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Abstract

There is strong empirical evidence that firms do not always adjust their capital structure according to established capital structure theories. Rather, they follow a passive strategy such that capital structure changes are mainly driven by their stock returns. This paper investigates to what extent this behavioral inertia can be explained by the structure of executive compensation. Our data comprise US firms in the manufacturing industries over the years 1992 to 2000. We estimate a dynamic panel data model and find evidence for the hypothesis that stronger incentives schemes for CEOs lead to less capital structure inertia.

JEL Classification: G32, J33, C23

Key Words: capital structure, CEO compensation, dynamic panel data model

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1 Introduction

How do firms really decide on their capital structure? Do they adjust the mix of debt and equity according to theories of optimal capital structure? A recent paper by Welch (2002) provides strong empirical evidence for the hypothesis that firms do not always adjust their capital structure based on to these well-established theories, but that the firms are basically inert and their capital structure changes are mainly driven by their stock returns. If there is a positive shock to the enterprise value, for instance, a firm's bankruptcy risk decreases. According to theory we expect the firm to increase its leverage to capture additional tax benefits of debt. When the firm does not adjust its leverage, i.e., if it follows an inertia strategy, its debt-to-equity ratio decreases.

While Welch (2002) proposes a neat quantitative approach for measuring the firms' capital structure inertia behavior[1], he does not explain why firms are inert. The aim of our paper is to try to explain firms' capital structure inertia via the structure of the executive compensation. We claim that capital structure inertia is, at least partly, related to the agency problem caused by the separation of ownership and control of the firm. It is well known from agency theory that firms can use, e.g., cash compensation, stock option awards or ownership in the firm as incentives for executives to align their interests with those of the firm owners. We also know from capital structure theory that the use of these incentive schemes may interact with the firms' capital structure choice.

A number of papers investigate the relationship between capital structure choice and executive compensation. Agrawal and Mandelker (1987) examine the relationship between common stock and option holdings of managers and the choice of investment and financing decisions by firms. They provide empirical evidence for the hypothesis that security holdings by executives may reduce the agency problem in the sense that they induce executives to make investment and financing decisions in the interest of shareholders.

Friend and Lang (1988) test whether capital structure decisions are motivated by

[1] Welch is not the first to raise the issue of capital structure inertia (see also, e.g., Fischer, Heinkel and Zechner (1989), Leland (1994), Samuelson and Zeckhauser (1988) or Shyam-Sunder and Myers (1999)). His primary contribution relative to the existing empirical literature on capital structure is not so much to pointing out the presence of inertia, but that it causes stock returns to become the primary driver of observed capital structure. Also, his approach allows to focus primarily on the quantitative, and not just on the qualitative dimension of capital structure inertia.

managerial self interest, by inquiring whether managers are willing and able to reduce the level of debt below that chosen by public investors. The underlying hypothesis is that managers prefer lower debt levels since debt represents a greater non-diversified risk to the management than to public investors. They show that the firms' debt level decreases as the shares held by the managers increase. Also, firms have a higher average debt ratio if they have large non-managerial stockholders.

Agrawal and Nagarajan (1990) investigate to what extent equity-financed and leveraged firms differ with respect to financial, managerial and ownership characteristics. Their results suggest that managers of all-equity firms have significantly larger stockholdings than managers of similar-sized leveraged firms in the same industry.

John and John (1993) study how design and mix of external claims issued by the firm affect the optimal management compensation structure. Their work provides a theoretical explanation for a parallel decrease in the pay-to-shareholder-wealth sensitivity of a firm's managerial compensation and the level of debt and the complexity of capital structure, an effect which has been documented in existing empirical studies.

Lyandres (2001) shows that executive compensation can substitute for debt in committing managers to a certain strategic behavior. His empirical results reveal that incentive based compensation can be explained by leverage, growth options and size of the firm as well as by industry competitiveness.

We extend Welch's (2002) framework by integrating characteristics of the firms' executive compensation. Using a dynamic panel data model to investigate to what extent capital structure inertia can be explained by the structure of executive compensation, we compute three variables to measure the strength of incentives for CEOs and use dynamic panel data estimations to relate them to the firms' capital structure choice. In addition, we look at the relationship between capital structure inertia and firm performance as well as the importance of transaction costs. Our sample is comprised of US firms in manufacturing industries over the time period from 1992 to 2000.

From our analysis we find evidence for the existence of capital structure inertia in our sample. Our results provide empirical support for the hypothesis that capital structure inertia can, at least partly, be explained by certain characteristics of executive compensation. The stronger the incentives for executives are, the more actively do the firms adjust their capital structure. This finding is consistent with agency theory. We also show that firms with higher capital structure inertia suffer from lower performance. Finally, our results raise some methodological doubts about the validity of the common empirical capital structure models.

The innovative aspect of the paper is that it combines for the first time the problem of capital structure inertia with the structure of executive compensation. In addition, it improves Welch's estimation method by applying a dynamic panel data estimator which is more appropriate for the data structure in overcoming the potential inconsistency problem of OLS. We see this paper as a further contribution to the growing literature on the interplay between capital structure and executive compensation.

The paper is structured as follows: Section 2 describes the empirical model used to measure capital structure inertia. Section 3 outlines the relevant features of executive compensation and their links to capital structure. Section 4 contains the data description. The analysis is in section 5, and the conclusion in section 6. Some supplementary statistics can be found in the appendix.

2 The model for measuring capital structure inertia

Based on Welch (2002), we consider the following model for measuring capital structure inertia. Let the actual or current debt ratio adr_{it} of firm i in year t be defined as the ratio of long-term debt (Compustat item [9]) and current liabilities [34] d_{it} over the sum of long-term debt and current liabilities d_{it} and the market value of equity e_{it} ([25]*[199]), i.e., [2]

$$adr_{it} = \frac{d_{it}}{d_{it} + e_{it}} * 100 \tag{1}$$

When firm i neither issues nor retires debt or equity, i.e., when it does not optimize its capital structure, the firm's stock valuation is the main determinant of its debt ratio. This behavior is captured by the inert debt ratio $idr_{it-1,it}$ as given by (2), where $r_{it-1,it}$ is the external stock return from $t-1$ to t.

$$idr_{it-1,it} = \frac{d_{it-1}}{d_{it-1} + e_{it-1}(1 + r_{it-1,it})} * 100 \tag{2}$$

[2] Besides the current debt ratio, we also look at other debt ratios such as the short term, long term and convertible debt ratio. Results are in the appendix.

$idr_{it-1,it}$ is the debt ratio that will result if the firm does nothing. By construction, the inert debt ratio moves with changes in equity value but is not affected by managers' capital structure decisions.

We estimate a model where the current debt ratio adr_{it} is a function of its lagged value adr_{it-1} and the inert debt ratio $idr_{it-1,it}$, i.e.,

$$adr_{it} = \alpha_0 + \alpha_1 adr_{it-1} + \alpha_2 idr_{it-1,it} + \eta_i + \gamma_t + u_{it} \tag{3}$$

$$i = 1, .., N_j \text{ and } t = 1, ..T_i$$

where i is the firm index and t is the time index. The inclusion of the lagged debt ratio as explanatory variable allows for endogenous persistence. η_i depicts the unobservable firm-specific effect and takes into account possible heterogeneity for which we do not explicitly control. γ_t stands for the time specific effects[3]. Finally, u_{it} is the remainder disturbance, with $u_{it} \sim IID(0, \sigma_u^2)$ independent of each other and among themselves.

