Ownership Structure and Executive Compensation in Germany

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Abstract

We analyze the relationship between the ownership structure and executive compensation in a sample of large listed German companies over the period from 1987 to 2003. Our findings suggest that executive compensation is a substantial fraction of corporate earnings and it reflects the existence of agency problems caused by the separation of ownership and control. Lack of control by ownership enables management to extract higher executive compensation. Identity of owners has a significant influence on the level of executive compensation. Whereas bank ownership substantially reduces the level of pay, family ownership has a significantly positive impact. The link between performance and compensation is dramatically weaker in firms where ultimate owners increase their voting rights in excess of their cash flow rights. The estimated pay-for-performance sensitivities are consistent with the view that concentrated owners have better opportunities for supervision.

1. Introduction

Much of what is known about executive compensation arises from analyses of firm level data from the USA and UK. These two countries are prominent examples of Anglo-Saxon corporate governance regimes where the main agency conflict is between a large number of shareholders and managers. In its idealized version managers own too little of the firm's shares and owners are too dispersed, so that managers can pursue their own interests which often deviate from those of the shareholders. Even though the recent "law and finance" literature suggests that these two countries offer the minority shareholders the strongest protection against expropriation, evidence on the determinants and effects of managerial investment and financing decisions points to severe deficiencies.[1]

Shleifer and Vishny (1997) survey the evidence on the existence and magnitude of agency costs and note that executive compensation contracts offer very limited incentives to solve this agency problem. Perhaps the most striking evidence on the weakness of compensation contracts comes from Jensen and Murphy (1990), who report that executive pay goes up by only $3.25 for every $1000 change in shareholder wealth. While more recent research has come up with higher pay-performance sensitivities, even the highest estimates do not indicate a substantial improvement over the earlier finding.[2] Combined with compensation levels that rank highest internationally[3], these figures suggest that compensation contracts are less than ideal means to solve the agency problem.[4] Overall these findings are more consistent with a managerial power approach than with the optimal contracting approach to executive compensation and they suggest that managers of large companies have sufficient discretion or power to design their own compensation contracts (Bebchuk et al., 2002 and Mueller and Yun, 1997).

There is now a fair amount of evidence that corporate governance in non-Anglo-Saxon countries offers the (minority) shareholders substantially weaker protections against expropriation. In these countries, most companies are controlled by a single large shareholder (La Porta, Lopez-de-Silanes, and Shleifer, 1999). Claessens, Djankov, and Lang (2000) report that a single shareholder controls more than two-thirds of East Asian companies and that the management is very often related to the family of the controlling shareholder. Faccio and Lang (2002) report similar fractions of continental European companies with a single large shareholder, who is also involved with the management. Controlling shareholders often establish control over their firms despite relatively small cash flow rights. Pyramidal structures, cross-ownership, dual-class shares and a rich variety of control-enhancing corporate charter provisions are devices that are commonly used to achieve this wedge.[5]

Existing empirical work suggests that deviations of control-rights from cash-flow rights distorts the incentives of large shareholders and leads to several inefficiencies from the point of view of minority shareholders including lower firm value (La Porta et al., 2002 and Claessens et al., 2002), lower dividends (Faccio et al., 2001 and Gugler and Yurtoglu, 2003), shareholder wealth reducing investment performance (Gugler, Mueller and Yurtoglu, 2004a) and inferior operating performance (Volpin, 2002).

There are only a few studies which analyze the relationship between corporate governance structures in non-Anglo-Saxon countries and executive compensation. The objective of this paper is to fill this gap by reporting on the relationship between executive compensation and corporate governance structures of a sample of German corporations. We do so by analyzing a panel dataset of German firms observed over the 1987-2003 period and document the following findings: First, we start by noting that average executive pay has increased considerably from 1987 to 2003. Second, we show that compared to firm performance, company size is a much more important determinant of the level of executive

compensation in Germany. Third, we find that agency problems caused by the separation of ownership and control exist because greater ownership concentration lowers the ability of executives to extract higher levels of compensation. We also find that block ownership by banks is associated with lower pay levels and ownership by families with higher pay levels than observed for other ownership categories. Fourth, considering the difference between direct vs. ultimate ownership, we find that increases in the size of companies are associated with higher levels of executive compensation when voting rights deviate from cash flow rights. More importantly, we also show that the link between performance and pay is dramatically weaker in companies where cash flow rights deviate from voting rights. Our last set of findings is concerning the relationship between changes in executive compensation and shareholder wealth. We find that in general the pay-for-performance sensitivity is negligibly small and that concentrated owners reduce it even further.

The paper is organized in the following way. Section two reviews the literature on the relationship between ownership and executive compensation. It also gives an overview of the prominent features of corporate governance in Germany and how they are related to executive compensation. Section three introduces our empirical approach and describes our data sources. Section four presents our main findings and the final section concludes.

2. Corporate Governance and Executive Compensation

As stated earlier, the main agency problem in Anglo-Saxon corporate governance systems, such as USA and UK is between dispersed shareholders and managers. Dispersed ownership of US firms allows the managers to pursue their own goals which can lead to several distortions including exorbitant pay levels and the lack of a strong pay-for-performance sensitivity.[6] Consistent with this argument, several papers have tested for the presence of a disciplining effect of concentrated ownership on the compensation of CEOs.

Stigler and Friedland (1983) found no relationship between ownership concentration and CEO compensation in a sample of 92 US companies for the period from 1937 to 1938. Santerre and Neun (1989) re-examined the same issue and found a negative relationship. Studies by Santerre and Neun (1986), Dyl (1988), and Goldberg and Idson (1995) also suggest that concentrated ownership results in lower pay levels of US CEOs. Two recent papers analyze the impact of institutional ownership on executive compensation in US companies. Hartzell and Starks (2003) find that institutional ownership is negatively related to the level of CEO compensation in a large sample of US firms observed over the period 1992-1997. More importantly, ownership by institutions positively affects the pay-for-performance sensitivity in their sample. Similarly, Clay (2000) documents an increase in equity performance sensitivities; however, he does not find a relationship between institutional ownership and the level of executive compensation. In contrast, in a study of UK companies, Cosh and Hughes (1997) report that institutional ownership has no impact to either the level of pay or the sensitivity of pay either to shareholder performance or size.

In contrast to large US and UK companies with their dispersed ownership structures, many of the largest German corporations exhibit concentrated ownership structures. Franks and Mayer (2001) report that out of 171 large corporations, 85% have a shareholder with at least 25%, and 57% have a shareholder owning more than 50% of the equity. Boehmer (2000) confirms that these figures are representative for all listed firms over the period 1985-1997. The classical conflict between managers and dispersed shareholders is therefore not pronounced, since large shareholders have substantial incentives and the ability to monitor the managers. Many studies, however, show that the benefits of large shareholders may be more than offset by the private benefits of control that are not shared by minority shareholders calling for legal protection of minority shareholders.

