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Abstract

Investors and academics increasingly criticize that features of employee stock option (ESO) programs reflect rent-extraction by managers (managerial power view). We use a unique European data set to investigate the relationship between the design of ESO programs and corporate governance structures. We find that ownership structures are related to the ESO design in a way that is consistent with the managerial power hypothesis: when ownership concentration is low and the exposition to the U.S. capital market is little, executives extract rents by designing poor ESO plans. Moreover, firms with weak creditor rights more often have badly designed option plans. Our findings also suggest that ineffective board structures (insider-dominated boards) are related to ESO design in a way that supports the arguments of the self-dealing view.

Keywords: Stock Option Programs, Program Design, Corporate Governance, Empirical Evidence, European Data

JEL Classification Code: G 32, G 34, M 52

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1 Introduction

Recently, active institutional investors and shareholder activists have sharply criticized various features of stock option programs. They argue that the design of many stock option programs is an example of managerial self-dealing and rent-extraction and finally illustrates the inability of existing corporate governance mechanisms in monitoring executives. At the same time, there is increasing criticism in the academic literature saying that both the escalation and the design of stock option compensation reflect managerial rent-seeking rather than optimal contracting. Bebchuk and Fried (2003, 2004) and Bebchuk et al. (2002), for example, argue that managers exercise their influence to maximize wealth transfers with stock options. In their view, executive compensation *reflects* agency problems rather than solving them and weak corporate governance structures lead to an inefficient design of stock options. Bebchuk and Fried as well as Bebckuk et al. argue that several features of stock option plans like no indexing to market movements, exercise prices that equal market prices at grant dates and option repricing activity can be seen as evidence consistent with this kind of rent-seeking.[1] They claim that the greater a manager's power (i.e. the weaker the governance system), the greater his ability to extract rents by influencing executive pay (the so-called managerial power approach).[2] The problem of managerial rent-seeking is known for quite a long time as a quote from Shleifer and Vishny (1997) in their often cited survey on corporate governance shows: "The more serious problem with high powered incentive contracts is that they create enormous opportunities for self-dealing for the managers, especially if these contracts are negotiated with poorly motivated boards of directors rather than with large shareholders."[3]

It is well documented that managers possess significant control rights and that they use their discretion in firms to benefit themselves personally in various ways (by expropriating funds, empire building, consumption of perquisites, no cash-out of free cash flow, and by entrenching themselves in positions that make it difficult to displace them when they

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[1] See also Bertrand and Mullainathan (2001) for an exposition of a contracting view vis-a-vis a skimming view of executive compensation.

[2] Hall and Murphy (2003) contradict this hypothesis by claiming that managerial rent-extraction provides, at best, an explanation for the compensation of *top* executives. They believe that governance structures have improved in the past preventing the extraction of rents by corporate officers.

[3] Shleifer and Vishny (1997), p. 745.

perform badly).[4] Moreover, there is no doubt that managers have at least some influence on the level, structure, and design of their compensation packages. As pointed out by Murphy (1999), the process in which the structure and design of compensation schemes is developed is likely to be exposed to managerial power. Usually, initial recommendations for incentive plans are developed by the internal human resources departments and not by independent advisors.[5] Moreover, compensation recommendations often need the approval of top managers before being passed to the compensation committee. Managers can therefore influence proposals in their own interests.

Following this line of argument, Ryan and Wiggins (2004) state that recent empirical research "... suggests that the process of determining compensation is better described as a negotiation process between the board and the CEO" rather than by an optimal contracting approach.[6] It is therefore evident to ask to what extend the design of stock option programs is determined by variables influencing this bargaining process. We can think of variables such as the structure and composition of the board, the existence of blockholders or differences in legal regimes. Existing research has not provided an answer to this question yet. So far, we do not know whether the design of employee stock option (ESO) programs is indeed affected by blockholders or by the structure and composition of the board of directors.

Recent research in the field of corporate finance suggests that inside board members, large boards, busy chairmen or the absence of large blockholders result in less effective monitoring and in weak corporate governance.[7] Based on this work, we want to investigate in our study whether there exists a significant association between the design of employee stock option programs and the structure of a firm's corporate governance. We try to explain the observed variation in the design of ESO programs with differences in the corporate governance schemes of firms. Simply put, we examine whether firms with weak governance structures have stock option programs that are poorly designed from an economic/agency theoretic point of view.

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[4]See Jensen and Meckling (1976), Shleifer and Vishny (1989, 1997) or Jensen (1986).

[5]Even if outside compensation consultants are involved, it is unlikely that they work independently as their fees depend on the mandates of the advised companies.

[6]Ryan and Wiggins (2004), p. 498.

[7]See Becht et al. (2003), Shleifer and Vishny (1997), Hermalin and Weisbach (2003) or Holderness (2003) for surveys.

To perform this task, data on European stock option programs provides a promising basis. Due to accounting and tax regulations, the variation in the design of ESO programs for U.S. firms is rather limited compared to European firms (see Pasternack and Rosenberg, 2003 or Murphy, 1999). U.S. firms, for example, usually do not use performance-based ESO programs.[8] Our data on European stock option plans therefore provides the unique opportunity to test the importance of governance structures for the design of ESO programs. European stock option plans show large variations with respect to their design features and hence provide a natural environment for an attempt to test the managerial power approach described above.

We analyze the association between the ESO design and governance structures by using detailed data on the option programs of 82 very large corporations belonging to the DAX 30, the Euro Stoxx 50 and the Stoxx 50. Our data set includes information on five core variables of the programs of these firms: on relative and absolute performance requirements, on accounting treatments, participation structures, and on the transparency of the programs. We combine this data set with hand-collected data on the governance structures of the respective firms.

Our main results can be summarized as follows. We find that cross-sectionally, *ownership variables* are related to the ESO design in a way that is consistent with the managerial power view. When ownership concentration is low and the exposition to the U.S. capital market little, executives extract rents by designing poor ESO programs. This finding supports the view that controlling shareholders are important in monitoring managerial compensation and behavior. Our evidence on the role of blockholders complements findings of related studies documenting that large shareholders play an active role in corporate governance. Further support for our self-dealing view is provided by the finding that firms with weaker creditor rights more often have badly designed stock option plans. Our findings further suggest that ineffective *board structures* (insider-dominated boards) are cross-sectionally related to the stock option design in a way that supports the arguments expressed by shareholder activists and academics. More specifically, we find that a higher percentage of outsiders is generally associated with better ESO programs.

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[8]ESO Programs without performance conditions were treated preferably according to FASB accounting rules, see Bebchuk et al. (2002).

The rest of this paper is organized as follows. The next section surveys the literature that links corporate governance, executive compensation, and self-dealing. Section 3 derives benchmarks for the optimal design of stock option programs based on economic insights. It further states the hypothesis we want to investigate empirically. Section 4 presents our data sets and variables, and provides an exposition of the empirical methodology employed. Section 5 documents our empirical results on the design of the studied option programs and its relationship to corporate governance structures. It also presents an interpretation and discussion of our results. The last section summarizes the main findings and concludes.