This setup as given by (3) allows us to decompose the firms' conduct into a readjustment behavior, which is returning to its previous debt ratio, and into an inert behavior. In the case that the firm completely readjusts to its former debt ratio, we expect α_1 to be greater than or equal to one and α_2 to be less than or equal to zero. On the other hand, when firms are completely inert, α_2 is equal to one and α_1 is zero. Accordingly, the smaller α_1 and the larger α_2, the more inert the firms are. We can formulate the hypotheses as follows:

$$\text{Readjustment hypothesis} : \alpha_1 \geq 1, \alpha_2 \leq 0 \tag{4}$$

$$\text{Inertia hypothesis} : \alpha_1 = 0, \alpha_2 = 1 \tag{5}$$

The standard approach taken by empirical capital structure studies consists of regressing a firm's debt ratio on a set of explanatory variables derived from different theories of capital structure . The typical capital structure determinants include firms' collateral value of assets, size, non-debt tax shields, profitability, growth opportunities, uniqueness captured by the relative importance of their R&D or sales expenses, taxes,

[3]The time-specific effects may capture factors like macroeconomic variables or other conditions which affect all firms in the same way.

volatility of earnings as well as debt constraints which limit the firm in adjusting its capital structure. A detailed description of these capital structure determinants can be found in the appendix.

In order to assess the validity of the standard capital structure approach and to see the effect of the inert debt ratio, we also estimate the variations of the model given by equation (6), where X_{it-1} is a vector of standard capital structure determinants lagged by one period as mentioned above, and adr and idr are defined as before.

$$adr_{it} = \alpha_0 + \alpha_1 adr_{it-1} + \alpha_2 idr_{it-1,it} + X_{it-1}\beta + \eta_i + \gamma_t + u_{it} \tag{6}$$

3 Capital structure inertia and executive compensation

The capital structure of a firm is not only determined by internal and external factors which reflect concerns of risk and control, but also bythe preferences of their managers, which may play an important role. This perspective is known as the strategy-capital structure relationship.[4] There is, however, a managerial incentive problem, which stems from the fact that the decisions of the managers are influenced by their personal wealth considerations.

Based on agency theory, several theoretical and empirical studies have suggested that managers, with their non-diversified human capital invested in the firm, have incentives to reduce their non-diversified employment risks by ensuring the continued survival of the firm.[5] Typical incentives schemes to align the managers' interests with those of the firm owners include cash compensations, stock option awards and ownership shares of the firm as compensation mechanisms.[6]

In what follows, we are interested in the incentive problem with respect to the firm's capital structure choice, and more specifically how this is related to capital structure inertia. Our main hypothesis is that less inert firms are, the stronger the incentives for their executives are.

We consider four variables used to measure the strength of incentives for executives:

[4] See Barton and Gordon (1988).
[5] See, e.g., Amihud and Lev (1981).
[6] See, e.g., Kedia (1998).

(1) option share of total compensation, (2) pay-performance sensitivity, i.e., the extent to which compensation is tied to changes in the market value of the firm, (3) the extent of the variable compensation component, and (4) firm ownership by the CEO.

3.1 Stock options granted relative to total compensation

Stock options are the right to buy stocks at a predetermined price in the future. They are typically awarded to align CEO incentives with those of the shareholders in order to reduce the agency conflict.[7] Stock option awards also provide incentives against short-termism among managers.

The variable opt_share_{it} measures the value of stock options granted to the executive during the year as valued using S&P's Black Scholes methodology relative to the total compensation, i.e,

$$opt\_share_{it} = \frac{blk\_value_{it}}{tcc_{it}} * 100 \tag{7}$$

where blk_value_{it} is the value of stock option grants to the CEO[8] and tcc_{it} is the total current compensation, which includes the base salary (cash and non-cash) and bonus. The higher the option share relative to the total compensation, the more executives are expected to act in the interests of shareholders, and the higher is the strength of their incentives.

Following Kedia (1998), we need to control for a number of factors. Managers tend to have more private information about the firm's projects in firms with high growth opportunities. Given this information asymmetry, it is also more difficult to evaluate the manager's performance, and thus stock options are more often used in this kind of environment. The firm's growth opportunities are approximated by the variable q, which is similar to Tobin's q[9].Furthermore, it is argued in the literature that firms facing higher liquidity constraints and lower marginal tax rates are more likely to use stock options as CEO compensation. Stock options do not result in an expense against income and, therefore, do not absorb liquidity.[10] We use the dummy variable liq_c_{it} to

[7] See, e.g., Haugen and Senbet (1981).

[8] The value is calculated while using the Black Scholes formula.

[9] Our proxy for growth opportunities q is defined as $q_{it} = [assets_{it} + (mktval_{it} - bookval_{it})]/assets_{it}$.

[10] See Matsunaga, Shevlin and Shores (1992). They also argue that managers of firms with higher

measure liquidity constraints. It takes the values one if the firm does not pay a dividend in the current year and zero if it does. Given the considerations on firm performance and transaction costs in relation to capital structure inertia, we include the return on assets roa_{it} and firm size $size_{it}$ as additional control variables in a second specification.

3.2 Pay-performance sensitivity

The dollar change in CEO wealth per dollar change in firm value, which is also called the compensation elasticity $comp\_el_{it}$, is a common strength of incentive measure.[11] It measures the extent to which the executive's compensation changes relative to a change in the firm's market value, i.e.,

$$comp\_el_{it} = \frac{tdc1\_pct_{it}}{mktval\_pct_{it}} \tag{8}$$

where $tdc1\_pct_{it}$ is the change in total compensation, which includes total current compensation tcc_{it} plus total value of stock options granted, and $mktval\_pct_{it}$ is the change in market value of common stock from year $(t-1)$ to t. The higher the compensation elasticity $comp\_el_{it}$, the higher the strength of incentives.

The pay-performance sensitivity is a function of firm size. Jensen and Murphy (1990), for instance, find higher compensation elasticities for smaller firms. This empirical observation reflects the fact that the variance of shareholder wealth is larger for large firms and therefore, the risk associated with a given pay-performance sensitivity is also higher for the CEO of a large firm. The decrease of the pay-performance sensitivity with firm size implies that the value of providing incentives for effort does not increase with size as fast as the cost of risk bearing by the executive.[12] Accordingly, we again include firm size $size_{it}$ as a control variable. In a further specification, we again add the return on assets roa_{it} to control for firm performance.

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financial reporting costs (i.e., who are closer to violating bond convenants due to lower reported earnings) choose accounting measures which result in higher reported earnings and should therefore be compensated with more stock options. The reporting costs can be approximated by the ratio of income available for interest payments to interest expense. Due to insufficient observations we do not include this variable.

[11] See, e.g., Jensen and Murphy (1990) .

[12] See Schaefer (1998), and Baker and Hall (1998).

3.3 Variable compensation share

We build the ratio of variable compensation over total compensation to measure the extent to which the total compensation of the executive is variable, i.e.,

$$var\_comp_{it} = \frac{tdc1_{it} - salary_{it}}{tdc1_{it}} * 100 \tag{9}$$

where $tdc1$ is the total current compensation including the base salary (cash and non-cash), bonus and total value of stock options granted.
The larger the variable part of the compensation, the stronger are the incentives for the executive. To control for firm performance and transaction costs, we again include return on assets roa_{it} and firm size $size_{it}$ as additional control variables in a second specification.

3.4 CEO firm ownership

It is widely recognized that the structure of equity ownership has important effects on managerial incentives and firm value.[13] Letting executives own part of the firm is one way to align their interests with those of the owners. We measure CEO firm ownership $shrownpc_{it}$ by the percentage of the company's shares which the CEO owns, i.e.,

$$shrownpc_{it} = \frac{shares\ owned\ by\ CEO}{total\ number\ of\ shares} * 100 \tag{10}$$

Typically, the size of the firm is related to its ownership concentration.[14] When a firm grows, managers are likely to have a lower share due to wealth constraints and efficient risk bearing. Therefore, we include $size_{it}$ as an additional variable, which we again measure by the natural logarithm of total assets. We also control for the volatility of the stock market returns bs_volat_{it} and the price of the shares at the end of the fiscal year $price\_close_{it}$ since they may affectexecutive shareownership as well. Finally, we again include the return on assets roa_{it} in a second specification to control for firm performance.