A dual board system is prescribed by law for German stock corporations (*Aktiengesellschaften* or *AG*s): The management board (*Vorstand*) is responsible for managing the enterprise. Typically, the management board consists of more than two full-time employed executives who are appointed by the supervisory board for a period of up to 5 years. The Chairman of the management board (*Vorstandsvorsitzender*), comparable to the CEO in the Anglo-American system, coordinates the work of the management board. The management board is the centre of corporate decision-making and is responsible for strategy formulation and implementation into day-to-day business. The management board reports at least once a year (usually three or four times a year) to the supervisory board about the current state and intended business policy of the corporation. The supervisory board (*Aufsichtsrat*) appoints, supervises and advises the members of the management board. The supervisory board has to monitor the activities of the management board. The chairman of the supervisory board coordinates the work of the supervisory board. The members of the supervisory board are elected by the shareholders at the General Meeting. The representatives elected by the shareholders and the representatives of the employees are equally obliged to act in the enterprise's best interests. Shareholders usually assemble once a year (*Hauptversammlung*) mainly to judge the work of the management board and supervisory board.

One of the special features of Germany is that banks control most votes of small shareholders via the proxy system. Edwards and Fischer (1994) and Gerum et al. (1988) show that the proxy system allows banks to have more seats in the supervisory boards than their direct shareholdings would imply. Due to their informational advantages, banks in Germany are potentially effective monitors but they will generally have little incentive to act on behalf of other shareholders since they are also debtors to the companies.[7] Thus, the question whether banks are effective monitors or not seems to be ultimately an empirical one.

Other important owner categories are non-financial companies (domestic or foreign) and holding companies. Non-financial companies control about 43% of listed companies at the direct level. Families have stakes in about 15% percent of all listed German companies (Boehmer, 2000). Ultimate ownership patterns in German corporations show that families are behind the non-financial companies at the direct level. Studies that analyzed the ownership pyramids in Germany show that 60% (Gugler and Yurtoglu, 2003) to 72% (Faccio and Lang, 2002) of listed firms are ultimately controlled by families.

Pyramids are the main vehicle through which cash flow rights deviate from voting rights in Germany. A family, bank or Company X owns a substantial or controlling interest in Company Y and has representatives on Y's supervisory board. Company Y in turn owns a controlling interest in Company Z, which in turn controls W, and so on. Companies Y, Z and W, on the other hand, do not own shares in the organizations that stand above them in the corporate pyramid. Provided that X has control[8] at all layers of the pyramid, we can measure her voting rights by using the last direct stake in pyramidal chain (*LS*). The corresponding fraction of cash flow rights (*CFR*), on the other hand, has to be calculated by multiplying the direct stakes at each layer of the pyramid.[9] A measure of the deviation of *CFR* from voting rights can be computed by using the ratio *LS* to *CFR*.

FitzRoy and Schwalbach (1990) is the first study to report a negative effect of ownership concentration on the compensation of managers in Germany. They look at the 1969-1985 period and employ the Herfindahl index of direct ownership. Schmid (1997) analyses the 1991 cross-section of a sample of 110 of the largest 120 listed German companies and documents that concentrated ownership, measured by the Herfindahl index, is negatively related to the compensation of highest rank managers (*Vorstand*) and supervisory board members. He also finds that ownership by banks has a positive impact on the level of

pay. According to Schmid (1997) this indicates that bank ownership insulates managers from effective disciplining. Ownership by families makes no appreciable difference on the level of both pay measures. In contrast to Schmid (1997), Elston and Goldberg (2003) find a negative impact of bank ownership on the level of compensation.[10] They analyze 91 companies over the 1970-1986 period and consistent with most of the other studies; they also find that concentrated ownership reduces the level of executive compensation in Germany.

3. The Empirical Model and Data Description

Empirical models of executive compensation generally consider variants of the following equation:

$$\ln(C_{it}) = \alpha_i + \beta P_{it-1} + \gamma \ln(S_{it-1}) + \lambda X_{it-1} + u_{it}, \quad i = 1, 2, ..., N; \quad t = 1, 2, ..., T. \qquad (1)$$

where C_{it} stands for executive compensation (salary plus bonus), P_{it-1} represents lagged performance of the company (Return on sales, assets, or share returns) and S_{it-1} is a measure of lagged firm size (sales, total assets, employees). X_{it-1} represents a vector of variables related to the ownership and control structures of firms. The stochastic error term u_{it} is assumed to have the usual properties.

The time-lag of one year is usually used assuming that executive compensation is determined by ex-post firm-specific measures. β can be thought of as a proxy for those factors that capture the relationship between pay and performance thereby revealing information about the managerial incentive contract. Since the parameter β is assumed constant, slope coefficient estimates are restricted to be constant across managers/companies, industries, and time periods. Thus, implicitly it is assumed that pay functions are homogeneous across corporations, industries, and time. As this need not be the case, we will

test the homogeneity assumption by performing regressions for different subgroups and time periods separately.

We further investigate the sensitivity compensation to shareholder wealth using the following equation

$$\Delta(managerial\ compensation)_{it} = a + b\Delta(shareholder\ wealth)_{it} + cX_{it} + \zeta_{it} \quad \textbf{(2)}$$

This specification depicts an intuitive link between executive compensation and shareholder wealth and it is used by many researchers.[11] Later on we estimate separate a and b coefficients for different ownership categories.

We take a stepwise approach. Starting with the full model (1) using all industries and time periods we then study heterogeneity between various industry groups by estimating regression equation (1) for each group separately. Then, we study the stability of regression coefficients over time by estimating regression equation (1) for different time periods. If there is heterogeneity across companies in the way that compensation responds to performance, then the assumption of a common slope parameter will yield biased estimates (Conyon and Schwalbach, 2000). Hence, as robustness check we also estimate separate performance and size coefficients for each firm.

Financial and balance sheet data for 1985-2003 are from the Global Vantage database. This database contains financial and balance sheet/income statement information of the largest German corporations. The initial sample of about 600 companies also includes some firms that are not publicly listed. We eliminate from this sample firms with missing data on total assets, market value, income from extraordinary items, and interest expense. For the remaining sample of slightly less than 400 firms we collect information on executive

compensation.

We obtain our data on the ownership structures from "Wer Gehört zu Wem", a publication of Commerzbank AG, which lists all owners and their ownership stakes. This publication is available in 1987, 1991, 1994, 1997, 1999, 2001, and 2003. For missing years we use the most recent ownership data, i.e., we use 1991 data for 1992 and 1994 data for 1993.

Compensation data are from *Kienbaum Vergütungsberatung*, a consulting company.[12] In Germany, even publicly traded companies are not required to disclose the payments made to their executives on an individual basis. Thus, there is no information on pay to individual CEOs and to other executive officers and we have to use compensation defined as average annual total pay (fixed and variable) to the members of the management board. This unfavorable data situation will hopefully change, however, in the near future. According to the German Corporate Governance Code[13], adopted on February 26, 2002 and amended on May 21, 2003, compensation of the members of the management board *shall* be reported in the Notes of the Consolidated Financial Statements subdivided according to fixed, performance-related and long-term incentive components. The figures *shall* be individualized. In case of the existence of stock options the concrete form of a stock options scheme or comparable instruments for components with long-term incentive effect and risk elements shall be published on the company's website in plainly understandable form and be detailed in the annual report. This shall include information on the value of stock options However, as all 'shalls' of the Code are just recommendations. Companies can deviate from them, but are then obliged to disclose this annually. After two years after publication of the Code, only a small fraction of the 30 DAX firms decided to publish compensation data according to the Code.[14]

Obviously, to enforce publication of compensation data on an individual basis a formal law will be required.[15]

In total, we are able to merge compensation data with balance sheet data for 160 firms for the entire period 1987 to 2003. To increase the size of our sample we also make use of additional reports by Kienbaum Consulting starting in 1997. This effort results in an increased sample size of 286 companies in 1998. We have to note that the average size of the companies that we observe only from 1997 onwards is lower than the basic sample of 160 firms. Standard descriptive statistics about compensation data can be found in table 1 providing means and medians as well as standard deviations for average executive compensation. Compensation shows a clear upward trend over time. The median of the compensation measure increases from $286,740 to $620,630 over the 17 year period from 1987 to 2003. The increase is much larger if we concentrate on the sample of 160 companies that we can observe over the whole 1987-2003 period: the increase in the median is 190% and the increase in the mean amounts to 261%.[16]

In contrast, the average return on assets of the sample firms goes down from 4.8% to 2.8% (a similar downward trend is also evident in the medians). The mean size of the sample companies, which measured by total assets, increases over time, even though the median size declines from 1987 to 2003.