2 Related Literature on Self-Dealing and Executive Compensation

Several empirical papers have examined the relation between corporate governance structures and various aspects of executive compensation.

Some studies have examined whether there is an association between the level of compensation and governance structures. Core et al. (1999), for example, use a sample with CEO compensation data of 205 publicly traded U.S. firms. They examine the relation between corporate governance (proxied by board and ownership variables) and CEO compensation to test whether CEOs earn greater compensation when corporate governance structures are less effective. Controlling for economic determinants of compensation, they find that the level of CEO pay is increasing in board size, the percentage of outsiders who are gray (outsiders that receive money from the company in excess of the board pay), the percentage of outside directors who are over age 69, and the percentage of outsiders who serve on three or more boards. Moreover, they find that chief executive compensation is lower if the CEO does not serve as the board chair, if he holds a larger fraction of company stock, and if there exists an external blockholder who owns at least 5%. Overall, Core et al. conclude that "... CEOs earn greater compensation when governance structures are less effective."[9] Benz et al. (2001) document that managers raise their stock option compensation in firms with weak governance structures and conclude that their findings

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[9]Core et al. (1999), p. 371.

are consistent with rent-seeking rather than optimal contracting.[10]

Lambert et al. (1993) also find support for what they call the "managerial-power model". Their findings suggest that CEOs get higher salaries when they have appointed a larger fraction of the board members. The existence of a large external blockholder is negatively related to the level of executive compensation. Lambert et al. argue that their "... results provide support for the importance of managerial power in explaining levels of executive compensation".[11] Supporting this view, Boyd (1994) finds that CEO salaries were lower in corporations with higher levels of control.

Other empirical research examines whether corporate governance structures affect the pay-for-performance sensitivity of executive compensation. Hartzell and Starks (2003), for example, find that institutional shareholding concentration and the pay-for-performance sensitivity of executive compensation are strongly positively related. They show that for an average executive, an increase of one standard deviation in the percentage of institutional ownership by the five largest shareholders is associated with an estimated 20% increase in the sensitivity of options to stock price changes. Additionally, they find that institutional ownership concentration is negatively related to the overall level of compensation (after controlling for economic determinants of the level of compensation). In a recent paper, Ryan and Wiggins (2004) find that powerful CEOs use their position to influence the compensation of directors in a way to provide fewer monitoring incentives. Furthermore, they influence their own pay such that it becomes less sensitive to stock price changes.

Newman and Mozes (1999) provide additional evidence suggesting that observed compensation practices are more likely to be consistent with managerial self-dealing than with optimal contracting. They document that CEOs receive preferential treatment when insiders are members of compensation committees. Harvey and Shrieves (2001) find a significant relationship between ownership and board variables on the one hand and the use of incentive compensation on the other hand: incentive compensation is more pronounced in firms with a larger fraction of outsiders on the board and in firms where blockholders are present.[12] Bertrand and Mullainathan (2001, 2002) find that "... better governed firms

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[10]See Hanlon et al. (2003) for conflicting evidence.

[11]Lambert et al. (1993), p. 457.

[12]Similar results are provided by Mehran (1995). He examines the relationship between executive compensation structures

pay their CEO less for luck" (windfall profits) and that CEOs in better governed firms are charged more for the options they are given.[13] Bertrand and Mullainathan conclude that their results can not be explained with a simple contracting approach. They argue that their findings are better explained by a view where CEOs exercise effective power over the pay-setting process (which is consistent with the managerial power approach).

Further evidence for a relationship between compensation practices and governance structures is provided by Yermack (1997). He studies the timing of stock option grants and finds that CEOs receive stock options shortly prior to the release of good news. Since stock options are usually granted with a strike price equal to the stock price on the grant date, CEOs effectively receive in-the-money options by making grants before good news. Compensation and wealth hereby increase by reasons that are unrelated to managerial ability, effort or performance. Moreover, he finds that the difference between the stock price 30 days after grant and the strike price at the grant day is higher in firms with weaker corporate governance. Similar evidence is provided by Aboody and Kasznik (2000).

Other studies have examined the association between ownership/board structures and the repricing of stock options.[14] Some authors provide evidence that option repricing reflects governance problems. Chance et al. (2000), for example, find that insider-dominated boards are more likely to reprice stock options in a way that is favorable to managers (which suggests managerial entrenchment and self-serving behavior). Similarly, Brenner et al. (2000) show that the attendance of executives in the compensation committee increases the likelihood of option repricing. Empirical evidence also suggests that managers tend to time repricing decisions in order to increase option values. Callaghan et al. (2004) document that this kind of timing is "... more likely in firms with weak corporate governance".[15]

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and ownership variables of 153 firms. Mehran finds that companies with more outside directors provide a higher fraction of their executive compensation in an equity-based form.

[13] See Bertrand and Mullainathan (2001), p. 901.

[14] Repricing means the lowering of strike prices of previously granted stock options that are significantly out-of-the-money. The new strike prices are often 30-40% below the old ones (see Chidambaran and Prabhala, 2003). Note that the repricing decision effectively transforms options with little value into options with considerable value.

[15] Callaghan et al. (2004), p. 1652. Contradicting evidence of no association between corporate governance schemes and option repricing is provided by Chidambaran and Prabhala (2003) who study the relation between option repricing and diffuse stock ownership as well as institutional ownership. Similarly, Carter and Lynch (2001) find no evidence that the

The study that is most closely related to our work is a paper by Pasternack and Rosenberg (2003). Using a sample of Finnish firms, they study determinants of the scope of ESO plans, of exercise prices, target groups, and of dividend protection clauses. Their results suggest that firms with bigger monitoring difficulties use more equity incentives.[16] There seems to be no association between their incentive measure and ownership structures. Exercise prices of options and ownership variables also seem to be unrelated. Their results, however, suggest that institutional ownership increases the likelihood that a broad-based option plan is used. Pasternack and Rosenberg also show that the degree of foreign stock owners reduces the likelihood of dividend protection mechanisms in ESO plans.

Our brief literature review shows that empirical evidence suggests that corporate governance schemes and various aspects of executive compensation (such as the level of compensation, its sensitivity to firm performance, the fraction of pay that is equity-based as well as the process of option repricing) are related in a way that is consistent with the managerial power approach.[17] However, the relationship between the design of stock option programs and governance structures is much less explored and also less conclusive. The goal of our paper is to extend the existing literature by explicitly examining the important link between corporate governance schemes and the design of stock option programs.