[13] See, e.g., Jensen and Meckling (1976), Fama and Jensen (1983), or Shleifer and Visny (1986).
[14] See Demsetz and Lehn (1985).

4 Data and descriptive statistics

4.1 The sample

Our sample contains firms in manufacturing industries, North American Industry Classification system (NAICS) 31 to 33, listed in the Compustat Executive Compensation database over the years 1992 to 2001. We restrict our analysis to manufacturing industries since executive compensation schemes may differ significantly in other industries.[15] All series are converted to real values in 2001 dollars using the consumer price index (CPI) inflation series. The data include active as well as inactive firms, and we retain the firm-years in which the variables used in the regressions are not missing. The compensation figures refer to the remuneration of the CEO.

We combine the information on CEO compensation with the balance sheet and profit and loss account data taken from the Compustat Industrial database. The basic data set contains 1384 firms for which we have up to 9 years of observations. Due to missing data, there are, however, fewer observations for most of the variables. Table 1 shows descriptive statistics for the main variables.

[insert table 1 about here]

5 Analysis

The analysis proceeds in three steps. First, we examine whether there is evidence for capital structure inertia in our sample. This analysis allows us to assess the validity of standard capital structure theories at the same time. In a second step, we discuss the relationships between capital structure inertia and firm performance as well as the role of transaction costs. Finally, we investigate our main hypothesis as to whether capital structure inertia can be explained by the structure of executive compensation.

5.1 Does capital structure inertia exist?

To see whether the standard capital structure determinants have some explanatory power or whether past stock returns are the primary determinants of the market-based

[15] (e.g., banking, insurance) mention paper which states that.

debt ratio, we estimate variations of the model given by (6) with instrumental variables using the GMM dynamic panel data estimator as proposed by Arellano and Bond (1991). Due to the inclusion of the lagged dependent explanatory variable and its potential correlation with the error term, habitual panel data estimation procedures such as fixed or random effects are asymptotically valid only when the number of observations in the time dimension becomes large.[16] As an additional advantage, the instrumental variables approach solves problems of simultaneity bias between the leverage measure and its explanatory variables, and it controls for other potential biases such as unobserved heterogeneity and measurement errors.

For all the following estimation results we consider the explanatory variables to be predetermined and instrument them by their lagged values up to the second lag. This procedure eliminates the problem of endogeneity of regressors. To correct for heteroskedasticity of u_{it}, we compute the robust standard errors, which are again given in brackets below the coefficients.[17]. The GMM estimator is consistent in case there is no second-order autocorrelation in the first-differenced idiosyncratic errors. We report the z_2 statistics, which follow a $N(0,1)$ distribution under the null hypothesis, to test for no second order autocorrelation.. The Wald statistic, which is distributed as χ^2, tests for the joint significance of the included explanatory variables. Finally, the Sargan test of over-identifying restrictions is asymptotically distributed as χ^2 under the null of instrument validity. It jointly tests for the model specification and the validity of the instruments. However, the Sargan test rejects too often when there is heteroskedasticity in the data.[18]

[insert table 2 about here]

The second column of Table 2 reports the GMM estimates of model (6), i.e. without inclusion of the inert debt ratio $idr_{it-1,it}$ but with the standard capital structure determinants as explanatory variables. Besides the lagged debt ratio, no coefficient is statistically significant, even though most of the coefficients of the standard capital structure determinants carry the expected sign. Obviously, the current debt ratio is

[16] Further explanations about estimating dynamic panel data models can be found in the appendix.

[17] We tested for panel heteroskedasticity and found evidence for it.

[18] The Sargan test statistic is taken from the two-step estimator since it is not reported for the one-step estimator with robust standard errors.

best explained by its lagged value. Once we include the inert debt ratio, as reported in the third column of Table 2, the lagged debt ratio loses its significance, and the inert debt ratio is the only significant determinant. This means, for instance, that a firm, on average, does not increase its leverage when its fixed assets ratio increases, or it does not lower its leverage when it becomes more profitable, as predicted by economic theory.

For a robustness check and comparability with Welch's (2002) paper, we also estimate the model specifications with OLS. It allows us to investigate the effect of not including the lagged dependent variable as a regressor. In contrast to the panel data specification, the pooled OLS regressions, where each firm-year is one observation, does not control for unobserved firm-specific heterogeneity.

The third column of table 2 reports the results from estimating the model with OLS without including lagged and inert debt ratios. This corresponds to the standard approach in the literature. All the standard capital structure determinants are statistically significant, and except for tax shields *tax_ta* and debt constraints *debt_con* they also carry the expected sign. Once we include the lagged debt ratio, as is reported in the fifth column of table 2, however, all the coefficients except the fixed asset ratio fix lose their significance. Looking at the R^2, we observe that the explanatory power of the regression increases dramatically with inclusion of the lagged debt ratio. Estimating this type of model without including the debt ratio of the former period, which basically assumes that the current debt ratio does not depend on its past values, strongly affects the results.

Finally, we add the inert debt ratio as a right hand side variable, which is significant at the 1% level. Besides increasing the fit of the model by 10 percentage points, the lagged debt ratio almost loses its significance. Given these results, we conclude that the inert debt ratio seems to be the main capital structure determinant, and we use model (3) as our main specification.

Firms may behave differently with respect to increasing or decreasing their debt ratio. In order to see whether there is an asymmetry in the adjustment behavior, we split up the sample into two subsample depending on the sign of the change in debt ratio from period $(t-1)$ to t , i.e., whether $\Delta adr_{it} > 0$ or $\Delta adr_{it} < 0$, where

$\Delta adr_{it} = adr_{it} - adr_{it-1}$. [19] Similarly, we also split up the sample with respect to whether firms are over- or underleveraged. The optimal leverage is approximated by the fitted values of estimating equation (6) without lagged and inert debt ratio by fixed effects. We then test for the difference between the coefficients by two-sided means differences, whose significance level is reported in the table.

[insert table 3 about here]

As we can see from Table 3.a., there is indeed an asymmetry in capital structure inertia behavior depending on whether the firms' debt ratio increased or decreased from period $(t-1)$ to t. Given the significant lower coefficient of idr in the subsample with $\Delta adr_{it} > 0$ compared to the second subsample, firms tend to be more inert when lowering their leverage. Given the dimension of the debt ratios, which lie in the interval from 0 to 100%, even a small difference between coefficients has an economically significant impact. Note that the number of firms that increased, or respectively lowered their debt ratio does not differ very much.

Table 3.b. reports the results with respect to optimal leverage.We observe a more inert behavior of firms which are overleveraged according to standard capital structure theories. This is agai reflected in a higher and significant coefficient of idr in the overleveraged subsample. Interestingly, the overleveraged firms form a clear majority.

5.2 Capital structure inertia and firm performance

So far, we have observed that firms do not adjust their leverage according to the well-known theories of capital structure. We do, however, not know whether such behavior is good or bad. It is possible that our empirical specification, which is based on static capital structure theories, does not incorporate all the relevant factors which may matter in a dynamic analysis of capital structure. In order to qualify the existence of capital structure inertia, we analyze the relationship between the inertia behavior and performance of the firm.

We use the return on assets roa, return on equity roe, a variable similar to Tobin's q[20], profitability as well as earning per share to measure operating and market perfor-

[19] The difference between the total number of observations and the sum of the two subsamples is due to the cases for which $\Delta adr_{it} = 0$.

[20] See definition in section 3.1.1.

mance of the firm. There is an ongoing debate in the literature on whether (Tobin's) q or the roa are correct proxies for firm performance. While Tobin's q is difficult to measure, it is also often considered as a proxy for the firm's growth opportunities rather than its performance. On the other hand, the return on assets and other accounting rates of return do not necessarily reflect the economic profit of the firm. An important argument for using the roa is that this measure is highly relevant for executive compensation decisions.[21] We include the return on equity also to have a performance measure of the equity stake.