The last three columns in Table 1 report the ratio of the average compensation of the management board to the earnings of the companies, which we measure by the sum of income before extraordinary items and interest payments. These numbers indicate that German managers' compensation is a substantial fraction of the companies' earnings. On average the mean manager receives a compensation, which amounts to more than 2.07% of her company's earnings. In our sample, the sample mean of the number of managers in the management

board is 3.7, which implies that almost 8% of the earnings in Germany are paid to managers in form of compensation. This number is greater than the 7.5% figure, which Bebchuk andGrinstein (2004) report for the US companies' top five managers over the 1998-2002, and it highlights the significance of executive compensation from a corporate governance perspective.

The last rows of Table 1 provide descriptive statistics for companies that are grouped into the following four broadly defined industry groups: Manufacturing & Mining (SIC: 100-3999), Utilities (SIC: 4000-4999), Financial and Services (SIC: 6000-9999), and Trade (SIC: 5000-5999). The sample is dominated by manufacturing companies (including mining) (59%). About 22% are in the financial sector, 10% are in the utilities sector, and 7% are trading companies. While absolute compensation figures are higher in manufacturing industries, managers obtain a higher fraction of corporate earnings in the utilities (3.92%) and finance sectors (2.55%). Measured by total assets, companies in the financial industries are dramatically larger than in other industries, however, they are the least profitable in terms of return on assets.

4. Results

4.1 The Impact of Size and Performance on Executive Compensation

We estimate equation (1) thereby constraining the intercepts and the slope coefficients to be equal across all firms. The estimation results using average executive compensation are displayed in table 2. Both size and performance coefficients are significantly positive for the full sample. Using total assets as indicators of size, the estimated size elasticity in the full sample of 160 companies is 0.17.[17] For every 10% increase in firm's size, the average compensation paid to executives of the management board increases by about 1.7%. The

estimated performance elasticity for ROA for the full sample evaluated at the mean is 0.14. These results are comparable with those of Conyon and Schwalbach (1999), Elston and Goldberg (2003), and Grasshoff et.al. (2000). Table 2 also shows that there is considerable variation of elasticities between different industry groups. The ROA elasticity ranges from 0.106 (Financial Sector) to 0.27 (Trade). Size elasticity is highest in utilities.[18]

4.2 Ownership Structure and Executive Compensation

German companies exhibit highly concentrated ownership structures. Table 3 shows that our sample firms are no exception to this regularity. The mean shareholdings of the largest shareholder (*LS*) are equal to 53.14% and the sum of the ownership stakes of the three largest shareholders (*C3*) amounts to 65.54%. We also present the means of the same variables for five different ownership categories which we define following Elston and Goldberg (2003).[19] Firms categorized as "Firm Controlled" are those in which another domestic firm either owns 50% of the outstanding shares or another firm owns at least 25% and no one else owns more than 25%. "Foreign Controlled" firms are those with more than 50% ownership by foreigners. "Bank Controlled" firms are those with more than 50% ownership by banks. "Family Controlled" firms are those with more than 50% ownership by a family or by the members of a family or individuals. We categorize all remaining firms into a single category, "Mixed Control". The firms in this category are those with dispersed ownership, ownership by some miscellaneous categories such as labor unions, cooperatives, foundations and state ownership.[20]

Table 3 presents also the ultimate cash flow rights (*CFR*) associated with the voting rights (*LS*) at the direct level. For the whole sample, the average *CFR* is equal to 40.46%. The ratio of *LS* to *CFR* amounts to 2.04. The mean of *DEV*, which is a dummy variable

indicating the deviation of cash flow rights from voting rights, is equal to 0.22, suggesting that in 22 % of the sample companies *CFR* deviate from voting rights. This ratio is naturally much higher in companies with a bank or firm as the largest shareholder at the direct level. The final column shows the mean of *Pyramid*, which measures the number of pyramidal layers leading from direct ownership to the ultimate owner. An example on the calculation of these variables is provided in Figure 1.

The Impact of Direct ownership

To analyze the impact of ownership concentration on the level of executive compensation, we employ two measures. The first measure is simply the largest direct shareholdings (*LS*). We include LS as a further explanatory variable in equation (1). The first column of Table 4 reports that this variable has a negative coefficient, which is highly significant. The coefficient indicates that as *LS* increases from 34% (the 25th percentile) to 78% (the 75th percentile) executive compensation goes down by almost 18%. Since we control for any size and performance effects (along with year and industry effects), this decrease can be explained solely in terms of stronger monitoring of large shareholders. The inclusion of *LS* as a further explanatory variable increases the explanatory power of equation (1) by almost 10%.

Our second measure of ownership concentration is based on five dummy variables (*Con-5 – Con-1*) where five denotes the highest degree of concentration, with a single owner holding more than 75% of the equity (*Con-5*=1, and zero otherwise). If two or three owners hold more than 75% of the equity and the firm does not qualify for the higher concentration level, then concentration is set at four (*Con-4*=1, and zero otherwise). We set the concentration at three, if a single shareholder holds more than 50% of the shares (*Con-3*=1, and zero otherwise), and two, if two or three shareholders own more than 50% of the shares

(*Conc2*=1, and zero otherwise). Concentration is set at one for all remaining cases (*Conc1*=1, and zero otherwise). The second row in Table 4 reports the estimation results. They indicate that the higher the shareholdings by the largest shareholder the lower the absolute level of compensation. Con-5 has the largest negative impact (-0.249) and it is highly significant. The remaining concentration dummies are also negative, but become smaller in magnitude with the coefficient of Con-4 being -0.16 and Con-3 being -0.063. The coefficient on Con-2 is also negative, however, it is insignificantly different from zero at conventional significance levels.

The column (3) in Table 4 look at the impact of ownership identity on the level of executive compensation. We define five ownership identities. "Firm Controlled": another domestic firm either owns 50% of the outstanding shares or another firm owns at least 25% and no one else owns more than 25%. "Foreign Controlled", "Bank Controlled", and "Family Controlled" firms are those with more than 50% ownership by foreign entities, banks, or families, respectively. All remaining firms (those with dispersed ownership and other ownership identities) are defined as a "Mixed" category and delegated to the intercept.