3   Economic Recommendations and Hypothesis

Before turning to our predictions on the relationship between governance structures and the design of ESO programs, we want to set forth what economics tells us about the "optimal" design of stock option programs. We take these economic insights as a benchmark to evaluate the real ESO programs in our sample. Stock option programs evolved as a solution (or at least a mitigation) of the agency problem that is caused by the separa-

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likelihood of a repricing decision is related to governance problems.

[16]Option incentives are measured as the stock option overhang, i.e. the fraction of equity that is obtained if all granted options are exercised.

[17]For more general expositions on related corporate governance issues, see La Porta et al. (1998, 1999), Shleifer and Vishny (1986, 1997), Gompers et al. (2003), Hermalin and Weisbach (2003), Holderness, 2003, Weisbach (1988) or Becht et al. (2003).

tion of ownership and control.[18] It is uncontroversial among academics that equity-based compensation, if well designed, provides effective incentives to managers.

Agency theory predicts that managers should be awarded for outcomes over which they have control, and which are informative about the actions they have taken (see Holmström, 1979, 1982). Stock prices do provide information about the actions taken by managers. However, they are only noisy measures of executives performance. Efficient compensation contracts should therefore filter out stock price changes that are due to general market trends (windfall profits) and that are hence unrelated to managerial performance. From an optimal contracting point of view, incentive pay should consequently be tied to the performance *relative* to comparable firms or competitors and not to absolute performance as such[19] A relative performance evaluation can essentially be regarded as a way to remove the noise of stock price movements (see Murphy, 1999). To filter out general industry or market trends in practice, the vesting of stock options can be made dependent on the meeting of specific relative performance targets.[20] More specifically, a proper stock option plan could be constructed such that options become exercisable if and only if the stock price of the company outperforms a certain benchmark index consisting of main competitors in the industry.[21]

A stock option plan without any *absolute* performance target is problematic as well. Exercises gains by managers should depend on the firm obtaining at least some minimum stock return that exceeds, for example, the risk-free rate of interest or the firm-specific cost of capital. In the absence of any absolute return targets, managers might realize exercise gains even though a stock investment in the firm did not outperform a risk-free investment. Institutional investors and shareholder activists therefore regularly demand these kinds of stock option programs that contain at least some absolute performance targets. If stock option plans include such benchmarks, incentive effects naturally increase in the stock

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[18]See Jensen and Meckling (1976).

[19]The so-called relative performance evaluation developed in Holmström (1982).

[20]Bebchuk and Fried (2003) call these kind of ESO programs "reduced-windfall" plans. As an alternative mechanism, one can link the exercise prices of stock options to market or sector indexes to get a relative evaluation.

[21]In the U.S., most stock option plans fail to include relative performance targets or indexed exercise prices (see Bebchuk and Fried, 2003). In Europe, this is different, as we will show below.

return that is required.[22] We can therefore conclude that a proper stock option plan should typically include some absolute stock return thresholds that is required to be met before options become exercisable.[23]

From an economic point of view, stock options constitute economic costs to the issuing companies that should be expensed. The cost of a stock option is the amount an outside investor would pay for the option at the date of grant, assuming that he shows exercise and forfeiture patterns that are identical to those of inside employees. In practice, there used to be no legal requirement for the accounting of stock option plans, and many firms were reluctant to expense the costs of ESO programs in their accounts. Accounting Principles Board (APB) Opinion 25, for example, ruled that firms that have set the strike price of their options equal to the stock price at the date of grant, did not have to expense the costs of their option programs at all. Instead, they were asked to disclose an estimate of the value of the ESO program in a footnote. Financial Accounting Standard (FAS) 123, issued in 1995, recommended that firms treat stock option programs as an accounting expense and advised them to use the "fair market value" of options as an estimate for the cost of an ESO plan. However, as FAS 123 provided firms with the choice to continue reporting according to the older APB 25, only a number of firms actually adopted this economically correct FAS approach (see Hall and Murphy, 2003).[24]

Several authors emphasize the economic importance of expensing employee stock options. Guay et al. (2003), for example, argue that "... accounting should reflect the true costs of doing business, and labor acquired through ESO grants is a real economic cost that firms should deduct from earnings as an expense."[25] Moreover, they expose that accounting for ESOs leads to a more efficient functioning of the economic system.[26] Interestingly, Guay et al. also link stock option accounting and corporate governance hypothesizing that better

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[22] At least up to a certain point.

[23] As this argument is questionable from a pure agency theoretic point of view, we also performed our analysis in Section 5 with the exclusion of this design feature. It turned out that the results are robust to the inclusion/exclusion of an absolute performance target in the analysis.

[24] From 2005 onwards, firms are required to expense the costs of stock options under IFRS 2 and US-GAAP.

[25] See Guay et al. (2003), p. 409.

[26] See Fields et al. (2001) for a survey on this issue.

governed firms would be more likely to expense stock option.[27] We can therefore conclude that well governed firms should expense the costs of their ESO programs to reflect their true costs of doing business.

Agency theory provides a rationale why it makes sense to link the compensation of top-managers via stock options to company performance. It is, however, less clear why managers at *lower* levels in a firm should also participate in costly stock option programs. On an individual basis, lower-level employees usually have a significantly smaller impact on firm performance compared to top-managers, and it is well known that stock prices are much less informative about the actions takes by these individuals at lower levels in an organization. Hall and Murphy (2003) therefore argue that "... it seems implausible that stock options provide meaningful incentives to lower-level employees".[28] Using empirical data, Oyer and Schaefer (2005) actually find that stock options for middle-level managers are a very inefficient way of providing incentives.[29] We follow this line of argument and conclude that well-designed ESO plans should only include a limited number of employees (top-managers) whose efforts can have a significant impact on firm value and firm performance.[30]

Finally, in the interest of a clear-cut evaluation of a firm's compensation schemes by investors and shareholders, firms should follow a *transparent* communication strategy with respect to their adopted ESO programs (full transparency in the proxy statements). Disclosures should include information on exercise prices, on the number of options granted and held per director, on vesting conditions or on dilution effects. Information of this type allows both shareholders and investors to critically assess the compensation schemes of firms, their mechanics and incentive effects.

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[27]Empirical evidence by Dechow et al. (1996) suggests that managers from firms that were lobbying against the FASB drafts to expense the costs of options received both a higher total compensation and a higher fraction of compensation in options.

[28]Hall and Murphy (2003), p. 58. Alternative measures of performance such as divisional profits therefore provide much more efficient ways to boost incentives at these lower grades (see Bushman et al., 1995 and Ittner et al., 1997).

[29]They show that for the additional risk imposed on them, very high risk premia need to be paid to get an increase in effort.

[30]See Oyer and Schaefer (2005), Zhang (2002) or Bergman and Jenter (2004) for arguments why firms might use broad-based ESO plans.