We estimate model (3) again by GMM. We split up the sample depending on whether the firm-specific value of the performance criterion is higher or lower than the sample median in the same year[22] and test for significance of the difference.

[insert table 4 about here]

As we can see from table 4, firms with relatively high returns on assets, high returns on equity, high profitability and high earnings per share are clearly less inert than the one with the relatively lower performance. This is reflected in a higher coefficient of adr_{it-1} and a lower coefficient of $idr_{it-1,it}$. These results are also robust with respect to the alternative profitability measure profit over sales instead of reported profit over total assets, for which we do not report the results. On the other hand, firms with higher q_{it} ratios, which reflect a larger growth potential, do not seem to differ significantly from each other with respect to the inert debt ratio. For the robustness check, we use the mean instead of the median for splitting up the sample. In addition, we estimate the models with OLS. The results are very similar to the ones reported in table 4.

Even though we do not control for other factors which might affect the firm's profitability, we can conclude that firms with a higher performance are less inert with respect to their capital structure choice.

5.3 Do transaction costs matter?

In the presence of transaction costs for issuing or retiring debt, firms rebalance their debt ratio only after it crosses an upper or a lower limit. Transaction costs consists

[21] See also Mehran (1995).

[22] We choose the median instead of the mean because of the rather skewed distribution of some variables.

of a variable cost component which is proportional to the market value of raised or retired debt. In addition, there is also a fixed cost, which is independent of the size of the transaction.[23] Due to the fixed cost component, it is commonly argued that smaller firms face relatively higher transaction than larger firms.[24] Accordingly, we would expect smaller firms to adjust their capital structure less frequently. Graham and Harvey (2001), however, find only moderate evidence that transaction costs matter for debt issuance, especially for small firms. Welch (2002) provides some so called back-of-the-envelope computations to show that financial transaction costs may only explain part of the inertia behavior.

We investigate the role of transaction costs for capital structure inertia by splitting up the sample into two subsamples depending on whether the firms are smaller or larger than the median firm in the same year. We then run regression (3)for both subsamples and test again for significance of difference between the coefficients. Besides size, we consider the volatility of stock market valuations as another proxy for transaction costs. Volatile firms may face larger transaction costs and are, therefore, expected to adjust their capital structure less frequently.

[insert table 5 about here]

Table 5 shows that the smaller firms with supposedly higher transaction costs are indeed more inert with respect to their capital structure choice compared to larger firms. Also, more volatile firms seem to face higher costs of capital structure adjustment. The results are robust when the sample is split up according to the mean as well as when we use OLS as estimation method. These findings are also important for the choice of control variables discussed in the next subsection, where we investigate how the structure of executive compensation affects the firms' inertia behavior.

5.4 Capital structure inertia and executive compensation

Given our discussion above, we claim that capital structure inertia can at least partly be explained by the structure of executive compensation. Our main hypothesis is that

[23] See, e.g., Tittman and Tsyplakov (2002) for a dynamic capital structure model with variable and fixed transaction cost.

[24] Tittman and Wessels (1988), for instance, interpret the finding that small firms use relatively little debt as evidence that transaction costs discourage debt usage among small firms.

firms are less inert with respect to their capital structure when their executives face the prospect of stronger incentive schemes.

As outlined in section 3, we use four measures to approximate the strength of incentives for CEOs, namely option share, compensation elasticity, variable salary component and shareownership. We interpret a higher value of these measures as stronger incentives for the CEOs.

For each of these measures, we separately estimate model (3) by GMM. While doing so, we split up the sample into two subsamples according to whether the firm-specific observation of this incentive measure is lower or higher than the sample median of the same year. For robustness check we use the mean instead of the median as split-up criterion.

[insert table 6 about here]

Table 6.a. reports the results for the incentive measure option share opt_sh_{it}. Remember that according to our empirical model for measuring capital structure inertia, firms are more inert, the smaller the coefficient of adr_{it-1} and the larger the coefficient of $idr_{t-1,t}$. The firms in the subsample with the relatively low option share are clearly more inert: The coefficient on the lagged debt ratio adr_{it-1} is smaller and the one on the inert debt ratio $idr_{t-1,t}$ is larger than in the subsample with the higher option share. The differences are statistically significant at the 1% level. This picture is confirmed when including size and return on assets as additional controls. Even though the differences are not as large as before, they are still significant at the 1% level.

For robustness check, we estimate the relationships by using the year-specific sample mean instead of the median to split up the sample. Our findings are fully confirmed.

The results for our second incentive measure, are shown in Table 6.b., where we investigate whether a higher compensation elasticity $comp\_el_{it}$ provides proper incentives for a more optimal or at least more active capital structure choice. Our results show that firms that tie the compensation of their CEO closely to changes in the firm's market value are indeed less inert as well. We report a significantly lower coefficient of adr_{it-1}, and a higher coefficient of $idr_{t-1,t}$ in the subsample with the firms having a lower compensation elasticity. The difference between the two subsamples remains as great even after including the control for firm performance roa_{it}. The robustness check with the mean instead of the median as sample split up again confirms our results.

We find a similar picture when repeating the exercise for the incentive measure variable salary component var_sal_{it}. The results are outlined in Table 6.c. The firms in the subsample with lower variable salary exhibit a stronger resistance to adjusting their capital structure, which is again reflected in the lower coefficient of adr_{it-1} and the higher coefficient of $idr_{t-1,t}$. The robustness checks with the additional controls $size_{it}$ and roa_{it} do not change our findings, even though the differences become smaller from an absolute point of view. However, they are still significant at the 1% level.

Finally, we investigate the role of shareownership by the CEO for capital structure inertia. As we can see from Table 6.d., we do not find less capital structure inertia when CEOs own more shares in the firm. The coefficients of $idr_{t-1,t}$ do not significantly differ from each other in either subsample, and the coefficients on the lagged debt ratio even provide weak evidence for more inertia in firms where CEOs have a higher equity stake. This finding persists when including our additional control variables, as well as when using the mean for the sample split up.

At first glance, this finding appears somewhat puzzling. However, CEOs own on average 6% of the company shares, which is relatively little. Accordingly, the incentive effect of this mechanism may be rather weak in this context. Also, the capital structure inertia considered in this paper reflects a short-run behavior. It is possible that shareownership has a more sustainable effect in the longer run.

To summarize, we find that firms where CEOs are compensated with relatively more option shares, where their compensation is more closely tied to the firm's market value and where the variable salary component is greater are less inert with respect to their capital structure choice. We interpret these findings as evidence for our main hypothesis that stronger incentive schemes for executives lead to less capital structure inertia. Accordingly, the structure of executive compensation may play in the better understanding of capital structure inertia behavior of firms.

6 Conclusions

This paper provides further evidence for the claim that firms may fail to adjust their capital structure according to the well-established capital structure theories. Based on agency theory, we argue that capital structure inertia behavior is related to the structure of the executive compensation. The stronger the incentives for CEOs, the less inert the firms are with respect to their capital structure choice. We also investigate the relationships between capital structure and various measures of firm performance and find that inertia tends to be negatively correlated with firm performance. Finally, we also explore the explanatory power of transaction costs, which are a common explanation for capital structure inertia. Even though they may play a certain role, they cannot be counted as a main determinant of capital structure inertia.

Additional research is needed for a more complete understanding of this topic. Assuming that capital structure inertia is related to agency problems within the firm, we can think of other factors which might possibly affect firms' inertia behavior. Besides the direct contractual provisions between owners and managers of the firm, there are competitive market mechanisms where discipline is induced by capital-, labor- and product markets. The intensity of product markets, for instance, acting as a substitute mechanism for firm-internal compensation schemes, may affect firms' inertia behavior. The fact that we also find significant inter-industry differences with respect to capital structure inertia might provide some motivation for further investigations of this hypothesis.