The coefficients on the ownership dummies show that firms controlled by other domestic firms (*Firm*), foreign entities (*Foreign*), and banks (*Bank*) have lower compensation levels than firms in the mixed category (delegated to the intercept). The magnitudes of the coefficients on the *Foreign* and *Family* dummies are almost equal to each other and indicate that these two types of firms have 8% lower pay levels than firms in the mixed category. On the other hand, the coefficient on Bank dummy is almost three times higher, suggesting that managers of firms under the control of a bank receive almost 29% less than managers of firms in the mixed category. A striking difference is observed for managers of firms under family control. The coefficient on *Family* is close to 0.10 and it is highly significant, suggesting a 10% higher pay level of managers in these firms.

Translated into dollar values these coefficients suggest substantial impacts of ownership identities. For example, firms under the direct control of other firms and foreign entities pay their executives approximately $108,000 more than firms in the *Mixed* category. The negative and significant coefficient of the *Bank* dummy suggests that executives of firms under bank control receive a significant $74,900 less than their counterparts in the mixed category.[21]

The first two equations show that concentrated ownership results in lower levels of executive compensation. These results are in line with Elston and Goldberg (2003) who also show that concentrated ownership is associated with lower levels of compensation and that ownership by banks has a tempering effect. That firms under the control of families have higher compensation levels than other firms differs from Elston and Goldberg (2003) who find that higher concentration by all types of owners reduces compensation with respect to firms in their mixed category.

The Impact of Ultimate Ownership

While the results concerning direct ownership are interesting in their own right they paint an incomplete picture on the impact of ownership structure on the compensation policies. The first objection that one can make to the use of direct ownership measures is that ultimate ownership can be quite different than direct ownership. Indeed, several studies on the ownership and control patterns of firms in Europe and in particular Germany show that deviations from one-share-one vote[22] may have implications on firm behavior. Thus, in this section we first look at the impact of ultimate ownership on the compensation. We also analyze the implications of deviations of cash flow rights from voting rights.

To determine the ultimate owners of the firms in our sample we follow the ownership chains beyond the direct ownership figures at the direct level. We use our ownership data sources to determine the owners of the largest owner in each ownership layer and stop this

15

exercise if the largest owner is a natural person, state or an institution with unknown ownership structure. We are not able to trace the owners of foreign firms if our principal data source does not report them. Hence we end up with the following five ultimate ownership categories: (Domestic) *Firm, Foreign, Bank, Family*, and *Mixed.* The *Mixed* category contains like in the analysis of direct ownership the firms under state ownership, firms with dispersed and miscellaneous categories.[23] We also adjust our concentration measure in the following way. First we use the cash flow rights of the ultimate owner to define the concentration. Secondly, we use four concentration levels: *U-Con-4* is set at 1 if the cash flow rights of the ultimate owner are higher than 75%, and zero otherwise. *U–Con-3* is equal to 1 if cash flow rights are between 50% and 75%. *U-Con-2* is set to 1 if cash flow rights are between 25% and 50%. If cash flow rights are less than 25% or if the firm has a dispersed ownership structure, we set *U-Con-1* equal to 1.

The columns (4)-(6) in table 4 report the impact of ultimate ownership concentration and ultimate ownership identity on the level of executive compensation. The first equation uses a single variable, *CFR*, entered linearly and the ultimate ownership categories. Similar to direct ownership, *CFR* has a negative coefficient and it is highly significant (Column 4).

In column (5), we report the estimation results from using the dummy variables *U-Con-4 – U-Con-1*. U-Con-4 indicates the most concentrated ultimate shareholdings and its coefficient is largest in absolute value (-0.146, t-value 5.66). The coefficients on *U-Con-3* and *U-Con-2* are also negative. However, they are insignificant at conventional levels.

The next column (6) reports the impact of ultimate ownership categories. It suggests that *Bank* and *Foreign* owned firms' managers receive relatively lower compensation than those under mixed category. Families again pay their managers significantly higher levels of compensation.

Deviations from One-Share-One-Vote

Table 2 reported that size and performance have a statistically strong impact on the level of compensation. In this section, we extend equation (1) by interacting the performance and Size variables with *DEV*, which is a dummy variable taking on the value 1 if the cash flow rights of the ultimate owner deviate from the voting rights. Table 5 reports the estimated coefficients when performance is measured by Return on assets (ROA) and size is measured by the logarithm of total assets.

The estimated coefficient of ROA (2.654) is again positive and highly significant showing that superior profitability leads to higher compensation. The interaction of ROA with *DEV* is also highly significant; however it has a negative sign. Its magnitude (-2.261) implies that the link between profitability and compensation is almost absent in firms, where ultimate owners increase their voting rights in excess of their cash flow rights.[24] On the other hand, if we interact *DEV* with the Size variable, we obtain a significantly positive interaction term. This suggests that increases in the size of German companies are associated with much higher levels of executive compensation when voting rights deviate from the cash flow rights. At the same time, the link between pay and performance becomes weaker in firms, where cash flow rights deviate from voting rights.

These findings can be related to a number of other findings in the literature that studies the relationship between the deviation of cash flow rights from voting rights and performance.[25] It is often the case that performance (measured by Tobin's q or by accounting measures such as return on assets) is weaker, when such deviations occur, reflecting the perverse incentives faced by ultimate owners.

4.3 Ownership and Pay-for-Performance Sensitivity

The incentives faced by shareholders to undertake effective monitoring and disciplining of managers increases in their ownership stakes. We therefore expect that pay-for-performance sensitivity as defined by the size of the coefficient b in equation (2) to decrease with ownership concentration.[26] We proceed in two steps. The first three rows in table 6 report the estimated coefficients of equation (2) for the full sample. We report along with ordinary least squares regressions, the estimates obtained using a robust regression technique[27] and we also use median regressions. The estimates in row 1 show that the mean annual change in executive compensation when shareholders earn a zero return is equal to 14,372 $. The estimate of b for the full sample suggests that for each 1000$ change in shareholder value, managers receive an additional 0.005 $. Even though this estimate is statistically significant, its magnitude is economically insignificant. Similar conclusions can be drawn from the results of the robust and median regressions. The explanatory power of all equations is always less than 1% suggesting a very poor fit.

In the next three rows (4-6) we report the estimates of a and b when these coefficients are estimated for the five ultimate ownership categories, *Firm*, *Family*, *Bank*, *Foreign*, and *Mixed*. The OLS results (row 4) show that firms ultimately owned by a *Bank* and by other entities (*Mixed*) reward their managers significant annual pay rises even if shareholders earn a zero return. All four estimates of b for different ownership categories are negligibly small, only one (*Mixed*) being significant. In the robust and median regression results, only firms that are ultimately owned by banks have statistically significant (albeit very small) pay-for-performance coefficients.

5. Summary and Conclusions

Our study documents that executive compensation in German companies amounts to a substantial fraction of companies' earnings. It is therefore an important issue to determine whether these payments are made in such a way to align the interests of shareholders and managers. Unfortunately, our results suggest that this is hardly the case.

We find strong evidence of agency problems caused by the separation of ownership and control. Lack of control by ownership enables management to extract higher executive compensation, thereby confirming a study by Elston and Goldberg (2003) that used an older German dataset of the period 1970 to 1986. We find that the identity of owners has a significant influence on the level of executive compensation. Whereas bank ownership substantially reduces the level of pay, family ownership has a significantly positive impact.

Analyzing the divergences between direct and ultimate ownership, we find that the strong relationship between profitability and compensation is absent in firms where ultimate owners increase their voting rights in excess of their cash flow rights. The estimated pay-for-performance sensitivities are consistent with the view that concentrated owners have better opportunities for supervision and that they reduce even the tiny coefficients obtained for other firms.

