shareholders). The disciplinary effect of debt is more important than other factors for self-interested managers.*
>
> ***H2b.** For underleveraged firms, the adjustment speed of capital structure toward targets should be slower for firms with weak corporate governance (weak*

protection of shareholders) than for firms with strong corporate governance (strong protection of shareholders). The disciplinary effect of debt is more important than other factors for self-interested managers."

H3a. For firms with too short debt maturity, the adjustment speed of debt maturity towards targets should be quicker for firms with weak corporate governance (weak protection of shareholders) than for firms with strong corporate governance (strong protection of shareholders). Investors cannot incentivize managers of weak governed firms to strive a shorter debt maturity when doing adjustments.

H3b. For firms with too long debt maturity, the adjustment speed of debt maturity toward targets should be slower for firms with weak corporate governance (weak protection of shareholders) than for firms with strong corporate governance (strong protection of shareholders). Investors cannot incentivize managers of weak governed firms to strive a shorter debt maturity when doing adjustments.

4 Data and Variables

To find meaningful data about corporate governance is hard. Fortunately, in Refinitiv is a Corporate Governance index included and is accessible with the university. Refinitiv is a data provider for financial data such as income statements and balance sheets.

The relevant data is collected with the Refinitiv Data API and only developed markets are considered. Therefore the firms come from the following regions: United states of America, Canada, France, Switzerland, Germany, Austria, United Kingdom, Faroe Islands, Ireland, Iceland, Scandinavia, BeNeLux, Spain, Italy, and Portugal. The data consists of 6222 year-firm observations from 1052 firms between 2002 and 2020. Likewise previous corporate governance literature, the financial industry is excluded because capital structure is subject to regulatory factors and the utility industry is excluded because governance might be driven by regulatory factors (Dittmar and Mahrt-Smith, 2007; Jiraporn and Liu, 2008; Morellec et al., 2012).

Following the variables used to regress on firm´s debt ratio are illustrated. For further information about the calculation see Appendix I. Table 1 shows summary statistics and table 2 summary statistics by governance level.

Table 1: Summary statistics

	Mean	Median	Minimum	Maximum	Std. Dev.	N
MDR	0.362	0.319	0.000	1.000	0.242	6222
BDR	0.497	0.507	0.017	0.995	0.179	6222
CDR	0.562	0.544	0.000	1.000	0.232	6222
Year	2009	2008	2002	2019	4.51	6222
DEP	0.042	0.036	0.000	0.751	0.037	6222
EBIT	0.116	0.109	-1.661	3.672	0.168	6222
LnTA	7.385	7.446	-0.747	12.877	1.924	6222
MB	2.973	2.081	0.223	98.780	4.561	6222
FA	0.410	0.348	0.000	1.000	0.262	6222
RD	0.048	0.025	0.000	0.921	0.070	6222
MED MDR	0.311	0.331	0.091	0.676	0.107	6222
MED BDR	0.483	0.496	0.378	0.624	0.055	6222
MED CDR	0.562	0.576	0.102	0.848	0.114	6222
gov index	48.930	49.485	0.491	99.335	21.854	6222

The table shows mean, median, minimum, maximum, standard deviation, and the count of the variables. All data are from Refinitiv from the 10. february.2022. The variable definition can be found in the appendix.

4.1 Debt ratio

Consistent with previous literature o measure leverage, both book and market debt-ratio are used to measure leverage. Market leverage is a proxy for the relative ownership, while book leverage is independent on stock returns (Welch, 2004). Book leverage is defined as total debt divided by total assets and market leverage is defined by total debt divided by total debt plus market capitalization. Following Daskalakis et al. (2017) the current debt ratio is used to measure the debt maturity, which is defined as current debt divided by total debt. The market debt ratio is smaller than the book debt ratio. On average firms finance itself half with debt and half equity, if the book values are considered. Also, in the debt maturity firms on average more than half of the debt is current debt. In the dataset, firms with weak governance are less leveraged than firms with strong governance which is consistent with the findings of Jiraporn

and Liu (2008). The lower leverage can be observed for both market-leverage ratio and book-leverage ratio. Consistent with previous research (Pour and Lasfer, 2019), it can be observed that week governance firms have a shorter debt maturity than strong governance firms. The average current-debt ratio for week governance firms is 0.58, while it is 0.53 for strong governance firms.

4.2 Year

Firms issue more equity when their market value is high and repurchase equity when their market value is low (Baker and Wurgler, 2002). Therefore, a correlation between boom times and the capital structure adjustment is likely. Also, the macrocosmic risk seems to influence the firm´s financing decisions (Gan et al., 2021). A year as a dummy variable is included to compromise for such year specific effects. Considering that the data for strong governance firms is from later years, the inclusion of year fixed effects becomes especially important.

4.3 Depreciation

Firms with high depreciation have less incentives for tax deductions by interest expenses and therefore the leverage ratio is lower for firms with high depreciation (Öztekin and Flannery, 2012). Depreciation is computed by dividing depreciation by total assets. Firms in the data set have on average depreciation and amortization of 4% of total assets. There are also some outliers in the data which have depreciations of up to 75%.