Also, it is likely that the role and importance of these internal and external governance mechanisms vary over time with the changing macroeconomic environment. In a recession, for instance, managers may care more about efficiency in order to prevent possible liquidation of the firm. Some of these issues will be addressed in future work.

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7 Appendix

7.1 The standard capital structure determinants

There exists a large theoretical literature on how firms choose their optimal capital structure, and it has also been widely tested with firm data.[25] According to the literature, the following factors are usually considered as main capital structure determinants. All the ratios are expressen in percentages.

Collateral value of debt Firms with important fixed assets may obtain more favourable conditions to secure debt. First, it may be easier for the lender to assess the value of tangible assets compared to intangibles. Besides this problem of asymmetric information, there is a higher probability of intangible assets to loose value in case of a discovery, i.e., it may be easier to sell machinery than to obtain money for goodwill. We use the total amount of fixed assets [Compustat item 7] over total assets [Compustat item 6] to measure the importance of fixed assets of the firm, and expect a positive relationship between the importance of fixed assets and leverage (fix).

Firm size Larger firms are likely to have more diversified market portfolios and therefore face a lower probability of bankruptcy. As is further outlined by Titman and Wessels (1988), direct bankruptcy costs, which are fixed, constitute a smaller portion of firm value when the firm is larger. Accordingly, large firms may raise external capital at lower costs than smaller firms. This argument suggests a positive influence of the firm's size on its debt level. According to Rajan and Zingales (1995), however, there may be

[25] give some references

less asymmetric information about large firms, which decreases their need for external finance. We approximate the size of the firm by logarithm of its total assets [6] ($size$).

Non-debt tax shields According to Modigliani and Miller (1958), interest tax shields create strong incentives for debt issue. This holds, however, only when the firm has enough taxable income to justify debt. The tax advantage of debt decreases when other tax deductions like depreciation increase, which have a potentially negative effect on leverage. We build the ratio of depriciation and amortizations [14] plus investment tax credits [51] over total assets [6] to capture the importance of non debt tax shields ($shields$).

Profitability As Myers and Majluf (1984) point out, firms have a pecking-order in the choice of financing their projects. The least costly method is retained earnings, and they should, therefore, prefer internal to external finance. The more profitable a firm is, the lower is its need for external finance. However, when there is asymmetric information about the quality of the firms, the more profitable companies may signal their quality to the market with higher debt issue (Jensen 1986). We use the ratio of earnings before interest and taxes (EBIT) [13] over total assets [6] to measure the profitability of the firm ($profit\_ass$). In addition, we build the ratio of EBIT over sales [12] as an alternative profitability measure ($profit\_sal$).

Growth According to Titman and Wessels (1988), firms with greater growth opportunities have more possibilities to invest suboptimally and to be able to expropriate wealth from bondholders in favour of shareholders. Firms with higher exptected growth opportunities are expected to borrow less. We measure the growth potential of the firm by the relative change of total assets [6] from the previous year to the current ($growth\_ta$).[26]

Uniqueness According to Titman and Wessels (1988), the uniqueness of a firm may affect its capital structure. A more unique firm is expected to have a lower leverage.

[26] An alternative measure would be the ratio of book value of equity [60] over the market value of equity [data25∗data199].

We measure the uniqueness of the firm by the ratio of research&development expenses [46] over total sales [12] (*uniq_rd*).[27]

Tax shields Interest payments on debt are deductible from the bill. The tradeoff between tax svings and bancruptcy is the standard determinant in normative capital structure theory. We approximate tax shields as ratio of paid income taxes [317] over total assets [6](tax).

Volatility The more volatile a firm's equity and earnings, the higher is the probability of a bankruptcy from default on interest payments. Therefore, we expect more volatile firms to have lower debt levels. We approximate volatility by the the standard deviation of the rate of return on the stock (*volat*).

Debt constraints Following Welch (2002) we include the ratio of interest payments [15] over EBIT [13] to measure the extent to which firms have leeway in adjusting their capital structure (*debt_con*). The higher the debt constraints, the lower the expected leverage.

7.2 About estimating dynamic panel data models[28]

Consider a dynamic model for panel data, i.e.,

$$y_{it=}\alpha_0 + \beta y_{it-1} + \alpha_i + \varepsilon_{it}, \text{ with } i = 1, ..., N; t = 1, 3$$

In general, when a model for panel data includes lagged dependent explanatory variables, the habitual estimation procedures are asymptotically valid only when the number of observations in the time dimension (T) gets large. To remove the fixed effect, we difference the data to obtain

$$y_{i3} - y_{i2} = \beta(y_{i2} - y_{i1}) + (\varepsilon_{i3} - \varepsilon_{i2})$$

The problem arises from the failure of the assumption necessary for consistency, i.e.,

[27] An alternative measure would be the ratio of selling expenses [189] over sales [12].
[28] See also Arellano and Bond (1991), Ahn and Schmidt (1995) and Kiviet (1995).

$$E\left[(\varepsilon_{i3}-\varepsilon_{i2}) \mid (y_{i2}-y_{i1})\right]=-E\left[\varepsilon_{i2} \mid (y_{i2}-y_{i1})\right] \neq 0$$

First-differencing thus introduces correlation between the new error term and the differenced lagged dependent variable. The solution is to estimate the first-differenced equation by using instrumental variables (IV), where the instruments are the dependent variables lagged 2 periods or more. This method leads to consistent estimates (which, however, may not be efficient as it does not use all moment conditions).

In this particular case, the solution is to find an instrument uncorrelated with $(\varepsilon_{i3}-\varepsilon_{i2})$ and correlated with $(y_{i2}-y_{i1})$. The obvious candidate is y_{i1}, which is the dependent variable lagged twice y_{it-2}. The GMM estimator is a generalized version of this IV approach, with more than 2 periods and with predetermined right hand side variables.

Let us consider this generalized version: Consider again the following model, where we do not have a lagged dependent variable in the original model, i.e.,

$$y_{it=}\alpha_0+\beta x_{it}+\alpha_i+\varepsilon_{it} \text{ with } i=1,...,N; t=1,..,T$$

or

$$y_{it}=\alpha_0+\beta x_{it}+\alpha_i+u_{it}$$

Assume

$$E\left[\varepsilon_{it} \mid x_{iT},..,x_{it+1},x_{it},x_{it-1},..,x_{i1}\right] \neq 0$$

but

$$E\left[\varepsilon_{it} \mid x_{it},x_{it-1},..,x_{i1}\right]=0$$

To remove the effect, we difference the model, i.e.,

$$\Delta y_{it}=\beta \Delta x_{it}+\Delta u_{it}, i=1,..N; t=2,..T$$

In case x is predetermined, there is potential correlation between x_{it} and ε_{it-1}, and we have

$$E\left[\Delta u_{it} \mid \Delta x_{it}\right]=E\left[\varepsilon_{it}-\varepsilon_{it-1} \mid x_{it}-x_{it-1}\right] \neq 0$$

However,

$$E\left[\Delta u_{it} \mid x_{it-1},x_{it-2},..,x_{i1}\right]=0$$

which means that we can use all prior lags of x as instruments for the tth equation.

Note that the inclusion of y_{it-1} as regressor can be either due to the fact that modelling a dynamic relationships usually requires inclusion of a lagged dependent explanatory variables, or it may be the result of the first-differencing in order to remove unobserved effects. The problem of unobserved individual effects is their possible correlation with included exogenous variables. Accordingly, GLS error component technique cannot be used. Time-specific unobserved effects can be removed by using time dummies. Firm-specific unobserved effects can be eliminated by first-differencing the equation. An alternative transformation to first differencing is the fixed effect treatment of the model, which leads to the within estimator (least squares after transformation to deviations from mean). However, this transformations also introduces the lagged dependent variables as RHS variable, causing a correlation between the transformed lagged dependent variable and the transformed error term, i.e., the within estimator is inconsistent because it induces a correlation of order 1/T between the lagged dependent variable

and the error.