While the evidence provided by this paper is not consistent with superior corporate governance practices that align shareholders and managers interests, it is a good explanation why most German managers were reluctant to conceal more information concerning their compensation packages.

References:

Abowd, J. M. and D. S. Kaplan, 1999, Executive Compensation: Six Questions That Need Answering, *Journal of Economic Perspectives* 13: 145-169.

Bebchuk, L.A., J.N. Fried, and D.I. Walker, 2002, Managerial Power and Rent Extraction in the Design of Executive Compensation, *The University of Chicago Law Review*, 69: 751-846.

Bebchuk, L.A. and Y. Grinstein, 2005, The Growth of U.S. Executive Pay, Working Paper.

Benz, M., M. Kucher and A. Stutzer, 2001, Are Stock Options the Managers' Blessing? Stock Option Compensation and Institutional Controls, WP No. 61, Institute for Empirical Research in Economics, University of Zurich.

Boehmer, E., 2000, Who Controls Germany? An Exploratory Analysis, WP University of Georgia.

Boehmer, E., 2001, Germany, in Gugler, K. (Ed.) Corporate Governance and Economic Performance, Oxford University Press, New York, Chapter 9, 96-120.

Claessens, S., S. Djankov and L.H.P Lang, 2000, The Separation of Ownership and Control in East Asian Corporations, *Journal of Financial Economics* 58: 81-112.

Claessens, S., S. Djankov, J.P.H. Fan and L.H.P Lang, 2002, Disentangling the Incentive and Entrenchment Effects of Large Shareholders, *Journal of Finance* 57: 2741-2771.

Clay, D., 2000, The Effects of Institutional Investment on CEO Compensation, WP.

Conyon, M. and J. Schwalbach, 1999, Corporate Governance, Executive Pay and Performance in Europe, In: Carpenter, J. and D. Yermack (eds.) Executive Compensation and Shareholder Value: Theory and Evidence, Kluwer (Dordrecht), Chapter 2, 13-34.

Conyon, M. and J. Schwalbach, 2000, Executive Compensation: Evidence form the UK and Germany, *Long Range Planning* 33: 504-526.

Cosh, A. and A. Hughes, 1997, Executive Remuneration, Executive Dismissal and Institutional Change, *International Journal of Industrial Organization* 15: 469-492.

Dyl, E.A., 1988, Corporate Control and Management Compensation: Evidence on the Agency Problem, *Managerial and Decision Economics* 9: 21–25.

Edwards, J.S., Fischer, K., 1994, *The German Financial System,* Cambridge University Press, Cambridge.

Elston, J.A. and L.G.Goldberg, 2003, Executive Compensation and Agency Costs in Germany*, Journal of Banking and Finance* 27: 1391-1410.

Faccio, M. and L.H.P. Lang, 2002. The Ultimate Ownership of Western European Corporations, *Journal of Financial Economics* 65: 365-395.

Faccio, M., L.H.P. Lang, and L. Young, 2001. Dividends and Expropriation, *American Economic Review* 91: 54-78.

Ferrani, G., N. Moloney and C. Vespro, 2003, Executive Remuneration in the EU: Comparative Law and Practice, ECGI Law WP No. 09/2003.

FitzRoy, F.R. and J. Schwalbach, 1990, Managerial compensation and Firm performance: Some evidence from West Germany. WZB, Discussion Paper FS IV 90-20.

Franks J., and C. Mayer, 2001, Ownership and Control of German Corporations, *Review of Financial Studies* 14: 943-977.

Gerum, E., H. Steinmann and W. Fees, 1988, Der mitbestimmte Aufsichtsrat: Eine empirische Untersuchung, Stuttgart, C.E. Poeschel Verlag.

Goldberg, L.G., Idson, T.L., 1995, Executive Compensation and Agency Effects, *The Financial Review* 30: 313–335.

Grasshoff, U., J. Schwalbach and S. Sperlich, 2000, Executive Pay and Corporate Financial Performance, *Working Paper,* Humboldt University, Berlin.

Gugler, K. (Ed.), 2001, *Corporate Governance and Economic Performance*, Oxford University Press, New York.

Gugler, K. and B.B. Yurtoglu, 2003, Corporate Governance and Dividend Pay-out Policy in Germany, *European Economic Review* 47: 731-758.

Gugler, K., Mueller, D.C., and B.B. Yurtoglu, 2004a, Corporate Governance and the Returns on Investment, *The Journal of Law and Economics*, volume 47 (2): 589-633.

Gugler, K., Mueller, D.C., and B.B. Yurtoglu, 2004b, Corporate Governance and Globalization, *Oxford Review of Economic Policy* 20.

Hall, B. J. and J. B. Liebman, 1998, Are CEOs really paid like Bureaucrats? *Quarterly Journal of Economics* 113: 653-91.

Halvorsen, R. and R. Palmquist, 1980, The Interpretation of Dummy Variables in Semilogarithmic Equations, *American Economic Review* 70: 474-75.

Hamilton, L. C., 1991, How Robust is Robust Regression? *Stata Technical Bulletin*, 2.

Hartzell J. C. and L.T. Starks, 2003, Institutional Investors and Executive Compensation, The Journal of Finance 58; 2351-2374.

Haubrich, J.G., 1994, Risk aversion, Performance Pay, and the Principal-Agent Problem, *Journal of Political Economy* 102: 258-76.

Jensen, M. and K. Murphy, 1990, Performance Pay and Top Management Incentives, *Journal of Political Economy* 98: 225-264.

Kato, T., 1997, Chief Executive Compensation and Corporate Groups in Japan: New Evidence from Micro Data, *International Journal of Industrial Organization* 15: 455-467.

La Porta, R., F. Lopez-de-Silanes, A. Shleifer, and R. Vishny, 2002, Investor Protection and Corporate Valuation, *Journal of Finance* 57: 1147-1170.

La Porta, R., F. Lopez-de-Silanes, and A. Shleifer, 1999, Corporate Ownership around the World, *Journal of Finance* 54: 471-518.

Mueller, D.C. and L. Yun, 1997, Managerial Discretion and Executive Compensation, *International Journal of Industrial Organization* 15: 441-454.

Murphy, K., 1999. Executive Compensation, in Orley Ashenfelter and David Card (eds.), *Handbook of Labor Economics*, Vol. 3, North Holland: 1-90.

Nenova, T., 2003, The Value of Corporate Voting Rights and Control: A Cross-country Analysis, *Journal of Financial Economics*, 325-351.

OECD, 2003, Economic Outlook, No. 74.

Santerre, R.E. and S.P. Neun, 1986, Stock Dispersion and Executive Compensation, *The Review of Economics and Statistics* 88: 685–687.

Santerre, R.E. and S.P. Neun, 1989, Managerial Control and Executive Compensation in the 1930s: A Reexamination, *Quarterly Journal of Business and Economics* 28: 100–118.

Schmid, F.A., 1997, Vorstandsbezüge, Aufsichtsratsvergütung und Aktionärsstruktur. *Zeitschrift für Betriebswirtschaft* 1: 67–83.

Shleifer, A. and R. W. Vishny, 1997, A Survey of Corporate Governance, *Journal of Finance* June, 737-83.