4.4 EBIT

Earnings before interest and taxes divided by total assets is a profitability measure. It can have both positive and negative effect on capital structure (Öztekin and Flannery, 2012). The EBIT is calculated by dividing EBIT by total assets. There is a broad variety in the profitability with an average of 11.6%. There cannot be seen a big difference in the profitability across

governance levels, but on average the EBIT of strong governance firms is 1.2% higher than week governed firms.

4.5 Logarithm of total assets

This variable is a size measure of the firm. Larger firms tend to operate with higher debt levels because they are more transparent, have lower asset volatility or have better access to public markets (Öztekin and Flannery, 2012). Size is also determining the debt maturity because larger firms are of higher credit quality, they can obtain long-term debt easier (Ben-Nasr et al., 2015). There is also a correlation between size and governance in the dataset. Larger firms have higher corporate governance quality.

4.6 Market-to-book ratio

As a proxy for future investment opportunities. It can have the effect that firms want to protect these by limit their leverage (Flannery and Rangan, 2006). Future investment opportunities may also have the opposite effect if not enough cash is available, debt will be used for financing (Drobetz and Wanzenried, 2006). Myers (1977) argues that firms with larger growth face conflicts between shareholders and debt holders. One way of reducing such conflicts is shortening debt maturity. In the data set the median market-to-book ratio is 2.08 but it has a large variance. It goes from very low ratio of under 1 in the times of financial crises to a maximum of 98.

4.7 Fixed assets

Firms with more fixed assets have a higher debt-capacity because they have more credibility in repaying their debt (Chang et al., 2014). This is because they can liquidate their assets easier in case of financial distress (Chang et al., 2014). Fixed assets are computed through dividing by total assets. The mean in the dataset is 0.41 and the standard deviation is 0.26. The broad variance reflects that many different industries are represented in the dataset.

4.8 Research and Development

In the case of bankruptcy, debtholders may liquidate the asset of the firm to recover a part of their loss. If the firm has very specific assets, the liquidation value would be low. The loss will be greater, as higher the level of firm specificity is. Therefore, debtholder will be less willing to finance a firm with high specificity investments (Williamson, 1988). As a measure for specificity of assets, R&D expenses are often used (Helfat, 1994). In the dataset there are around the half of the R&D expenses data missing. To handle this problem, four different approaches are used. First, the variable is excluded completely from the regressions. Second, only data points where R&D expenses are available are included in the regressions. Third, the missing data are replaced with the industry median and last, a regression on R&D expenses with the available data is used to estimate the R&D expenses for all data points. With the different approaches the results changed only in a single-digit percentage scope in terms of adjustment speed by governance. Because the results stay overall consistent, only the results received when using the industry median are displayed. To obtain the variable R&D expenses is divided by total assets.

4.9 Median leverage

To control for industry specific characteristics, the industry median of the debt ratio is included. To calculate this variable for a specific company the observed company is excluded and the median of the debt ratio for all remaining companies in the same industry is computed. For the book debt ratio, market debt ratio and current debt ratio the median is calculated, respectively. In terms of governance, it can be observed the same tendency as for the debt ratios but with a smaller magnitude.

4.10 Governance

As a proxy of corporate governance serves the corporate governance pillar of the ESG rating from Refinitiv. The corporate governance index is a weighted sum of three categories:

shareholders, corporate social responsibility (CSR) strategy and management. The categories have different maximum scores and different weights. The weights and scores for the industries in the dataset are as following:

Category	Scores	Weights
Shareholders	0.73	0.2
CSR strategy	0.34	0.13
Management	0.19	0.67

The governance score gets computed by multiplying the score with the corresponding weight and adding up the three results. Berg et al. (2021) raised critics about ESG data from Refinitiv because the mythology changed in the past. According to Berg et al., the methodology change had the consequence that results heavily depend on the time of the data download. But they also state that the governance pillar seems to be barely affected by these mythology changes. A reason for the stable governance measures may be that governance data already have been analyzed over decades and literature has largely settled the criteria for what comprises good governance (Berg et al., 2021). To group the firms into well, medium, and poorly governed firms, the data is divided based on the governance index into three equally large parts. The highest (lowest) tercile of the governance index consists of the well (poorly) governed firms.