Our elaborations so far show that the *precise form* (rather than the pure existence) of ESO contracts matters if options are used to motivate managers in an appropriate way. The above recommendations provide benchmarks that enable us to investigate to what extent the observed features of the stock option plans in our data set are consistent with optimal contracting and agency theory.[31]

Based on the literature that studied the relationship between governance structures and executive compensation and based on economic recommendations on the optimal ESO program design, we can no formulate the hypothesis that we want to test empirically:

$$ESO\,Program\,Design = f(Corporate\,Governance\,Variables,\,Control\,Variables) \quad (1)$$

i.e. we want to test whether the design of stock option programs and governance structures are related. Our null hypothesis is that firms with weaker corporate governance structures have worse designed stock option programs (managerial power approach). Under this null hypothesis, managers extract rents and behave opportunistically by designing option programs that are inconsistent with the recommendations made by agency theory if governance structures are ineffective and weak. We test our hypothesis cross-sectionally using the data described in Subsection 4.1. The variables we use to measure the quality of a firm's governance structures are presented in Subsection 4.2. Finally, the econometric specification employed to test our hypothesized relationship is described in Subsection 4.3.

4 Data Sets and Methodology

4.1 Data Sets

Our empirical analysis is based on the combination of three data sets. The first data set consists of detailed information on ESO program characteristics of DAX 30, Euro Stoxx 50 and Stoxx 50 companies (ESO Data). It includes information on five core variables of the ESO programs: relative and absolute performance targets, accounting treatments, participation structures, and transparency of the respective programs. The program information

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[31]On how we operationalize these suggestions, see Subsection 4.2.

is based on 20-F filings and a mail survey that was conducted by Union Investment, the third largest mutual fund manager in Germany. The second data set includes detailed information on the corporate governance structures of DAX 30, Euro Stoxx 50 and Stoxx 50 firms (Corporate Governance Data). It contains information on various ownership variables (listings and ownership structures), on board variables (structure, size, fraction of outsiders, age and mandates of the chairman) as well as on legal variables (legal system and creditor rights). The information is based on hand-collected data from 20-F filings and annual proxy statements. A third data set comprises information on control variables like Tobin's Q or leverage. The source of data for the latter variables is Datastream. The year of observation is 2003.

Our combined initial data set consists of 89 firms. Seven firms were dropped because they abandoned or stopped their stock option programs in 2003. Three more firms were excluded in the subsequent regression analysis because of missing data. The final sample used for studying our research question therefore consists of 79 corporations.

4.2   Measurement of Variables

ESO Data: For each company j and for each of the five ESO design variables $i = 1, ..., 5$, we construct a subindex that grades the arrangement of the respective variable. The grade of program variable i of company j is denoted as G_{ij}. We grade a company's entire ESO program by grading each of the five program features. To evaluate a firm's stock option program, we use the predictions and suggestions made by economic theory. The better the grade, i.e. the smaller the figure of the subindex, the more consistent is the program feature with recommendations derived and presented in Section 3. Having graded each of the five program features, we construct an overall ESO Grade G_j by aggregating the five subindexes into an overall index (see below).

Relative Performance Target G_{1j} is a variable that measures to what extent the vesting of options in the ESO program of firm j depends on the meeting of specific relative performance targets. It takes the value $G_{1j} = 1$ or 2 if the relative performance target is a company specific benchmark (like the average performance of major competitors), $G_{1j} = 3$ or 4 if it is a standard market index (e.g. the Euro Stoxx 50), and $G_{1j} = 5$ if

no benchmark exists at all.[32] If a non-standard benchmark exists, the grade depends on an individual evaluation. *Absolute Performance Target* G_{2j} is a variable that measures the absolute stock return that is required before options become exercisable. It takes the value $G_{2j} = 1$ if the absolute performance target is larger than 8% p.a., $G_{2j} = 2$ if it is between 6% and 8% p.a., $G_{2j} = 3$ if it is between 4% and 6% p.a., $G_{2j} = 4$ if it is between 2% and 4% p.a., and $G_{2j} = 5$ if it is smaller than 2% p.a.[33] *Accounting* reflects to what extent a firm expenses the economic costs of its stock option program. The variable takes the value $G_{3j} = 1$ if a fair value accounting approach is used by firm j (like IFRS 2 or SFAS 123), $G_{3j} = 2$ if the intrinsic value is expensed, $G_{3j} = 3$ or 4 if the APB 25 methodology is used (disclosure in the footnote only), and $G_{3j} = 5$ if the stock option program is dilutive (no disclosure or expense at all). *Participation Structure* G_{4j} depicts the broadness of a firm's stock option plan. It takes the value $G_{4j} = 1$ if the program is well defined and of small size, $G_{5j} = 2$ if it is of medium size, and $G_{5j} = 3$ if it is very vague and very broad-based. *Transparency* G_{5j} reflects the transparency of the ESO plan of firm j and to what extent an external evaluation of the ESO plan is possible. It takes the value $G_{5j} = 1$ if the program is very transparent to shareholders and investors, $G_{5j} = 2$ if it is only partly transparent, and $G_{5j} = 3$ if it severely lacks transparency (no information on the number of granted options, no data on dilution effects, etc.).[34]

Having graded each of the five program features, we evaluate the *overall* design of the stock option program of firm j by aggregating the grades of the subindexes into a firm-specific overall *ESO Grade Index* (abbreviated G_j). The construction of this index is straightforward and follows the methodology employed in Gompers et al. (2003): for each firm we add the grades of the subindexes into an overall grade of the respective ESO program. The *ESO Grade Index* for a certain company j is therefore given by $G_j = \sum_{i=1}^{5} G_{ij}$, with G_j ranging between 5 and 21.[35] While this index is very simple by

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[32] Whether a 1 or 2 (3 or 4) was assigned depends on the precise construction and the institutional design of the respective program feature. The same applies for the following subindexes if more than one grade per category is stated.

[33] Hereby, the moneyness of the options at the grant date is taken into account.

[34] Even though some option programs severely lacked transparency, we were able to access basically all information needed to assess the option programs in our sample. Being one of the largest fund managers in Germany, Union Investment was able to exercise considerable power over the companies in the data set such that they finally reported the information that was required. We cross-checked these answers with publicly available data.

[35] We are aware that the fact that two subindexes range between 1 and 3 only (while the others range between 1 and 5)

nature, it has the advantage of being transparent and easily reproducible. In the remainder of this paper, we call a stock option program "well designed" if the *ESO Grade Index* G_j is low ($G_j \leq 11$) and "badly designed" if G_j is very high ($G_j > 15$).