Stigler, G.J. and C. Friedland, 1983, The Literature of Economics: The Case of Berle and Means. *Journal of Law and Economics* 26: 237–268.

Volpin, P. F., 2002, Governance with Poor Investor Protection: Evidence from Top Executive Turnover in Italy, *Journal of Financial Economics* 64: 61-90.

Table 1: Summary Statistics

This table reports summary statistics on the basic variables of interest. Compensation is defined as the average annual total pay (fixed and variable) by the members of the management board. We measure performance using the return on assets (ROA is computed as the ratio income before extraordinary items and interest payments to total assets). The size measure is the total assets. The final three columns report the ratio of compensation to earnings (which is equal to the sum of income before extraordinary items and interest payments). All variables are trimmed by the 1st and 99th percentiles to reduce the impact of influential observations. All variables are in constant (base year is 1995) US dollars to make them comparable to the rest of the literature.

Year	N	Compensation			ROA			Size			Compensation/Earnings		
		Mean	Median	SD	Mean	Median	SD	Mean	Median	SD	Mean	Median	SD
1987	204	327.74	286.74	182.44	4.73%	4.82%	3.20%	10,816.58	1,833.69	25,704.64	1.74%	0.55%	6.10%
1988	212	318.05	269.18	180.93	4.93%	4.80%	3.37%	8,206.92	1,079.26	22,783.96	2.01%	0.72%	3.82%
1989	225	360.94	301.49	229.28	5.79%	5.53%	3.47%	8,629.57	823.34	25,561.92	1.99%	0.88%	3.59%
1990	242	419.44	356.93	231.03	5.43%	5.30%	3.64%	8,897.75	640.23	29,353.92	2.72%	1.07%	7.16%
1991	248	475.2	383.44	724.28	5.70%	5.30%	3.84%	9,427.89	645.05	31,430.24	2.71%	1.19%	14.33%
1992	253	424.91	365.95	263.38	5.17%	5.12%	3.37%	10,058.39	644.86	32,703.01	2.55%	0.90%	10.12%
1993	256	398.52	350.63	223.77	4.93%	4.76%	4.45%	11,191.92	616.88	36,004.06	1.79%	0.90%	10.54%
1994	262	468.97	417.25	282.41	4.37%	4.54%	4.33%	13,728.55	752.04	43,936.98	2.32%	0.89%	8.43%
1995	267	521.67	457.29	329.69	4.14%	4.21%	3.82%	15,627.19	868.76	53,517.52	2.46%	0.80%	5.98%
1996	261	532.29	457.69	347.24	4.61%	4.52%	4.26%	15,933.22	816.88	56,999.93	1.98%	0.81%	7.67%
1997	282	497.26	414.45	329.75	4.14%	4.16%	4.32%	14,660.09	758.47	55,098.86	2.38%	0.90%	11.22%
1998	286	569.82	445.53	438.35	4.79%	4.71%	4.00%	17,766.22	936.26	70,046.39	1.73%	0.91%	5.33%
1999	252	555.98	415.19	535.66	4.17%	4.19%	3.89%	17,200.92	788.84	70,422.15	1.22%	0.79%	12.31%
2000	218	648.77	417.67	1027.5	4.10%	4.15%	3.92%	19,024.52	753.30	77,313.73	1.42%	0.72%	7.03%
2001	209	570.2	409.58	609.52	4.59%	4.43%	3.59%	20,831.88	694.60	78,649.84	1.84%	0.58%	6.74%
2002	189	668.76	451.99	674.46	3.82%	3.73%	4.24%	26,416.64	1,079.49	101,605.23	1.78%	0.54%	17.03%
2003	178	938.91	620.63	1016.08	2.72%	2.87%	4.74%	34,698.50	1,394.92	137,312.22	2.21%	0.80%	6.18%
Manufacturing	2,413	520.82	409.23	523.37	4.70%	4.70%	4.18%	3866.58	575.83	13130.98	1.81%	1.25%	92.24%
Finance	907	507.92	373.46	605.32	4.28%	4.36%	3.77%	55456.41	8490.51	122011.3	2.55%	0.12%	29.23%
Trade	287	462.83	373.28	333.85	5.44%	4.89%	4.47%	2848.21	983.11	5771.21	0.95%	0.85%	4.41%
Utilities	435	433.28	331.01	332.5	3.61%	3.25%	2.78%	8915.37	1844.58	21190.37	3.92%	0.57%	37.69%
Total	4,044	505.16	392.02	517.47	4.56%	4.50%	4.03%	14,886.69	825.39	60,287.18	2.07%	0.84%	9.30%

Table 2   Estimated Size and Performance Elasticities

Table 2 presents the estimated elasticities of compensation with respect to performance (measured by ROA) and size (measured by the natural logarithm of total assets) for the full sample and then in broadly defined industries and for different periods. All equations are estimated using ordinary least squares and include year and industry dummies (defined at the two-digit SIC level). Absolute values of the t-statistics are reported below the coefficients and they are robust to heteroscedasticity. The elasticity of compensation with respect to firm size is the coefficient itself (since the equation is estimated in logarithms). To find the performance elasticity we multiply the coefficient of ROA with its mean value in each sample. This elasticity is reported in the column heading E*.

Sample	Constant	ROA	E*	Size	Adj. R^2	N	NF
Full	-2.44	3.22	0.147	0.172	0.49	3,440	298
	40.82	14.11		42.25			
Manufacturing & Mining	-2.72	3.29	0.155	0.230	0.52	2,054	172
	40.60	14.12		43.73			
Financial	-2.61	2.48	0.106	0.155	0.39	700	66
	19.33	3.99		19.94			
Trade	-3.76	4.96	0.270	0.250	0.56	343	28
	16.82	6.93		17.96			
Utilities	-3.30	5.22	0.188	0. 367	0.54	343	32
	20.22	6.21		17.73			
1987 – 1990	-2.24	3.91	0.206	0.140	0.39	595	205
	30.23	8.28		17.96			
1991 – 1994	-1.92	2.73	0.138	0.138	0.32	854	228
	30.24	7.01		19.29			
1995 – 1998	-2.11	2.76	0.122	0.171	0.36	966	282
	30.53	6.68		22.65			
1999 - 2003	-2.14	3.58	0.142	0.215	0.42	934	248
	25.51	7.14		24.58			

Table 3: Direct and Ultimate Ownership of German Companies

We report summary statistics of variable that reflect the direct and ultimate ownership structures of our sample companies. Ownership identities (Firm, Foreign, Family, bank and Mixed) are described in the main text. LS gives the shareholdings of the largest shareholder. $C3$ is the combined ownership stake of the three largest shareholders. Ultimate ownership patterns are analyzed after tracking the owners of the largest direct owner and its owners etc. (See Figure 1). CFR refer to the cash flow rights of the largest shareholder. LS/CFR gives the ratio of LS to CFR. DEV is a dummy variable which takes on the value one if CFR deviates from LS. $Pyramid$ is the number of pyramidal layers leading to the ultimate owner. Ownership data come from "Wer Gehört zu Wem" for 1987, 1991, 1994, 1997, 1999, 2000, 2001, and 2003.