Table 2: Statistics by governance

	weak gov		medium gov		strong gov	
	Mean	*Std. Dev.*	Mean	*Std. Dev.*	Mean	*Std. Dev.*
MDR	0.347	*0.245*	0.348	*0.238*	0.390	*0.241*
BDR	0.487	*0.186*	0.487	*0.178*	0.516	*0.173*
CDR	0.582	*0.238*	0.577	*0.235*	0.527	*0.220*
Year	2007	*3.99*	2009	*4.37*	2010	*4.73*
DEP	0.043	*0.045*	0.044	*0.038*	0.040	*0.027*
EBIT	0.112	*0.175*	0.113	*0.156*	0.124	*0.172*
LnTA	6.907	*1.753*	7.186	*1.892*	8.061	*1.931*
MB	3.243	*5.171*	2.981	*4.066*	2.695	*4.360*
FA	0.399	*0.264*	0.413	*0.259*	0.417	*0.262*
RD	0.054	*0.077*	0.050	*0.074*	0.041	*0.055*
MED MDR	0.310	*0.111*	0.310	*0.106*	0.314	*0.104*
MED BDR	0.480	*0.057*	0.483	*0.055*	0.488	*0.053*
MED CDR	0.571	*0.117*	0.570	*0.115*	0.546	*0.108*
gov index	24.1	*9.4*	49.3	*6.3*	73.5	*9.1*
N	2074		2074		2074	

The table shows the mean and standard deviation of the variables across governance terciles. The dataset is divided based on the governance index. Strong (Weak) governance firms are those firms located in the highest (lowest) tercile of the governance index because they have stronger (weaker) shareholder protection; firms located somewhere between weak governance and strong governance have medium governance. All data are from Refinitiv from the 10. february.2022. The variable definition can be found in the Appendix.

5 Empirical Results

To research the adjustment speed of leverage ratios, both book and market leverage ratios are considered. For the research of the adjustment of debt maturity, the current debt ratio is evaluated. The adjustment speed is researched with respect to the firm is currently overleveraged or underleveraged. For the debt maturity, the research analyses firms with too long and too short debt maturity.

5.1 Leverage

In Table 3 are the results of equation (2), the second stage of the 2-stage model. To save space only the coefficient for DR $*_{(i,t+1)} - DR_{(i,t)}$ and model statistics are displayed. TARGDIF is the closed gap to the target. When looking at market leverage ratios in Panel A, weak

governance firms close 31.8% of the gap, while medium governance firms close 31.2% and strong governance firms close only 27.1%. Wald tests are calculated, to control if the coefficients across the different governance levels are the same, and thereby if firms with different governance adjust at the same speed. The test if the coefficient of the week governance and strong governance firms is significant at a 5% significance level. Thereby, the hypothesis that week governance and strong governance firms adjust their capital structure at the same speed can be rejected. When looking at book-debt ratios in Panel B, similar results can be observed. Week governance firms close 19.7% of the gap to the target, while medium and strong governance firms close only 16.4% of the leverage gap. These results imply that firms with weak and strong governance does not adjust their capital structure with the same speed.

Table 3. 2 stage regression for leverage

Regression results for adjustment speed estimates from a two-stage dynamic partial adjustment capital structure model

	$Dr_{i,t+1} - Dr_{i,t}$		
	Weak	Medium	Strong
Panel A. Results from regression when Leverage is measured by Market Debt ratio			
TARGDIF	0.318***	0.312***	0.271***
STD	(0.015)	(0.016)	(0.015)
Year Effects	Yes	Yes	Yes
Obs.	2053	2059	2064
R-squared	0.173	0.163	0.142
Wald Test p-value W vs. M	0.385		
Wald Test p-value M vs. S		0.061	
Wald Test p-value W vs. S			0.033
Panel B. Results from regression when Leverage is measured by Book Debt ratio			
TARGDIF	0.197***	0.164***	0.164***
STD	(0.012)	(0.011)	(0.011)
Year Effects	Yes	Yes	Yes
Obs.	2053	2059	2059
R-squared	0.114	0.092	0.092
Wald Test p-value W vs. M	0.061		
Wald Test p-value M vs. S		0.399	
Wald Test p-value W vs. S			0.061

*** p-value < 0.001, ** p-value < 0.01, * p-value < 0.05

This table displays the second-stage results from estimating Eq. (2) controlling for year fixed effects across strong, medium, and weak governance firm qualities. The estimated results for weak, medium, and strong governance sub-samples with the market-book ratio and book-debt ratio are displayed, respectively in panels A and B. The sample is divided into governance index terciles: strong (weak) governance firms are those firms located in the highest (lowest) tercile of the governance index, because they have stronger (weaker) shareholder protection; firms located somewhere between weak governance and strong governance have medium governance quality. In the table are only displayed the coefficients of TARGDIF $(\mathrm{DR}*_{(i,t+1)} - DR_{(i,t)})$, to save space. To examine if the adjustment speed across governance levels is different, a Wald test is used is with the null hypothesis of equal adjustment speeds for weak vs. medium, medium vs. strong, or strong vs. weak governance firms respectively and the p-values are reported.