Corporate Governance Data: We use measures from three different areas to capture the corporate governance structures of firms: (1) ownership variables, (2) board variables, and (3) legal variables. We employ five measures for the ownership structure of a firm. To reflect the exposure of a corporation to the U.S. capital market with its demanding disclosure and governance requirements as well as with its public scrutiny, we use a binary variable that takes the value 1 if a corporation is listed on the New York Stock Exchange, and 0 otherwise. Based on the findings presented in Section 2 (e.g. the study by Hartzell and Starks, 2003), we believe that ownership structures significantly affect the design of stock option programs. Therefore, we measure whether or not a firm is owned by an entity that holds more than 5% of its capital.[36] We also count the number of blockholders with interests above 5%. Following, for example, Mehran (1995), we calculate the percentage of equity that is held by outside blockholders. We therefore add the percentages of equity owned by individual investors, institutional investors, corporations, families or governments that hold more than 5% of the common stock of a firm. Finally, government ownership is measured by a binary variable that takes the value 1 if the state government or a government-owned institution holds a stake larger than 5% in the firm, and 0 otherwise.

We employ five measures for the structure and composition of a firm's board of directors. To take into account the heterogeneity in European board systems, we use a dummy variable that takes the value 1 if a firm has a unitarian one-tier system with executive and non-executive directors on the same board (like in Spain or in the United Kingdom). Similarly, this dummy takes the value 0 if a corporation is governed by a two-tier system consisting of a supervisory board on the one hand and an executive board on the other hand (like in Germany or in the Netherlands).

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implies an implicit weighting of the subindexes. However, we believe that this weighting is appropriate from an economic point of view. We believe that both the participation structures and the transparencies of the ESO programs are relatively less important for a testing of the rent-extraction hypothesis compared to the remaining three design features. Nevertheless, we tested whether our results are sensitive to this kind of weighting and found that this is not the case (see Subsection 5.4).

[36] If equity holdings and voting rights differ, we use a blockholder's voting rights.

Lipton and Lorsch (1992) and Jensen (1993), among others, argue that larger boards of directors are less effective as monitors than smaller boards. Supporting this argument, recent empirical evidence suggests that small boards of directors perform better monitoring and are associated with better decisions and superior firm performance (see, e.g., Yermack, 1996, Eisenberg et al., 1998 and Hermalin and Weisbach, 2003). We therefore also study the size of a firm's board and its association with the ESO design. We measure board size as the total number of directors on the board of directors (one-tier system)/supervisory board (two-tier system). Recent discussions on corporate governance schemes in Europe stress the importance of independent outside directors for the functioning of an effective governance in firms. In this vein, several studies show that firms with a higher fraction of outsiders make better decisions on issues like executive compensation, CEO turnover or corporate acquisition. (see, e.g. Core et al., 1999, Borokhovich et al., 1996 or Weisbach, 1988).[37] To account for effects due to independent outside directors, we use a variable that is defined as the ratio of independent outside directors to the total number of directors. We define outside directors as members of the board that are neither executives, retired executives, former executives, employees nor union activists.

Core et al. (1999) argue that "... outside directors may become less effective as they grow older or serve on 'too many' boards."[38] Following this conjecture and following other researchers in the field, we ascertain the age of the chairman as well as the number of companies where he is also serving on the board.

A third set of corporate governance variables tries to capture differences in the legal systems as well as in creditor rights (how strong bondholders and banks are protected) among the various European countries. We employ four dummy variables, one to account that a firm is incorporated in a country with English-origin law (e.g. the United Kingdom), one for a French-origin law country (e.g. France, Italy, the Netherlands and Spain), one for a German-origin law country (e.g. Germany and Switzerland), and one for a Scandinavian law country. We use the classification reported in La Porta et al. (1998) as our data source. To measure creditor rights, we also employ the data from La Porta et al. (1998). They use

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[37]Nevertheless, there seems to be no association between the fraction of outside directors and firm performance, see Hermalin and Weisbach (2003) for a survey on this literature.

[38]Core et al. (1999), p. 383.

Table 1: **Definition of Corporate Governance Variables**

This table summarizes and defines the corporate governance variables used in the empirical analysis.

Variable	Description
Ownership variables	
Listing NYSE	Binary variable that takes the value 1 if a corporation is listed on the New York Stock Exchange; and 0 otherwise.
Outside blockholder owns >5%	Binary variable that takes the value 1 if an outside blockholder holds more than 5%; and 0 otherwise.
Number of outside blockholders >5%	Number of outside blockholders that own more than 5%.
Sum percentages outside blockholders >5%	Sum of the stockholdings of blockholders that own more than 5%.
Government ownership	Binary variable that equals 1 if the government or a government-owned institution holds more than 5%; and 0 otherwise.
Board variables	
Board structure	Binary variable that takes the value 1 if a corporation has a one-tier, unitarian board system; and 0 otherwise.
Board size	Total number of members on the board of directors/supervisory board.
Outside directors	Percentage of outside directors on the board/supervisory board (defined as being neither a top executive, retired executive, former executive, employees nor a union activists).
Age chairman	Age of the chairman.
Busy chairman	Number of companies where the chairman also serves on the board.
Legal variables	
English law country	Binary variable that takes the value 1 if a corporation is incorporated in an English law country (see La Porta et al.,1998)
French law country	Binary variable that takes the value 1 if a corporation is incorporated in a French law country (see La Porta et al.,1998)
German law country	Binary variable that takes the value 1 if a corporation is incorporated in a German law country (see La Porta et al.,1998)
Scandinavian law country	Binary variable that takes the value 1 if a corporation is incorporated in a Scandinavian law country (see La Porta et al.,1998)
Creditor rights	Creditor rights based on an index that aggregates different creditor rights (see La Porta et al., 1998)

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an index that is the result of an aggregation of various different creditor rights and that ranges between zero and four. A higher number of the index is associated with stronger creditor rights in a certain country.

Table 1 summarizes the set of governance variables we use in our subsequent analysis.

Control Variables: Control variables used to estimate equation (1) are firm size, leverage, growth opportunities, business risk, and past stock returns. The proxy for firm size is the log of the book value of total assets. Leverage is measured as the ratio of total debt to total assets. Consistent with the literature, our proxy for growth opportunities is Tobin's Q. Tobin's Q is the market value of a firm's securities divided by the replacement costs of its tangible assets. We use the Chung and Pruitt (1994) measure, i.e. the market value of equity, long-term debt, short-term debt, and preferred stock divided by total assets. Following Mehran (1995), we measure business risk by the standard deviation of the percentage change of operating income (sales minus total operating expenses). The latter is measured with annual data ranging from 1998-2003. Stock Return is the annual stock market return over the past five years (in percent). Moreover, we control for industry effects using dummies for the sectors energy, retail, manufacturing, and financial services.

4.3 Methodology

Our null hypothesis is that firms with weak governance structures have poorly designed stock option programs. We use ordered response models to test this hypothesis (ordered logit and probit models).[39] The ordered response is a discrete ordered outcome and given by our *ESO Grade Index* G_j. Ordered response models are used to exploit the ordinal and ordered character of the index data. The fact that an *ESO Grade Index* of 15 is worse than an *ESO Grade Index* of 14 conveys valuable information that we want to make use of.[40] A linear regression assumes that the index categories are equally spaced and treats the difference between, say, 13 and 12 identically to the difference between, say, 12 and 11. However, the index realizations in our set-up provide only an ordinal ranking without

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[39]See, for example, Wooldridge (2002) or Borooah (2002).