Identity	Direct Ownership			Ultimate Ownership				
	Fraction of Sample (%)	LS	C3	Fraction of Sample (%)	CFR	DEV	LS/CFR	Pyramid
Firm	18.69	71.91	81.41	1.60	42.46	0.61	3.38	3.20
Foreign	5.43	85.16	86.62	14.24	62.01	0.05	1.43	2.30
Family	12.06	67.45	72.38	32.52	50.23	0.01	1.32	1.67
Bank	13.34	69.49	79.42	14.39	14.94	0.59	4.01	3.63
Mixed	50.47	35.00	52.10	37.25	31.10	0.12	2.27	2.98
Total	100	53.14	65.54	100	40.46	0.22	2.04	2.50

Table 4: The Impact of Ownership Structure on the Level of Executive Compensation

Table 4 reports the impact of ownership concentration and identity on the level of compensation. In all equations the natural logarithm of compensation is the dependent variable. The first three columns report the regression results using direct ownership measures. Column (1) reports the impact of direct ownership concentration, LS, which is defined to be the percentage shareholdings of the largest shareholder. In (2), we employ dummy variables to define the ownership concentration: Con-5=1, if a single owner has more than 75% of the equity, and zero otherwise, Con-4=1, if two or three owners have more than 75% of the equity and the firm does not qualify for the higher concentration level, Con-3=1, if a single shareholder holds more than 50% of the shares, Con-2=1, if two or three shareholders own more than 50% of the shares, and zero otherwise, and Con-1=1, for all remaining cases, which is delegated to the intercept). In column (3) we further introduce ownership identity variables, which are defined as follows: "Firm Controlled": another domestic firm either owns 50% of the outstanding shares or another firm owns at least 25% and no one else owns more than 25%. "Foreign Controlled", "Bank Controlled", and "Family Controlled" firms are those with more than 50% ownership by foreigners, banks, or families, respectively. All remaining firms (those with dispersed ownership and other ownership identities) are delegated to the intercept.

In (4)-(6) we repeat a similar exercise using ultimate ownership. CFR: the cash flow rights of the ultimate shareholder. U-Con-4- U-Conc1 are dummy variables representing the concentration levels calculated using CFR. U-Con-4=1 if CFR >= 75%, and zero otherwise, U-Con-3=1 if CFR >= 50% and CFR<75%, and zero otherwise, U-Con-2=1 if CFR >= 25% & CFR<50%, and zero otherwise, and U-Con-1=1 if CFR < 25% or the ultimate shareholder is an entity with dispersed shareholding structure, and zero otherwise (suppressed). Firm, Foreign, Bank and Family are dummy variables indicating the identity of the ultimate shareholder.

	Direct Ownership				Ultimate Ownership		
	(1)	(2)	(3)		(4)	(5)	(6)
Intercept	-2.819	-2.341	-2.416	Intercept	-3.019	-3.071	-2.563
	42.71	38.17	39.70		46.67	48.50	43.32
ROA	2.676	3.120	2.914	ROA	2.746	2.545	2.879
	13.04	13.89	13.07		13.16	11.76	12.19
Size	0.200	0.167	0.176	Size	0.207	0.207	0.188
	45.60	40.33	41.87		46.88	45.14	39.81
LS	-0.004			CFR	-0.002		
	11.93				5.76		
Con-5		-0.249					
		10.42					
Con-4		-0.160		U-Con-4		-0.146	
		5.83				5.66	
Con-3		-0.063		U-Con-3		-0.033	
		2.38				1.43	
Con-2		-0.032		U-Con-2		-0.013	
		1.01				0.60	
Firm			-0.082	Firm			0.032
			3.41				0.36
Foreign			-0.083	Foreign			-0.060
			2.01				2.04
Bank			-0.289	Bank			-0.075
			10.17				2.43
Family			0.097	Family			0.111
			3.41				4.85
Adj. R^2	0.59	0.41	0.42	Adj. R^2	0.52	0.39	0.41
N	3349	3349	3349	N	3349	3349	3349

Table 5: The Impact of the Deviations of Cash Flow Rights from Voting Rights

DEV is a dummy variable taking on the value 1 if cash flow rights deviate from voting rights, and zero otherwise. The equation includes a full set of year and industry dummies. Absolute values of the t-statistics are reported below the coefficients and they are robust to heteroscedasticity.

|	Coefficient
Intercept	-2.693
	64.78
ROA	2.654
	11.33
ROA * *DEV*	-2.261
	4.94
Size	0.239
	43.44
Size * *DEV*	0.010
	3.18
Observations	3349
Adj.R^2	0.57

Table 6: Ownership Structure and Pay-for-Performance Sensitivity

We report the estimates of equation (2). Rows 1-3 report the estimates of *a* and *b* for the full sample of companies. In rows 4-6 we interact both a and b with dummy variables describing the ultimate ownership identity. See the notes to Table 4 for the definition of ownership related variables. The number of observations for all regressions is 2,784. We report the value of the F-statistic instead of the R-squared for the robust regression models.

	Estimation Method	a	a Firm	a Family	a Bank	a Foreign	a Mixed	b	b Firm	b Family	b Bank	b Family	b Mixed	Adj. R^2/ F
1	OLS	14.372 (3.75)						0.0055 (2.69)						0.051
2	Robust regression	12,771 (4.10)						0.0064 (3.82)						14.6
3	Median Regression	6,404 (2.12)						0.0069 (4.32)						0.005
4	OLS		-6,980 (0.53)	9,024 (1.31)	24,701 (2.73)	7,687 (1.49)	18155 (3.13)		0.0016 (0.18)	0.0021 (0.39)	0.0054 (1.51)	0.0031 (0.94)	0.0069 (2.28)	0.0067
5	Robust regression		-24,749 (1.88)	-9,732 (1.04)	18,020 (2.43)	-7,982 (1.21)	-546 (0.06)		0.0049 (0.66)	0.00006 (0.11)	0.0075 (2.55)	0.0007 (1.39)	0.0070 (2.84)	3.87
6	Median Regression		-27,674 (1.81)	-15,786 (1.45)	18,816 (2.18)	-11,816 (1.31	-7,407 (0.72)		0.0083 (1.47)	0.0119 (2.73)	0.0096 (3.18)	0.0024 (1.69)	0.0049 (1.72)	0.012