The reduced model is used to examine differences in the adjustment speed across governance levels as well. In table 4 the results of the reduced model can be observed. The debt ratio at t, $DR_{(i,t)}$, is reported as lagged leverage, LAGLEV. The market-leverage ratios in Panel A, indicate that week governance firms adjust their capital structure faster. Weak governance close 28.3% (1-0.717) of the gap to the target ratio, while medium governance firms close 27.6% (1-0.724) and strong governance firms close only 22.8% (1-0.772) of the gap. The Wald test is also significant at a 5% significance level. For book-leverage ratios in Panel B, the results stay stable. Weak governance firms close 20.8% (1-0.792) of the gap to the target while medium governance firms close 16.6% (1-0.834) and strong governance firms close only 15.4% (1-0.846) of the gap to the target within one period. The adjustment speed is significantly different between weak and strong governance firms at a 1% significance level.

Table 4. reduced model for leverage

Regression results for adjustment speed estimates from the reduce dynamic partial adjustment capital structure model.

	Weak	Medium	Strong
Panel A. Results from regression when Leverage is measured by Market Debt ratio			
LAGLEV	0.717***	0.724***	0.772***
STD	(0.015)	(0.016)	(0.014)
Year Effects	Yes	Yes	Yes
Obs.	2074	2074	2074
R-squared	0.624	0.640	0.677
Wald Test p-value W vs. M	0.380		
Wald Test p-value M vs. S		0.030	
Wald Test p-value W vs. S			0.013
Panel B. Results from regression when Leverage is measured by Book Debt ratio			
LAGLEV	0.792***	0.834***	0.846***
STD	(0.013)	(0.012)	(0.011)
Year Effects	Yes	Yes	Yes
Obs.	2074	2074	2074
R-squared	0.707	0.762	0.813
Wald Test p-value W vs. M	0.020		
Wald Test p-value M vs. S		0.300	
Wald Test p-value W vs. S			0.002

*** p-value < 0.001, ** p-value < 0.01, * p-value < 0.05

This table displays the second-stage results from estimating Eq. (3) controlling for year fixed effects across strong, medium, and weak governance firm qualities. The estimated results for weak, medium, and strong governance sub-samples with the market-book ratio and book-debt ratio are displayed, respectively in panels A and B. The sample is divided into governance index terciles: strong (weak) governance firms are those firms located in the highest (lowest) tercile of the governance index, because they have stronger (weaker) shareholder protection; firms located somewhere between weak governance and strong governance have medium governance. In the table are only displayed the coefficients of LAGLEV $DR_{(i,t)}$, to save space. To examine if the adjustment speed across governance levels is different, a Wald test is used is with the null hypothesis of equal adjustment speeds for weak vs. medium, medium vs. strong, or strong vs. weak governance firms respectively and the p-values are reported.

Chang et al. (2014) report also a significant different adjustment speeds between weak and strong governance firms. In their results medium governance firm's adjustment speed is in each case between the weak and strong governance firms. In contrast to this thesis, they report a slower adjustment speed for weak governance firms.

In table 5, the regression with the reduced model is repeated, but the sample is splited into overleveraged and underleveraged firms. Following Berger et al (1997) and Chang et al. (2014)

this research defines a firm as underleveraged (overleveraged) if its leverage falls below (above) the predicted leverage. The target leverage is estimated with equation (1).

Table 5. reduced model for over- and underleverage

Regression results for underlevered and overlevered categories.

	overleverd		underlevered	
	weak	strong	weak	strong
Panel A. Results from regression when Leverage is measured by Market Debt ratio				
LAGLEV	0.533***	0.581***	0.957***	0.966***
STD	(0.039)	(0.039)	(0.041)	(0.041)
Year Effects	Yes	Yes	Yes	Yes
Obs.	831	889	1222	1175
R-squared	0.426	0.417	0.510	0.579
Wald Test p-value W vs. S	0.271		0.394	
Panel B. Results from regression when Leverage is measured by Book Debt ratio				
LAGLEV	0.744***	0.812***	0.812***	0.876***
STD	(0.028)	(0.025)	(0.030)	(0.025)
Year Effects	Yes	Yes	Yes	Yes
Obs.	1004	1017	1049	1047
R-squared	0.541	0.675	0.572	0.742
Wald Test p-value W vs. S	0.075		0.108	

*** p-value < 0.001, ** p-value < 0.01, * p-value < 0.05

Following Berger et al. (1997) and Chang et al. (2014), a firm-year observation is defined as underleveraged (overleveraged) if firms have less (more) leverage than predicted. observations with a target leverage below 0 and over 1 are excluded. The results from estimating a reduced-form partial adjustment model using Eq. (3) across governance terciles are displayed in panels A and B for underleveraged and overleveraged firm samples, respectively. The sample is divided into governance index terciles: weak (strong) governance firms are those firms located in the lowest (highest) tercile of the governance index, because they have weaker (stronger) shareholder protection. In the table only the coefficients of LAGLEV $DR_{(i,t)}$ is displayed, to save space.