[40]As discussed in Borooah (2002), not treating a variable as ordered, when in fact it is ordered, can lead to a loss in efficiency.

cardinal saying (see Borooah, 2002). As linear models are generally easier to interpret than ordered response models and as they give good estimates of the average effects, we also run linear regressions for comparison (see Papke, 1998).[41] We use our corporate governance variables as well as the firm controls as independent variables.

An interpretation of our estimation results has to take into account the possibility that corporate governance structures (like ownership concentration or board outsiders) *as well as* the design of managerial compensation arise simultaneously and endogenously, and depend on firm characteristics only (see Core et al., 1999 or Hartzell and Starks, 2003 for further discussion). In an optimal contracting framework (equilibrium perspective), one should therefore not expect any causal relationship between governance mechanisms and the design of stock option plans. In this view, both elements are set optimally to maximize shareholder value. Moreover, both are determined by factors such as the operating or informational environment of firms. In an out-of-equilibrium environment, however, both aspects can be related in a way that is consistent with managerial self-dealing. Given that increasing empirical evidence suggests that executive compensation is better described by an out-of-equilibrium perspective, we follow the literature and also assume that compensation practices rather follow this second view (see, e.g, Ryan and Wiggins, 2004 or Dittmann and Maug, 2004).

If we observe that firms with weak corporate governance structures have poorly-designed stock option programs, there can therefore be two theoretical explanations: (i) there is no need for high-powered stock option programs *and* strong governance schemes as agency costs are low (equilibrium view) or, alternatively, (ii) managers exploit weak governance structures and missing monitoring devices for self-dealing (out-of-equilibrium view, which is consistent with our null hypothesis).[42] Having these general potential methodological difficulties in mind, we are careful with an interpretation our results and with any attempts to infer causalities out of our findings. We rather concentrate on studying whether empirical regularities between governance structures and the design of option programs exist in our data set and consequently hesitate to draw causal conclusions.

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[41]Using a linear model is rather unproblematic, given that our ordered response can vary between 5 and 21.

[42]Correspondingly, firms with well-designed ESO programs might not experience the need for alternative governance mechanisms (like monitoring by boards or blockholders) to maximize firm value.

Table 2: **Summary Statistics of Firm Characteristics**

This table provides summary statistics on the firms that are included in our data set. The data was obtained from Datastream. Market capitalization is the market value of equity at the end of the year. Sales represents gross sales less discounts for industrial firms, and total operating revenue for financial firms. Total assets is the sum of total assets, long term receivables, investments, plant, equipment and other assets. Bank loans and security holdings are also included. Leverage is measured as the ratio of total debt to total assets. Tobin's Q is the market value of a firm's securities relative to the replacement costs of its tangible assets. We use the Chung and Pruitt (1994) measure, i.e. the market value of equity, long-term debt, short-term debt, and preferred stock divided by total assets. EBITDA is earnings before interest expenses, income taxes and depreciation. Business Risk is measured by the standard deviation of the percentage change of operating income (sales minus total operating expenses) and is measured with annual data from 1998-2003. Stock Return is the annual percentage stock market return for the prior five years. The year of observation is 2003.

Firm characteristics

Variable	Mean	Median	Min.	Max.	Std.dev.
Market capitalization (million Euro)	33,810	28,301	3,536	136,478	27,537
Sales (million Euro)	34,829	28,991	1,514	141,343	27,900
Total Assets (million Euro)	180,511	53,126	2,453	896,487	250,108
Leverage	0.2588	0.2618	0.0051	0.5333	0.1419
Tobin's Q	1.1207	0.7802	0.0793	6.7721	1.0984
EBITDA (million Euro)	5,823	4,982	-444	22,645	4,690
Business Risk	181.86	52.98	4.39	2.709	408
Stock Return	3.7790	2.6237	-55.4347	87.7419	17.5508

5 Empirical Results

5.1 Sample Characteristics

Summary statistics for a set of characteristics of the firms in our sample are presented in Table 2. The year of observation is 2003. The data was obtained from Datastream. Market capitalization is the market value of equity at the end of the year. The mean (median) market capitalization is approximately 33.8 billion Euro (28.3 billion Euro). The average value of the firms' sales is about 34.8 billion Euro (median 29.0 billion Euro), with a

maximum of 141.3 billion Euro. Sales represents gross sales less discounts for industrial firms, and total operating revenue for financial firms. The mean (median) value of the sample firms' total assets is 180.5 billion Euro (53.1 billion Euro). Leverage is measured as the ratio of total debt to total assets. The mean (median) leverage is 0.2588 (0.2618), and the mean (median) value of Tobin's Q is 1.1207 (0.7802). Firms generated positive cash flows on average, with a mean (median) value of EBITDA equal to approximately 5.8 billion Euro (5.0 billion Euro), and a minimum (maximum) of -444 million Euro (22,6 billion Euro). EBITDA is defined as earnings before interest expenses, income taxes and depreciation. Business Risk is measured as defined above and based on annual data from 1998-2003. The mean (median) value of our business risk measure is 181.86 (52.98). Finally, the mean (median) stock price performance over the five year horizon was about 3.78% (2.62%) p.a. All currencies were transferred into Euro on the basis of year-end exchange rates.

5.2 Governance Structures and Stock Option Design: Descriptive Results

Descriptive statistics of our corporate governance variables are presented in Table 3. About 61% of the companies in the sample have either common stocks or American Depository Receipts (ADR) that are traded on the New York Stock Exchange. Large investors play an important role in our data set. Approximately 65% of all firms have a blockholder that owns more than 5% of a firm's voting rights. This figure is mainly driven by German, French, and Italian firms. The mean (median) number of blockholders that own more than 5% is 1.1707 (1.0000), with a maximum of 7 individual blockholders in one corporation. Ownership structures are not widely dispersed compared to the U.S., with 18.80% of the equity being held by investors that own more than 5% of the respective firms' capital (median 12.20%). Not surprisingly, national governments still play a significant role in our sample corporations, with 14.63% of the firms having the state or a government-dependent institution as a significant shareholder owning more than 5%.

One-tier and two-tier board systems are about equally distributed with approximately 48% of the firms having a one-tier system. Note that French corporations have the choice between an Anglo-American style one-tier system and a German style two-tier system

Table 3: **Descriptive Statistics of Corporate Governance Variables**

This table provides summary statistics of the corporate governance variables used in our empirical analysis. The corporate governance data was obtained from 20-F filings and from proxy statements. For a description of the variables, see Table 2. The year of observation is 2003 and the sample consists of 82 firms.