Figure 1: Ownership Structure of Jagenberg AG

Figure 1 describes the ownership structure of Jagenberg AG, a sample company, in 1997. There are two direct owners of the Jagenberg AG: Rheinmetall Maschinenbau AG (a domestic non-financial company) and Colonia Versicherung AG (an insurance company) with 52.74% and 12.49% of the shares outstanding, respectively. At the direct level Jagenberg AG is classified as "Firm Controlled" following Elston and Goldberg (2003). The largest direct shareholdings (LS) are equal to 52.74%. To compute our ultimate ownership measure we proceed as follows: Since Rheinmetall Maschinenbau AG is the largest owner with more than 10% of the votes at the direct level, we seek its owners at the second layer. Rheinmetall AG is the largest owner with 100% of the shares. At the third level the largest owner of Rheinmetall AG is Röchling Industrie Verwaltung GmbH with 41.3%, which is finally owned by Family Röchling. In this example, the voting rights (LS) of Family Röchling are equal to 52.74%. The cash flow rights (CFR) are equal to 16.98% (=0.5274*1*0.413*0.78). The ratio of LS to CFR equals 3.1. Since cash flow rights deviate from the voting rights, DEV is equal to 1. Our concentration measure at the direct level is given by Con-3= 1, since LS is greater than 50% but less than 75%. At the ultimate level, U-Con-1 is set equal to 1 since CFR is less than 25%, and other concentration dummies take on the value 0. The number of pyramidal layers leading to the ultimate owner (Pyramid) is equal to 4.
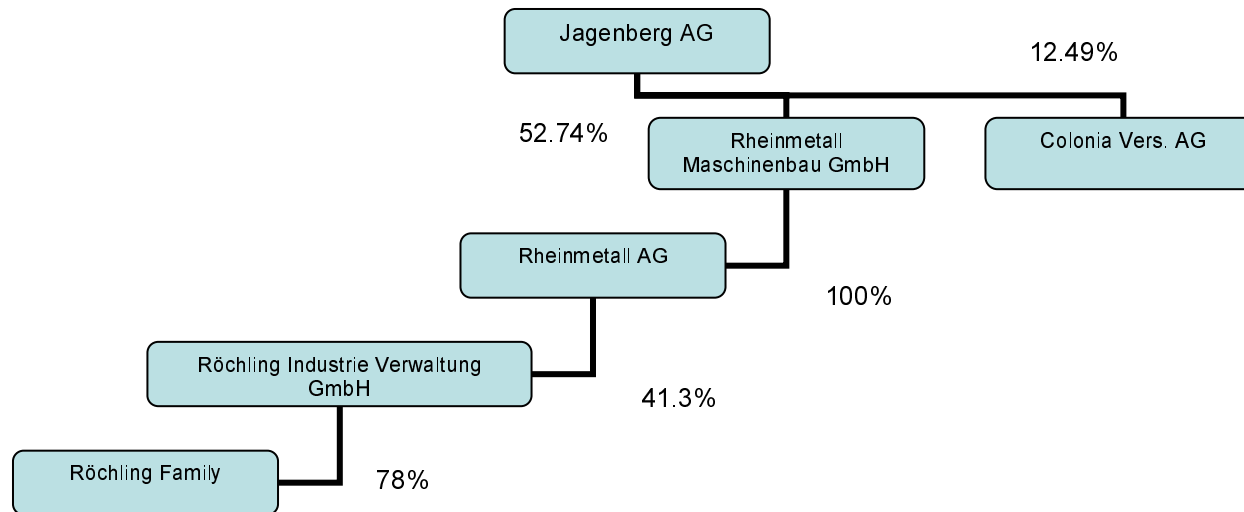
Notes:

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[1] For a recent survey of this literature, see Gugler et al. (2004b).

[2] Hall and Liebmann (1998) report that pay rises by $25.11 for every $1000 change in shareholder wealth.

[3] See, Abowd and Kaplan (1999) and Murphy (1999) for an international comparison.

[4] One way to reconcile these low pay-performance sensitivities with the agency approach is to assume that executives are sufficiently risk-averse (Haubrich, 1994).

[5] Nenova (2003) reports the extent and the effects of such devices for 18 countries.

[6] For a comprehensive account of these issues, see Murphy (1999).

[7] Boehmer (2001) gives three reasons for this conclusion: First, proxy votes and board membership makes banks more powerful than warranted by their cash-flow-rights. Secondly, the stock of debt held by banks is substantially greater than the equity held in the same firm. Thirdly, there is additional fee generating activity involving these firms.

[8] In our later analysis, we follow La Porta et al. (1999) and Faccio et al. (2001) and use a 10% cut-off defining control at all levels of the pyramid. Using a 20% cut-off point does not alter any of our results.

[9] Another salient characteristic of the German system is the existence of cross ownership structures. Within such a structure several companies are linked together through interlocking directorships, which are backed by cross-holdings of one another's shares. The ownership structures of Allianz AG and Münchener Rückversicherung AG reveal an interesting example on cross ownerships.

[10] Kato (1997) finds that CEOs of keiretsu members in Japan earn 21% less after controlling for several firm and CEO characteristics. His results emphasize the monitoring role of banks in Japan.

[11] See Jensen and Murphy (1990) and Hall and Liebman (1998).

[12] We are in indebted to Joachim Schwalbach for providing compensation data for the period 1987 to 1998.

[13] Through the declaration of conformity pursuant to Article 161 of the Stock Corporation Act (AktG) as amended by the Transparency and Disclosure Law, entered into force on July 26, 2002, the Code has a legal basis. The Code is published in its latest version in the official section of the electronic Federal Gazette at www.ebundesanzeiger.de.

[14] Altana, Bayer, Deutsche Bank, Deutsche Börse, Deutsche Telekom, SAP, Schering, and ThyssenKrupp.

[15] For an excellent overview of the regulation of executive compensation in the European Union, see Ferrani, Moloney and Vespro (2003).

[16] These figures imply an annualized growth rate of about 4.6% over the period 1987-2001. According to OECD, average compensation per employee in the business sector in Germany grew at an annualized rate of 2.9% from 1987 to 2001 (OECD, 2003).

[17] We also estimate the same equation by using return on sales, return on equity and share returns as our performance measure and total sales and number of employees as our size measure. The results of these regressions are very close to those reported in table 2. These estimates are available upon request.

[18] Another way to measure the heterogeneity is to estimate equation (1) by allowing each firm to have its slope coefficient for size and performance. When we do this exercise for 120 firms for which we have at least 10 observations, we obtain an average coefficient on ROA, which is equal to 7.073 (median, 0.648). The implied elasticities obtained from individual firm slope coefficients are on average lower than found for panel data. On the other hand a 10 percent increase in size implies a much larger change in compensation based on firm slopes. The bottom line of these estimates (which are available upon request) is that they reveal substantial variation across firms. Hence, differences in executive compensation may be related to other firm specific factors which are omitted from equation (1). In the next section we make a step in this direction by relating the ownership structure of firms to the pay levels.

[19] We have also employed two different definitions for the direct ownership categories. First we used the total shareholdings of firms, families, financial institutions, etc. and have classified firms as, say, family controlled if the total stakes of families were greater than the total shareholdings of any other category. Secondly, we experimented with lower cut-off points than used by Elston and Goldberg (2003). Since our main results were not sensitive to these alternative definitions, we continue with Elston and Goldberg (2003) categories for comparability.

[20] Putting the firms with dispersed ownership which are potentially subject to severe agency problems into the same category with state owned firms may seem strange. State firms are subject to a double or triple agency problem, because they are controlled by politicians who are in principle controlled by voters.

[21] We use the transformation suggested by Halvorsen and Palmquist (1980). $e^{-0.08} = -0.0923$. Since we measure all variables in units of million US dollars this number is multiplied by 10^6.

[22] These deviations are achieved mainly through pyramiding, cross shareholdings and multiple classes of shares. See Gugler (2001), Faccio et al. (2001) and Franks and Mayer (2001).

[23] We have also estimated a separate coefficient for state-owned firms. The coefficient of this dummy was, however, not significant.

[24] Similar results are obtained, when we estimate the same equation by fixed firm effects. We also obtain similar results when we use total sales instead of total assets and return on sales (ROS) instead of ROA.

[25] See Gugler, Mueller and Yurtoglu (2004b) for an overview of this literature.

[26] For a related view see, Benz, Kucher and Stutzer (2001) who find substantially lower stock option grants when control by the board of directors and the shareholders is higher.

[27] We use the robust regression procedure provided by STATA (Version 8). For an overview of this technique, see Hamilton (1991).