For market-leverage ratios in panel A, it can be observed that firms with weak governance adjust their capital structure faster than strong governance firms for both overleveraged and underleveraged firms. When firms are overleveraged, weak governance firms close 46.7% (1-0.533), while strong governance firms close only 41.9% (1-0.581) of the gap to the target. When firms are underleveraged, weak governance firms close 4.3% (1-0.957), while strong governance firms close only 3.4% (1-0.966) of the gap to the target. The Wald test to examine if the adjustment speed between strong governance and weak governance firms is different is not significant for market-leverage ratios. For book-leverage ratios it can be observed that weak

governance firms adjust their capital structure faster as well. If the firm is overleveraged, weak governance firms close 25.6% (1-0.744) of the gap to the target. Strong governance firms close only 18.8% (1-0.581) of the gap. If the firm is underleveraged, weak governance firms close 18.8% (1-0.581) and strong governance firms close 12.4% (1-0.876) of the gap to the target. For overleveraged firms the Wald test is significant at a 10% confidence level and for underleveraged firms it is with a p-value of 0.108 only slightly not significant.

Consistent with H2a, if the firm is overleveraged, self-interested managers lower the firms leverage faster than managers in firms that can control managers better. This is because self-interested managers avoid the disciplinary effect of debt. They lower the firm's capital structure, faster, if they cannot get controlled by investors properly. In firms with strong corporate governance, investors can control managers better and therefore the interests of managers and investors are aligned better. Further it can be observed that for both market-leverage and book-leverage, the adjustment speed is faster for overleveraged firms than for underleveraged firms. It seems that too high leverage is more significant reason for firms to adjust the firm's capital structure.

In contrast to the results in this thesis, Chang et al. (2014) report opposite effects in terms of governance and over and under leverage. Their results indicate that weak governance firms adjust more slowly, regardless of the firm is overleveraged or underleveraged. The results of this thesis indicates that firms with weak governance always adjust quicker to the target. In this results and Chang et al. results, switching incentives of self-interested managers can be observed. The takeover-defense effect or the disciplinary effect is more important, depending on the firm is currently over levered or underleveraged. Managers choose the capital structure in order to exploit private benefits. Corporate governance seems to be able to align managers incentives with the shareholder incentive and therefore can help to minimize agency costs.

5.2 Debt maturity

To research how managers adjust the firm´s debt maturity, the current debt ratio is used. In table 6 are the results of the two-stage model. The adjustment speed of the maturity is very similar across governance levels. Weak governance firms close 18.3% of the gap to the target leverage, while strong governance firms adjust almost the same fraction of 18.0%. The medium governance firms adjust a bit faster but with 19.5% not significantly. Also, the Wald tests are not significant, and therefore it cannot be concluded from the results, that firms with different governance levels adjust their debt maturity differently.

Table 6. 2 stage regression for maturity

Regression results for adjustment speed estimates from a two-stage dynamic partial adjustment debt maturity model

	$CDr_{i,t+1} - CDr_{i,t}$		
	Weak	Medium	Strong
MATDIF	0.183***	0.195***	0.180***
STD	(0.013)	(0.012)	(0.012)
Year Effects	Yes	Yes	Yes
Obs.	2070	2074	2070
R-squared	0.090	0.106	0.103
Wald Test p-value W vs. M	0.314		
Wald Test p-value M vs. S		0.266	
Wald Test p-value W vs. S			0.393

*** p-value < 0.001, ** p-value < 0.01, * p-value < 0.05

This table displays the second-stage results from estimating Eq. (2) controlling for year fixed effects across strong, medium, and weak governance firm qualities. It displays the estimated results with the current-debt ratio for weak, medium, and strong governance sub-samples. The sample is divided into governance index terciles: strong (weak) governance firms are those firms located in the highest (lowest) tercile of the governance index, because they have stronger (weaker) shareholder protection; firms located somewhere between weak governance and strong governance have medium governance. In the table are only displayed the coefficients of MATDIF ($\mathrm{CDR}*_{(i,t+1)} - CDR_{(i,t)}$), to save space. To examine if the adjustment speed across governance levels is different, a Wald test is used is with the null hypothesis of equal adjustment speeds for weak vs. medium, medium vs. strong, or strong vs. weak governance firms respectively and the p-values are reported.

In table 7, it can be found the results of the reduced model, equation (3). The results of the reduced model are very similar to the 2-stage model. Weak governance firms close 17.8% (1-0.822) of the target to the gap and strong governance firms 17.4% (1-0.826). Medium governance firms adjust a bit faster and close 19.3% (1-0.807) of the gap to the target. Likewise, the 2-stage model, the Wald tests are not significant. Regarding the governance levels, it cannot be observed a difference in adjustment speed of the debt maturity.

Table 7. reduced model for maturity

Regression results for adjustment speed estimates from the reduced-form dynamic partial adjustment short-term-debt ratio model.