Table 1. Descriptive statistics

Definitions of variables:
adr$_{it}$=(d_{it}+e_{it})/e_{it}, where d_{it}=(longterm debt+current liabilites) and e_{it}=(longterm debt+current liabilites+market value of equity); *idr*=$d_{it-1}/(d_{it-1}+e_{it-1}(1+r_{it-1,it})$, where $r_{it-1,it}$ is the external stock return from *(t-1)* to *t*; *fix*=fixed assets over total assets; *size*=log(total assets); *shield*=depriciation and amortizations plus investment tax credits over total assets; *profit_ta*=EBIT over total assets; *growth_ta*=relative change of total assets from year (*t-1*) to *t*; *uniq_rd*=research&development expenses over sales; *tax_ta*=paid income taxes over total assets; *volat*=the standard deviation of the rate of return on the stock; *debt*_con=interest payments over EBIT; *roa*=return on assets; *roe*=return on equity; *q*=[total assets+(market value of equity-book value of equity)]/total assets; *eps*=earnings per share; *opt_sh*=(*blk_value*/*tcc*), where *blk_value*=value of stock option grants to CEO; *tcc*$_{it}$=total current compensation including base salary plus bonus; *liq*=*liquidity constraints* which takes the value of one if the firm did not pay a dividend in the last year and zero else; *comp_el*= %change of *tdc*/ %change *mktval* from year *(t-1)* to *t,* where *tdc*=total compensation (*tcc* plus options exercised) and *mktval*=market value of common stocks; *var_sal*=(*tdc-salary)/tdc*; *shrownpc*=% of company's shares owned by CEO; *price_close*$_{it}$ =price of the stock at the end of the fiscal year. The sample contains firms in the Compustat database over the years 1992 to 2001. All the series are expressed in $ of 2001. The ratios are expressed in %.

abbreviation	description	Mean	Std. Dev.	Min.	Qrt1	Median	Qrt3	Max	N
adr	actual debt ratio	20.334	19.918	0	3.361	15.075	31.274	99.904	3627
idr	inert debt ratio	19.307	19.527	0	2.896	13.906	29.283	99.898	3627
fix	collateral value of debt	56.393	32.739	0	31.959	50.619	74.627	100	3623
size_ta	firm size	11.354	1.509	5.815	10.297	11.172	12.262	17.199	3627
shield	non-debt tax shields	4.746	2.804	0.291	3.251	4.439	5.708	58.945	2197
profit_ta	profitability	14.449	14.918	-253.362	11.027	15.499	20.513	96.509	3618
growth_ta	growth	21.728	47.632	-80.854	2.903	10.970	25.537	726.135	3627
uniq_rd	uniqueness	25.563	208.299	0	1.385	3.693	10.285	7690.038	2647
tax_ta	tax shields	3.432	3.929	-25.726	1.233	3.201	5.254	35.021	3626
volat	volatilitiy	0.408	0.185	0.121	0.272	0.359	0.504	1.841	3435
debt_con	debt constraints	5.928	513.451	-29715.15	2.992	9.300	17.813	3869.935	3449
roa	return on assets	4.052	17.196	-388.316	2.291	6.016	9.782	57.469	3626
roe	return on equity	11.413	113.015	-2399.735	6.042	13.399	19.821	3038.983	3626
q	proxy for Tobin's *q*	232.413	216.437	49.413	124.429	165.398	248.919	3911.903	3626
eps	earnings per share	130.899	194.491	-3312.335	59.270	124.541	206.035	1672.73	3334
opt_sh	option share	34.876	28.007	0	8.269	32.637	55.444	100	3329
liq	liquidity	0.411	0.492	0	0	0	1	1	3627
comp_el	compensation elasticity	1.408	88.556	-4103.662	-0.661	0.379	1.790	1836.073	3309
var_sal	variable compensation share	65.537	23.071	0	53.528	70.927	82.516	100	3329
shrownpc	shareownership of CEO	6.021	9.047	0.007	0.763	2	7.3	53.8	1974
price_close	stock price end of fiscal year	32.152	22.821	0.02	16.25	26.75	42.688	218	3627

Table 2. Capital structure determinants

The table presents GMM (one-step estimator) and OLS estimates of the following regression:

$$adr_{it} = \alpha_0 + \alpha_1 adr_{it-1} + \alpha_2 idr_{it-1,it} + X_{it-1}\beta + \eta_i + \gamma_t + u_{it}\,.$$

idr and the variables in the vector X_{it-1} are considered as predetermined and instrumented by their lagged values up to the second lag.

Definitions of variables: $adr_{it}=(d_{it}+e_{it})/e_{it}$, where d_{it}=(longterm debt+current liabilites) and e_{it}=(longterm debt+current liabilites+market value of equity); $idr=d_{it-1}/(d_{it-1}+e_{it-1}(1+r_{it-1,it})$, where $r_{it-1,it}$ is the external stock return from *(t-1)* to *t*; The X_{it-1} vector contains the following variables: *fix*=fixed assets over total assets; *size*=log(total assets); *shield*=depriciation and amortizations plus investment tax credits over total assets; *profit_ta*=EBIT over total assets; *growth*=relative change of total assets from year (*t-1*) to *t*; *uniq_rd*=research&development expenses over sales; *tax_ta*=paid income taxes over total assets; *volat*=the standard deviation of the rate of return on the stock; *debt_*con=interest payments over EBIT. The sample contains firms in the Compustat database with non-missing observations for the relevant variables over the years 1992 to 2001. All the series are expressed in $ of 2001. The ratios are expressed in %. Robust std. errors in brackets. Time dummies and constant included. Sargan test from two-step estimator. Coefficients that are significantly different from zero at the 1%, 5%, and 10% level are marked with **, *, and $^{(*)}$ respectively.

adr_{it}	expected sign	GMM	GMM with $idr_{it-1,it}$	OLS	OLSwith adr_{it-1}	OLS with adr_{it-1} and $idr_{it-1,it}$
adr_{it-1}	+	0.285** (0.067)	0.021 (0.063)	-	0.962** (0.023)	0.081$^{(*)}$ (0.048)
$idr_{it-1,it}$	+	-	0.603** (0.071)	-	-	0.884** (0.043)
fix_{it-1}	+	-0.036 (0.086)	-0.125 (0.093)	0.055** (0.017)	0.024* (0.010)	0.022** (0.008)
$size\_ta_{it-1}$	+/-	3.625$^{(*)}$ (1.979)	1.484 (1.768)	2.054** (0.347)	0.117 (0.161)	-0.157 (0.120)
$shield_{it-1}$	-	0.129 (0.583)	0.484 (0.427)	-0.627** (0.204)	-0.197 (0.145)	-0.210 (0.136)
$profit\_ta_{it-1}$	+/-	0.017 (0.027)	-0.003 (0.024)	-0.195** (0.074)	0.016 (0.038)	0.046 (0.048)
$growth\_ta_{it-1}$	-	-0.010 (0.009)	-0.012 (0.010)	-0.019$^{(*)}$ (0.010)	0.003 (0.005)	-0.004 (0.004)
$uniq\_rd_{it-1}$	-	0.001 (0.004)	0.002 (0.004)	-0.049$^{(*)}$ (0.027)	-0.003 (0.006)	-0.001 (0.006)
tax_ta_{it-1}	+	0.101 (0.165)	0.170 (0.131)	-1.317** (0.210)	0.059 (0.111)	0.029 (0.119)
$volat_{it-1}$	-	-3.058 (7.614)	-6.543 (6.947)	-12.417** (3.837)	-0.536 (2.207)	-0.157 (1.557)
$debt\_con_{it-1}$	-	-0.019 (0.012)	-0.016* (0.007)	0.064** (0.025)	-0.011 (0.009)	-0.013** (0.005)
N		982	982	1556	1555	1555
Nb. of groups		350	350			
Wald χ^2/F		67.39	185.63	31.38**	247.58**	546.07**
R^2		-	-	0.27	0.76	0.86
z_2		0.06	0.35	-	-	-
Sargan test		204.96	220.32	-	-	-