Panel A: Ownership variables

Variable	Mean	Median	Min.	Max.	Std.dev.
Listing NYSE (0/1)	0.6098				
Outside blockholder owns >5% (0/1)	0.6463				
Number of outside blockholders >5%	1.1707	1.0000	0.0000	7.0000	1.2650
Sum percentages outside blockholders >5%	18.80	12.20	0.00	83.01	21.77
Government ownership (0/1)	0.1463				

Panel B: Board variables

Variable	Mean	Median	Min.	Max.	Std.dev.
Board structure (0/1)	0.4756				
Board size	13.63	13.00	0.00	22.00	4.79
Outside directors	0.6867	0.7000	0.2500	1.0000	0.2113
Age chairman	62.85	63.00	48.00	79.00	5.52
Busy chairman	3.59	3.00	0.00	9.00	2.43

Panel C: Legal variables

Variable	Mean	Median	Min.	Max.	Std.dev.
French law country (0/1)	0.4146				
English law country (0/1)	0.1707				
German law country (0/1)	0.4042				
Scandinavian law country (0/1)	0.0122				
Creditor rights	2.1951	2.5000	0.00	4.00	1.3648

(which has been adopted by some firms).[43] The average board consists of 13.63 directors, a figure that is close to the one reported in Core et al. (1999). Board size, however, varies widely with the largest board consisting of 22 directors. On average, boards have about 69% outside directors, ranging from only 25% to 100%. Our figures on board independence reflect recent attempts in Europe to strengthen governance structures by following suggestions made by various national governance committees to increase the number of independent directors.[44] The oldest chairman in our data set is 79 years old, whereas the mean and median age is about 63 years. On average, chairmen serve on 3.59 additional boards of directors/supervisory boards. Again, the numbers vary widely across the firms (between 0 and 9 additional supervisory mandates).

17.07% of the firms are incorporated in a country with English-common-law origin, 41.46% with French-civil-law origin, 40.24% with German-civil-law origin, and 1.22% with Scandinavian-law origin. The mean (median) value for our measure of creditor rights is about 2.20 (2.50).[45]

Table 4 gives summary statistics for the *ESO Grade Index* G_j and the 5 subindexes. Recall that G_j is the sum of the 5 subindexes and that the index has a possible range from 5 to 21. Panel A shows that the mean (median) value of the index is 14.38 (14.00). The company with the option program that is most consistent with economic recommendations has an index value of 8, which is only slightly above the best possible value. Panel A also shows that the highest ESO Grade in our data set is 21. Panel B documents that the sample companies show a very large variation in the design of their stock option programs. If we define a stock option program as being "well designed" if G_j is low ($G_j \leq 11$) and as "badly designed" if it is very high ($G_j > 15$), than only about 27% of the programs can be considered as being "well designed". But on the other hand, around 44% of the programs have to be regarded as being non-satisfactory ("badly designed") as their program features are not consistent with economic recommendations. Interestingly, Panel C of Table 4 gives summary statistics for the five subindexes. Recall that the subindexes

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[43] French firms have the choice between the traditional unitarian system based on the powerful Président Directeur Générale (PDG) and, alternatively, a two-tier system with both a supervisory board and an executive board.

[44] Examples are the Viénot Committee in France, the Draghi Commission in Italy or the Regierungskommission Deutscher Corporate Governance Kodex in Germany.

[45] See La Porta et al. (1998) for comparison and for a detailed definition of the variable.

Table 4: **ESO Program Index and Subindexes: Summary Statistics**

This table presents summary statistics of the *ESO Grade Index* that is used in our empirical analysis. The sample consists of 82 firms. The program data is based on 20-F filings and a mail survey conducted by Union Investment. The year of observation is 2003. For definitions, see Subsection 4.1.

Panel A:

ESO Grade Index G_j: Summary Statitics

Mean	14.38	Median	14.00
Min	8.00	Max	21.00
Std.dev.	3.50	Obs.	82

Panel B:

ESO Grade Index G_j: Distribution

Realization	Freq.	Percent	Cum.
$5 < G_j \leq 7$	0	0.0000	0.0000
$7 < G_j \leq 9$	5	0.0610	0.0610
$9 < G_j \leq 11$	17	0.2074	0.2683
$11 < G_j \leq 13$	14	0.1707	0.4390
$13 < G_j \leq 15$	10	0.1220	0.5610
$15 < G_j \leq 17$	17	0.2073	0.7683
$17 < G_j \leq 19$	14	0.1707	0.9390
$19 < G_j \leq 21$	5	0.0610	1.0000

Panel C:

Subindexes: Summary Statistics

Subindex	Mean	Median	Std.dev	Min.	Max.
Relative Performance Target	3.48	4.00	1.48	1.00	5.00
Absolute Performance Target	4.46	5.00	0.84	1.00	5.00
Accounting	3.09	3.00	1.63	1.00	5.00
Participation Structure	1.66	2.00	0.71	1.00	3.00
Transparency	1.70	2.00	0.75	1.00	3.00

Panel D:

Subindexes: Frequency of realizations

Subindex	1	2	3	4	5
Relative Performance Target	11	14	14	11	32
Percent	13.41	17.07	17.07	13.41	39.02
Absolute Performance Target	2	0	12	12	56
Percent	2.44	0.00	14.63	14.63	68.29
Accounting	22	13	9	12	26
Percent	26.83	15.85	10.98	14.63	31.71
Participation Structure	39	32	11	-	-
Percent	47.56	39.02	13.41	-	-
Transparency	39	29	14	-	-
Percent	47.56	35.37	17.07	-	-

Relative Performance Target, *Absolute Performance Target* and *Accounting* range from 1 to 5, while *Participation Structure* and *Transparency* range from 1 to 3 only. Panel C documents that the absolute performance targets of firms are much less ambitious than their relative ones (mean values of 4.46 and 3.48, respectively). The median firm discloses the costs of its ESO programs in the footnotes only. More information on the exact distribution of the grades for the subindexes are provided in Panel D. It shows, for example, that only 22 companies (26.83%) use a fair value accounting approach to expense the costs of their stock options, while 26 firms (31.71%) do not disclose or expense ESO costs at all. Astonishingly, 68.29% of all firms have absolute performance targets that require annual stock price increases of below 2%.[46]

Table 5 shows examples of the ESO design features of six selected companies (including the values for the five subindexes as well as for each overall *ESO Grade Index* G_j; summaries only).

Spearman correlation coefficients between the five subindexes as well as the significance level of each correlation coefficient (in parentheses) and the number of observations used in calculating the coefficient are presented in Table 6. Among other things, it shows that firms with low relative performance targets generally have broad-based ESO programs. Transparency is significantly associated with better relative performance targets, better accounting practices and more focused participation structures. The table also shows that firms with high relative benchmarks typically do not seem to simultaneously employ high absolute performance targets.