	Weak	Medium	Strong
LAGMAT	0.822***	0.807***	0.826***
STD	(0.013)	(0.013)	(0.012)
Year Effects	Yes	Yes	Yes
Obs.	2074	2074	2074
R-squared	0.727	0.752	0.773
Wald Test p-value W vs. M	0.290		
Wald Test p-value M vs. S		0.228	
Wald Test p-value W vs. S			0.389

*** p-value < 0.001, ** p-value < 0.01, * p-value < 0.05

This table displays the second-stage results from estimating Eq. (3) controlling for year fixed effects across strong, medium, and weak governance firm qualities. It displays the estimated results with the current-debt ratio for weak, medium, and strong governance sub-samples. The sample is divided into governance index terciles: strong (weak) governance firms are those firms located in the highest (lowest) tercile of the governance index, because they have stronger (weaker) shareholder protection; firms located somewhere between weak governance and strong governance have medium governance. In the table are only displayed the coefficients of LAGMAT $CDR_{(i,t)}$, to save space. To examine if the adjustment speed across governance levels is different, a Wald test is used is with the null hypothesis of equal adjustment speeds for weak vs. medium, medium vs. strong, or strong vs. weak governance firms respectively and the p-values are reported.

To get a better picture of how firms adjust their debt maturity, the sample is separated into firms with too high and too low maturity. This research defines a firm has too long (short) if its current debt ratio falls below (above) the predicted current debt ratio. The predicted leverage is estimated with equation (1) and the results of equation (3) are reported in table 8. If a firm has a too long maturity, weak governance firms close with 9.6% (1-0.904) less target gap than firms with strong governance with 16.5% (1-0835). In the case of too short maturity, the opposite result in terms of adjustment speed can be observed. Weak governance firms close 25.7% (1-0.743) of the gap to the target, while strong governance firms close only 14.6% (1-0.854) of the gap. In the case of too short maturity, the adjustment speed of weak governance firms is significantly different from the one with strong corporate governance, at a 5% significance level. For the case of too long maturity, the Wald test is with a p-value of 0.101 only slightly not significant. The adjustment speed of strong governance firms stays relatively stable, regardless of the firm has too short or too long debt maturity. Firms with weak corporate

governance adjust much faster when they have a too short debt maturity and slower if they have a too high debt maturity. These findings are consistent with H3a and H3b. Self-interested managers avoid the disciplinary effect of debt and therefore always try to extend the debt maturity. Investors cannot control the managers actions appropriately. This hidden action of the manager is a direct consequence of the agency problem between investors and managers.

Table 8. reduced model for over- undermaturity

Regression results for too short/long debt maturity from the reduced-form dynamic partial adjustment model.

	too long maturity		too short maturity	
	weak	strong	weak	strong
LAGMAT	0.904***	0.835***	0.743***	0.854***
STD	0.028	0.030	(0.037)	(0.030)
Year Effects	Yes	Yes	Yes	Yes
Obs.	1014	1014	1056	1056
R-squared	0.655	0.594	0.454	0.664
Wald Test p-value W vs. S	0.101		0.026	

*** p-value < 0.001, ** p-value < 0.01, * p-value < 0.05

A firm-year observation has too long maturity (too short maturity) if firms have less (more) current-debt than predicted. Observations with a target current-debt ratio below 0 and over 1 are excluded. The results shown from estimating a reduced-form dynamic partial adjustment model using Eq. (3) across governance terciles for too long maturity and too short maturity firm samples, respectively. The sample is divided into governance index terciles: weak (strong) governance firms are those firms located in the lowest (highest) tercile of the governance index, because they have weaker (stronger) shareholder protection. In the table are only displayed the coefficients of LAGMAT $DR_{(i,t)}$, to save space.

5.3 Stability test for omitted variables

Likewise, the results of Chang et al. (2014) the regression results of this research could be subject to an endogeneity problem of omitted variable. They state that such problem could arise, if the corporate governance index is correlated with unobserved firm characteristics, which are not part of the empirical model. Following Chang et al., equation (3) is estimated again and the interaction term between corporate governance and firm characteristics is included. The equation for the reduced model including the interaction term can be seen in equation (4),

$$DR_{(i,t+1)} = \delta\gamma Gov + \delta\beta X + \delta\alpha(Gov{:}X) + (1-\delta)DR_{(i,t)} + \epsilon_{(i,t+1)} \quad (4)$$

where α is the coefficient of the interaction term. The results of equation (4) are reported in Table 9. To save space only the target difference and the interaction terms between corporate governance and firm characteristics are reported.

Table 9. stability test

Adjustment for omitted variables

	overleverd		underlevered	
	weak	strong	weak	strong
Panel A. Results from regression when Leverage is measured by Market Debt ratio				
LAGLEV	0.528***	0.576***	0.963***	0.973***
	0.039	0.040	0.042	0.042
DEP:gov_index	0.027	0.031	-0.001	-0.010
	0.016	0.036	0.008	0.015
EBIT:gov_index	0.011*	-0.001	0.002	0.002
	0.006	0.006	0.003	0.004
LnTA:gov_index	0.000	-0.001	0.001**	-0.001**
	0.000	0.000	0.000	0.000
MB:gov_index	0.000	-0.003*	0.000	0.000
	0.001	0.001	0.000	0.000
FA:gov_index	-0.002	0.001	-0.001	0.001
	0.003	0.003	0.002	0.002
RD:gov_index	-0.013	-0.002	0.013	0.000
	0.012	0.022	0.007	0.008
MED MDR:gov_	0.003	0.001	0.006	0.003
	0.007	0.008	0.004	0.004
Year effect	Yes	Yes	Yes	Yes
Obs.	831	889	1222	1175
R-square	0.443	0.433	0.518	0.590