Table 3. Capital structure inertia and adjustment asymmetries

The tables 3.a. and 3.b. present GMM estimates (one-step estimator) of the following regression:
$adr_{it} = \alpha_0 + \alpha_1 adr_{it-1} + \alpha_2 idr_{it-1,it} + \eta_i + \gamma_t + u_{it}$.
idr is considered as predetermined and instrumented by their lagged value up to the second lag. The sample is split up depending on whether the firm increased ($\Delta adr_{it} > 0$) or lowered ($\Delta adr_{it} < 0$) its leverage from year (*t-1*) to *t*, where $\Delta adr_{it} = (adr_{it} - adr_{it-1})$ and depending on whether the firm is overleveraged ($(adr_{it-1} - adr^*_{it-1}) > 0$) or underleveraged ($(adr_{it-1} - adr^*_{it-1}) < 0$) in period (*t-1*). The optimal debt level adr^*_{it-1} is the fitted value of the fixed effects estimation of $adr_{it-1} = \alpha_0 + X_{it-1}\beta + \eta_i + \gamma_t + u_{it}$, where X_{it-1} is the vector of capital structure determinants as outlined in table 2.
Definitions of variables: $adr_{it}=(d_{it}+e_{it})/e_{it}$, where d_{it}=(longterm debt+current liabilites) and e_{it}=(longterm debt+current liabilites+market value of equity); $idr=d_{it-1}/(d_{it-1}+e_{it-1}(1+r_{it-1,it}))$, where $r_{it-1,it}$ is the external stock return from *(t-1)* to *t*. The sample contains firms in the Compustat database with non-missing observations for the relevant variables over the years 1992 to 2001. All the series are expressed in \$ of 2001. The ratios are expressed in %. Robust std. errors in brackets. Time dummies and constant included. Sargan test from two-step estimator. Coefficients that are significantly different from zero at the 1%, 5%, and 10% level are marked with **, *, and $^{(*)}$ respectively; sig. indicates the significance level of the two-sided means difference test.

Table 3.a. Capital structure inertia and change in leverage

	increased leverage $\Delta adr_{it} > 0$	lowered leverage $\Delta adr_{it} < 0$	sig.
adr_{it-1}	$-0.065^{(*)}$	0.049	**
	(0.037)	(0.045)	
$idr_{t-1,t}$	0.512^{**}	0.682^{**}	**
	(0.063)	(0.053)	
N	1715	1629	
No. of groups	694	681	
Wald χ^2	168.91	187.08	
z_2	0.92	2.65	
Sargan test	79.23	57.61	

Table 3.b. Capital structure inertia and optimal leverage

	overleverage $(adr_{it-1} - adr^*_{it-1}) > 0$	underleverage $(adr_{it-1} - adr^*_{it-1}) < 0$	sig.
adr_{it-1}	-0.022	0.030	**
	(0.033)	(0.079)	
$idr_{t-1,t}$	0.672^{**}	0.218^{*}	**
	(0.054)	(0.094)	
N	2981	646	
No. of groups	793	261	
Wald χ^2	420.67	27.25	
z_2	0.75	0.34	
Sargan test	61.62	60.75	

Table 4. Capital structure inertia and firm performance

The table presents GMM estimates (one-step estimator) of the following regression: $adr_{it} = \alpha_0 + \alpha_1 adr_{it-1} + \alpha_2 idr_{it-1,it} + \eta_i + \gamma_t + u_{it}$. *idr* is considered as predetermined and instrumented by ist lagged value up to the second lag. The sample is split up according to whether the firm-specific performance measure is lower or higher than the year-specific sample median.
Definitions of variables: $adr_{it}=(d_{it}+e_{it})/e_{it}$, where d_{it}=(longterm debt+current liabilites) and e_{it}=(longterm debt+current liabilites+market value of equity); $idr=d_{it-1}/(d_{it-1}+e_{it-1}(1+r_{it-1,it})$, where $r_{it-1,it}$ is the external stock return from *(t-1)* to *t*; *roa*=return on assets; *roe*=return on equity; *q*=[total assets+(market value of equity-book value of equity)]/total assets; *profit_ta*=EBIT/total assets; *eps*=earnings per share.
The sample contains firms in the Compustat database with non-missing observations for the relevant variables over the years 1992 to 2001. All the series are expressed in $ of 2001. The ratios are expressed in %. Robust std. errors in brackets. Time dummies and constant included. Sargan test from two-step estimator. Coefficients that are significantly different from zero at the 1%, 5%, and 10% lever are marked with **, *, and $^{(*)}$ respectively; sig. indicates the significance level of the two-sided means difference test.

adr_{it}	low *roa*	high *roa*	sig.	low *roe*	high *roe*	sig.	low *q*	high *q*	sig.	low *profit_ta*	high *profit_ta*	sig.	low *eps*	high *eps*	sig.
adr_{it-1}	-0.059	0.104*	**	-0.068	0.046	**	-0.041	0.126$^{(*)}$	**	-0.047	0.091*	**	-0.112*	0.089$^{(*)}$	**
	(0.041)	(0.044)		(0.046)	(0.045)		(0.038)	(0.065)		(0.042)	(0.043)		(0.047)	(0.046)	
$idr_{it-1,it}$	0.753**	0.439**	**	0.726**	0.459**	**	0.678**	0.684**		0.726**	0.557**	**	0.720**	0.475**	**
	(0.064)	(0.070)		(0.076)	(0.066)		(0.059)	(0.078)		(0.064)	(0.073)		(0.072)	(0.060)	
N	1758	1864		1759	1862		1878	1745		1755	1859		1519	1804	
Nb. of groups	597	593		627	607		547	559		589	577		578	568	
Wald χ^2	437.25	107.93		303.62	131.07		555.34	124.80		385.70	142.01		197.84	251.97	
z_2	1.21	-0.70		0.47	-0.29		0.38	0.22		0.47	0.90		1.01	0.06	
Sargan test	62.73	78.84		54.94	68.44		49.48	65.50		43.64	66.00		48.32	53.77	

Table 5. Capital structure inertia and transaction costs

The table presents GMM estimates (one-step estimator) of the following regression:

$$adr_{it} = \alpha_0 + \alpha_1 adr_{it-1} + \alpha_2 idr_{it-1,it} + \eta_i + \gamma_t + u_{it} \; .$$

idr is considered as predetermined and instrumented by ist lagged values up to the second lag. The sample is split up according to whether the firm-specific characteristic such as size and stock market volatiltiy is lower or higher than the year-specific sample median.