Panel B. Results from regression when Leverage is measured by Book Debt ratio

LAGLEV	0.826***	0.916***	0.810***	0.866***
	0.023	0.027	0.018	0.015
DEP:gov_index	0.010	-0.011	-0.010	0.002
	0.008	0.016	0.007	0.010
EBIT:gov_index	0.006*	0.002	0.007**	-0.009***
	0.003	0.003	0.002	0.003
LnTA:gov_index	-0.000*	0.000	0.000	0.000
	0.000	0.000	0.000	0.000
MB:gov_index	0.000	0.001	-0.000**	0.000
	0.000	0.001	0.000	0.000
FA:gov_index	-0.001	0.001	-0.001	0.001
	0.001	0.001	0.001	0.001
RD:gov_index	0.003	0.009	0.005	-0.001
	0.006	0.009	0.006	0.005
MED MDR:gov_	0.009	0.002	0.002	0.006
	0.006	0.006	0.006	0.005
Year effect	Yes	Yes	Yes	Yes
Obs.	831	889	1222	1175
R-square	0.443	0.433	0.705	0.822

Panel C. Results from regression for Debt Maturity

	too long maturity		too short maturity	
LAGMAT	0.876***	0.842***	0.811***	0.804***
	0.018	0.018	0.019	0.017
DEP:gov_index	-0.027**	-0.020	0.002	0.017
	0.010	0.021	0.008	0.015
EBIT:gov_index	-0.005	-0.004	-0.003	0.001
	0.003	0.003	0.003	0.004
LnTA:gov_index	0.000	0.001**	-0.001*	0.001**
	0.000	0.000	0.000	0.000
MB:gov_index	0.000	-0.001	0.000**	0.000
	0.000	0.001	0.000	0.000
FA:gov_index	0.000	-0.001	0.001	-0.001
	0.002	0.002	0.002	0.002
RD:gov_index	0.010	-0.005	-0.005	-0.004
	0.007	0.012	0.008	0.008
MED MDR:gov_	-0.008	0.007	-0.001	0.003
	0.004	0.005	0.004	0.004
Year effect	Yes	Yes	Yes	Yes
Obs.	831	889	1222	1175
R-square	0.811	0.790	0.695	0.760

*** p-value < 0.001, ** p-value < 0.01, * p-value < 0.05

This table displays the results of equation (4) for the strong and weak governance subsamples and subsamples for too high and low debt ratios respectively. Panel A, B and C report the results for market-debt ratio, book-debt ratio and current debt ratio. In the table are only displayed the coefficients of the adjustment speed and the interaction terms, to save space.

For the leverage ratio in panel A and B, there can be observed an interaction between corporate governance and EBIT. Further there seems to exist an interaction with firm size and market to book ratio. In the stability test of Chang et al., the same interaction terms were significant, as well. This indicates that governance has not only a direct effect on the adjustment speed of capital structure, but also an indirect effect by the interaction between governance and firm characteristics. The overall results of Table 5 also stay stable when including the interaction term in the regression. Firms with weak corporate governance quality adjust the capital structure faster than their counterparties with strong governance. This is the case regardless of the firm is overleveraged or underleveraged.

For the debt maturity in panel C, there can be observed an interaction between corporate governance depreciation, size, and market to book ratio. This indicates that governance has not only a direct effect on the adjustment speed of debt maturity, but also an indirect effect by the interaction between governance and firm characteristics. For firms with a too high maturity, the results stay consistent with the results of table 8. The firms with weak corporate governance quality, adjust slower to their target debt maturity. In the case of too short maturity the results are not stable. By including the interaction term, weak governance firms adjust their debt maturity slightly slower than strong governance firms. This result is inconsistent with the previous results in table 8.

6 Conclusion

This thesis investigates how self-interested managers adjust the firm's leverage and debt maturity. The takeover defense effect as well as the disciplinary effect ought to be considered as incentives for managers to deviate from optimal adjustments for shareholders. Therefore, a partial adjustment model is applied and both overleveraged as well as underleveraged firms are considered.

The final results indicate that when corporate governance mechanisms are weak, managers change the capital structure in their personal advantage. In the case of the firm being underleveraged, self-interested managers adjust faster to the target leverage. The increase in leverage is consistent with Berger et al. (1997). Managers avoid the takeover treat and increase leverage faster when they cannot be controlled appropriately. The takeover defense is the dominant factor for self-interested managers when the firm is underleveraged. In conflict to Berger et al. (1997) if the firm is overleveraged, self-interested managers adjust faster to the target leverage, as well. If the firm is overleveraged, the dominant factor for self-interested managers is to avoid the disciplinary effect of debt. To avoid the disciplinary effect of debt, manager lower the leverage faster when the firm is poorly governed. Consistent with Grossman and Hart (1982) self-interested managers avoid debt, because that way they are to exploit more private benefits if the firm is less levered.

The debt maturity is subject to the agency problem as well. The given results indicate that self-interested managers avoid short term debt when adjusting the capital structure. When the firm has an excessively low debt maturity, weakly governed firms adjust more quickly toward their target. Managers prolong the debt maturity because they seek to avoid the disciplinary effect of short-term debt, in order to lower the risk of losing the job when debt cannot be repaid. If the firm has an excessively high debt maturity, weakly governed firms adjust slower toward the target. This is because managers have no incentive to shorten the debt maturity if they are not incentivized by corporate governance mechanisms. Nevertheless the results are meaningful in an economic sense, the hypothesis does not hold in the stability test and is therefore disputable.

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8 Appendix

8.1 Appendix I

Table 10. variable definition

name	variable	calculation
BDR	Book-debt-ratio	$BDR = \frac{bookdebt}{\text{bookdebt} + \text{book equity}}$
MDR	Market-debt-ratio	$MDR = \frac{bookdebt}{\text{bookdebt} + \text{marketcapitalization}}$
CDR	Current-debt-ratio	$CDR = \frac{currentdebt}{\text{currentdebt} + \text{noncurrent debt}}$
DEP	Depreciation	$DEP = \frac{depreciation}{\text{total assets}}$
EBIT	Earnings Before Interest and Taxes	$EBIT = \frac{EBIT}{\text{total assets}}$
LNTA	Natural logarithm of Total Assets	$LNTA = \ln(total\ assets)$
MB	Market to Book ratio	$MB = \frac{book\ debt + marketcapitalization}{\text{total assets}}$
FA	Fixed Assets	$FA = \frac{fixed\ assets}{\text{total assets}}$
RD	Research and Development	$RD = \frac{R\&D\ expenses}{\text{total assets}}$
MED	Industry median	*MED = median of (BDR, MDR or CDR)*
Gov	Governance	*Refinitiv governance index*

9 Abstract English

Using a dynamic partial adjustment model, this study investigates the impact of corporate governance on the adjustment speed of the capital structure as well as the debt maturity. The purpose of this research is to examine how quickly self-interested managers adjust the firm´s capital structure if they do not get controlled properly by corporate governance mechanisms. The findings show that managers exploit insufficient governance mechanisms and adjust significantly differently from a well-governed firm. If a firm is underleveraged, the take-over defense effect of debt dominates and self-interested managers increase the leverage more quickly than their well governed counterparts. If a firm is overleveraged, the disciplinary effect of debt dominates, and self-interested managers decrease the leverage faster than their well governed counterparts. In terms of debt maturity, self-interested managers avoid the disciplinary effect of debt, when doing adjustments. When the firm has a debt maturity that is too short, poorly governed firms adjust more quickly because managers have an incentive to prolong the debt maturity. As opposed to that, when the firm has a debt maturity that is too long, poorly governed firms adjust slower because managers have no incentive to shorten the debt maturity.

10 Abstract German

Durch das Nutzen eines dynamischen Teilanpassung Modelles, untersucht diese Studie, den Einfluss von Corporate Governance auf die Anpassungsgeschwindigkeit der Kapitalstruktur sowie der Fremdkapital Laufzeit. Das Ziel dieser Untersuchung ist es zu begutachten, wie eigennützige Manager die Kapitalstruktur des Unternehmens anpassen, wenn diese nicht durch Corporate Governance Mechanismen kontrolliert werden. Die Ergebnisse zeigen, dass Manager ungenügende Corporate Governance Mechanismen ausnutzen und signifikant unterschiedlich von einem gut geführten Unternehmen Anpassungen durchführen. Wenn ein Unternehmen zu wenig Fremdkapital hat, dominiert der Effekt zur Verteidigung einer Übernahme und eigennützige Manager erhöhen den Verschuldungsgrad schneller als ihr gut geführtes Pendant. Wenn ein Unternehmen zu viel Fremdkapital hat, dominiert der disziplinäre Effekt von Fremdkapital und eigennützige erhöhen den Verschuldungsgrad schneller als ihr gut geführtes Pendant. In Bezug auf die Fremdkapitallaufzeit, vermeiden Manager den disziplinären Effekt von Fremdkapital, wenn sie Anpassungen vornehmen. Wenn das Unternehmen eine zu kurze Fremdkapitallaufzeit hat, passen schwach geführte Unternehmen die Laufzeit schneller an, da Manager einen Anreiz haben die Fremdkapitallaufzeit zu verlängern. Im Gegenzug passen schwach geführte Unternehmen die Fremdkapitallaufzeit langsamer an, wenn die Laufzeit zu lang ist, weil Manager keinen Anreiz haben die Fremdkapitallaufzeit zu kürzen.