Definitions of variables: $adr_{it}=(d_{it}+e_{it})/e_{it}$, where d_{it}=(longterm debt+current liabilites) and e_{it}=(longterm debt+current liabilites+market value of equity); $idr=d_{it-1}/(d_{it-1}+e_{it-1}(1+r_{it-1,it}))$, where $r_{it-1,it}$ is the external stock return from $(t-1)$ to t; *size*=log(total assets); *volat*=the standard deviation of the rate of return on the stock. The sample contains firms in the Compustat database with non-missing observations for the relevant variables over the years 1992 to 2001. All the series are expressed in \$ of 2001. The ratios are expressed in %. Robust std. errors in brackets. Time dummies and constant included. Sargan test from two-step estimator. Coefficients that are significantly different from zero at the 1%, 5%, and 10% lever are marked with **,*, and $^{(*)}$ respectively; sig. indicates the significance level of the two-sided means difference test.

adr_{it}	low *size*	high *size*	sig.	low *volat*	high *volat*	sig.
adr_{it-1}	-0.065	0.034	**	0.101*	-0.072$^{(*)}$	**
	(0.045)	(0.046)		(0.047)	(0.042)	
$idr_{it-1,it}$	0.720**	0.538**	**	0.448**	0.692**	**
	(0.088)	(0.055)		(0.057)	(0.071)	
N	1695	1927		1822	1603	
Nb. of groups	478	484		478	519	
Wald χ^2	124.85	309.05		247.22	149.30	
z_2	0.10	0.99		1.85	-0.87	
Sargan test	46.76	79.26		72.16	53.48	

Table 6. Capital structure inertia and executive compensation

The tables 6.a. to 6.d. present GMM estimates (one-step estimator) of the following regression: $adr_{it} = \alpha_0 + \alpha_1 adr_{it-1} + \alpha_2 idr_{it-1,it} + X_{it}\beta + \eta_i + \gamma_t + u_{it}$.

idr is considered as predetermined and instrumented by their lagged value up to the second lag. The sample is split up according to whether the firm-specific compensation characteristic option shares (*opt_sh),* compensation elasticity (*comp_e)l,* variable salary component *(var_sal)* and shareownership of the CEO (*shrownpc)* is lower or higher than the year-specific sample median.

X_{it} is a vector of control variables as described in the text.

Definitions of variables: $adr_{it}=(d_{it}+e_{it})/e_{it}$, where d_{it}=(longterm debt+current liabilites) and e_{it}=(longterm debt+current liabilites+market value of equity); $idr=d_{it-1}/(d_{it-1}+e_{it-1}(1+r_{it-1,it}))$, where $r_{it-1,it}$ is the external stock return from year *(t-1)* to *t*. $opt\_sh_{it}=(blk\_value_{it}/tcc_{it})$, where blk_value_{it}=value of stock option grants to CEO; tcc_{it}=total current compensation including base salary plus bonus; $comp\_el1_{it}$= %change of *tdc*/ %change *mktval* from year *(t-1)* to *t,* where tdc_{it}=total compensation (*tcc* plus options exercised) and $mktval_{it}$=market value of common stocks; $var\_com_{it}=(tdc_{it}-salary_{it})/tdc_{it}$; $shrownpc_{it}$=% of company's shares owned by CEO; q_{it}=[total assets+(market value of equity-book value of equity)]/total assets; liq_i=*liquidity constraints* which takes the value of one if the firm did not pay a dividend in the last year and zero else; *size*=log(total assets); roa_{it}=return on assets; bs_volat_{it}=std. deviation of the rate of return on the stock; $price\_close_{it}$ =price of the stock at the end of the fiscal year. The sample contains firms in the Compustat database with non-missing observations for the relevant variables over the years 1992 to 2001. All the series are expressed in $ of 2001. The ratios are expressed in %. Robust std. errors in brackets. Time dummies and constant included. Sargan test from two-step estimator. Coefficients that are significantly different from zero at the 1%, 5%, and 10% level are marked with **, *, and $^{(*)}$ respectively; sig. indicates the significance level of the two-sided means difference test.

Table 6.a. The role of option shares

adr_{it}	low *opt_sh*	high *opt_sh*	sig.	low *opt_sh*	high *opt_sh*	sig.
adr_{it-1}	-0.057	0.010	**	-0.118**	-0.036	**
	(0.043)	(0.047)		(0.043)	(0.041)	
$idr_{it-1,it}$	0.570**	0.384**	**	0.371**	0.302**	**
	(0.071)	(0.065)		(0.050)	(0.053)	
q_{it}	-0.001	-0.002		0.002	-0.001	
	(0.001)	(0.001)		(0.002)	(0.001)	
liq_{it}	2.207	6.153		6.299	8.295	
	(4.807)	(6.092)		(4.254)	(5.671)	
$size_{it}$	-	-		0.002	0.899	
				(0.002)	(1.131)	
roa_{it}	-	-		-0.094**	-0.047*	
				(0.029)	(0.022)	
N	1735	1591		1734	1591	
No. of groups	602	611		601	611	
Wald χ^2	208.13	94.91		228.87	100.45	
z_2	-0.40	0.11		-0.94	-0.21	
Sargan test	111.60	83.19		166.58	129.96	

Table 6b. The role of the compensation elasticity *comp_el:*

adr_{it}	low *comp_el*	high *comp_el*	sig.	low *comp_el*	high *comp_el*	sig.
adr_{it-1}	-0.103^{*} (0.047)	-0.058 (0.048)	**	-0.108^{*} (0.045)	-0.074 (0.045)	**
$idr_{it-1,it}$	0.448^{**} (0.062)	0.349^{**} (0.064)	**	0.414^{**} (0.054)	0.311^{**} (0.055)	**
$size_{it}$	-3.147 (2.043)	4.270^{*} (1.998)		-0.552 (1.704)	6.319^{**} (1.637)	
roa_{it}	-	-		-0.046^{**} (0.017)	-0.101^{*} (0.041)	
N	1625	1680		1624	1680	
No. of groups	698	686		697	686	
Wald χ^2	176.04	139.94		191.52	162.33	
z_2	0.17	-0.39		0.14	-0.56	
Sargan test	99.10	93.61		127.29	126.28	

Table 6c. The role of the variable salary component *var_sal*:

adr_{it}	low *var_sal*	high *var_sal*	sig.	low *var_sal*	high *var_sal*	sig.
adr_{it-1}	-0.061 (0.045)	-0.002 (0.052)	**	-0.144^{**} (0.042)	-0.062 (0.049)	**
$idr_{it-1,it}$	0.749^{**} (0.086)	0.384^{**} (0.060)	**	0.415^{**} (0.049)	0.289^{**} (0.051)	**
$size_{it}$	-	-		5.745^{**} (2.004)	0.254 (1.402)	
roa_{it}	-	-		-0.096^{**} (0.028)	$-0.062^{(*)}$ (0.034)	
N	1707	1621		1706	1621	
No. of groups	584	591		583	591	
Wald χ^2	207.14	145.20		208.79	147.05	
z_2	-1.19	0.61		-1.78	0.11	
Sargan test	39.16	70.83		113.28	112.71	

Table 6d. The role of the shareownership *shrownpc:*

adr_{it}	low *shrownpc*	high *shrownpc*	sig.	low *shrownpc*	high *shrownpc*	sig.
adr_{it-1}	-0.071 (0.048)	-0.137^{*} (0.060)	**	$-0.087^{(*)}$ (0.049)	-0.148^{*} (0.058)	**
$idr_{it-1,it}$	0.519^{**} (0.069)	0.517^{**} (0.077)		0.500^{**} (0.065)	0.498^{**} (0.072)	
$size_{it}$	1.572 (1.583)	2.662 (1.744)		1.878 (1.427)	$3.204^{(*)}$ (1.705)	
bs_volat_{it}	19.294^{*} (8.168)	-8.530 (11.677)		15.357^{*} (7.119)	-9.706 (10.650)	
$price\_close_{it}$	0.006 (0.019)	$-0.049^{(*)}$ (0.027)		0.004 (0.018)	$-0.044^{(*)}$ (0.025)	
roa_{it}	-	-		$-0.036^{(*)}$ (0.020)	-0.121^{*} (0.051)	
N	901	855		901	855	
No. of groups	347	242		347	242	
Wald χ^2	179.62	125.09		191.92	136.47	
z_2	-0.36	-0.03		-0.55	0.20	
Sargan test	132.78	135.71		150.55	151.45	