The question that remains to be answered after this section is whether the drastic variation in ESO designs is significantly associated with differences in governance structures. In the next subsection, we investigate this issue in more depth. We study whether firms with poorly designed stock option programs show identifying characteristics with respect to their governance structures.

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[46]See Winter (2002a,b) for a descriptive study on performance targets of ESO programs in Germany. Buck et al. (2004) document case studies on the the design of stock option programs in Germany and the UK.

Table 5: **Examples of ESO Program Features**

This table presents examples for the design features of ESO programs of six selected companies (summaries only). It includes information on their relative performance targets, their absolute performance target, their accounting practices, their participation structures as well as on the transparency of their programs. The table also includes the grades of the subindexes and the overall *ESO Grade Index* G_j of firm j.

Company	Relative Performance Target	G_{1j}	Absolute Performance Target	G_{2j}	Accounting	G_{3j}	Participation Structure	G_{4j}	Transparency	G_{5j}	G_j
Air Liquide	no target	5	no target	5	dilutive	5	senior executives and employees	2	partly transparent	2	19
Bayer	Euro Stoxx 50	3	4.6% p.a.	3	market-to-market	2	clearly defined but large	2	very transparent	1	11
Barclays	outperf. againts peer group of 11 banks	1	company specific	5	SFAS 123, expensed	1	executive directors	1	very transparent	1	9
DaimlerChrysler	no target	5	1.84% p.a.	5	SFAS 123 expensed	1	clearly defined but large	2	very transparent	1	14
Suez	Euro Stoxx Utility Index (1% p.a.)	1	3.7% p.a.	4	French GAAP, dilutive	5	chief executives, executives (2,069), medium, defined	2	partly transparent	2	14
Total	no target	5	no target	5	French GAAP, dilutive	5	top executives, officers and other employees (in 2003: 3,950)	2	partly transparent	2	19

Table 6: Correlation between ESO Program Subindexes

This table presents Spearman correlations between the subindexes *Relative Performance Target*, *Absolute Performance Target*, *Accounting*, *Participation Structure*, and *Transparency*. It further includes the significance level of each correlation coefficient (in parentheses) as well as the number of observations used in calculating the correlation coefficient. * indicates significance at 10%; ** indicates significance at 5%; *** indicates significance at 1%.

	Relative Performance Target	Absolute Performance Target	Accounting	Participation Structure	Transparency
Relative Performance Target	1.0000				
	82				
Absolute Performance Target	0.0680	1.0000			
	(0.5438)				
	82	82			
Accounting	0.1652	0.1742	1.0000		
	(0.1379)	(0.1176)			
	82	82	82		
Participation Structure	0.4753	0.1223	0.1655	1.0000	
	(0.0000)***	(0.2736)	(0.1374)		
	82	82	82	82	
Transparency	0.3681	0.1666	0.3809	0.4439	1.0000
	(0.0017)**	(0.1346)	(0.0004)***	(0.0000)***	
	82	82	82	82	82

5.3 Governance Structures and Stock Option Design: Regression Results

The association between corporate governance structures and the stock option design is examined using cross-sectional ordered response models (see Section 4). The regression includes the *ESO Grade Index* G_j as the ordered response, and corporate governance as well as control variables as regressor. Regression results for an ordered logit, an ordered probit and, for comparison, for a linear regression model are presented in Table 7. For expositional clarity, law and industry dummies are not reported in this table.[47] They all turned out to be insignificant. t-statistics are reported in parentheses.[48]

The regression results show that firms that are listed on the New York Stock Exchange employ stock option programs that are better designed on average. Thus, European companies that are exposed to the U.S. capital market seem to provide less rent-extraction and self-dealing opportunities to their managers (when option programs are considered). This result is certainly due, at least in part, to the public scrutiny and the disclosure requirements that result from listings on the New York Stock Exchange (e.g. by the SEC).

Furthermore, we find a negative and significant relation between our measure of the percentage of equity held by blockholders and G_j. That is, firms with a higher fraction of blockholders have better designed stock option programs on average. This finding supports the view that controlling shareholders are important in monitoring managerial compensation and behavior. They seem to put pressure on the management in a way that prevents self-dealing with poorly designed ESO programs. Our evidence on the role of blockholders in exercising corporate governance complements evidence of other studies in the field. Shleifer and Vishny (1997), Franks and Mayer (2001), Shivdasani (1993) and others also document that large shareholders play an active role in corporate governance.[49] With respect to the more specific issue of executive compensation, our finding is in line with results showing that ownership structures and executive compensation are related in a

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[47]We excluded the number of blockholders that own more than 5% as well as the dummy indicating whether a blockholder is present or not from our regression analysis. We catched the effects of these variables by using the percentage of blockholders that own more than 5%.

[48]Note that the magnitudes of coefficients in ordered response models do not have a simple interpretation. See, for example, Wooldridge (2002).

[49]For further evidence, see Becht et al. (2003) and Hermalin and Weisbach (2003).

way that better governance structures are associated with higher pay-performance sensitivities and lower managerial compensation (see, e.g., Hartzell and Starks, 2003, Lambert et al. (1993) or Core et al., 1999).

The coefficients for government ownership and board structure turned out to be insignificant, suggesting that state ownership and the general board structure (one-tier vs. two-tier) are not systematically related with the corporate stock option design.

Our board variables provide a less clear cut picture. If board sizes increase, we typically expect that boards have greater coordination problems and hence perform monitoring less effectively. In the case of ESO programs, this would suggest that executives exploit these circumstances by influencing their stock option pay in the way that incentive effects and the overall ESO design become less ambitious. Contrary to this conjecture, we find that firms with larger boards *more often* have well designed stock option programs. The coefficient of board size is negative and significant in both ordered response specifications as well as in the linear regression model.

Consistent with the rent-extraction view, we find a significant association between the fraction of outsiders on the board and the design of the ESO programs. More specifically, our evidence suggests that a higher percentage of outsiders is generally associated with better ESO programs. This result is similar to the conclusions in Core et al. (1999), Chance et al. (2000), Bertrand and Mullainathan (2001), and related papers that document the ability of executives to influence compensation packages through their ability to influence non-independent inside directors. Consequently, we have strong evidence suggesting that board composition of firms is not only of symbolic but rather of economic importance. Surprisingly, we find that the design of option programs is better in firms where the chairman serves on a larger number of other boards.

Further support for the view that governance structures and managerial self-dealing are related is provided by the coefficient of our creditor rights variable. We find that firms with greater creditor rights employ ESO programs that are more consistent with economic recommendations. Strong creditor rights therefore seem to limit the opportunistic behavior of managers regarding the design of their option programs.[50]

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[50]Note that rent-extraction can have a significant impact on creditors.

Table 7: **Relationship between ESO Program Index and Corporate Governance Variables: Ordered Response and Linear Regression Models**

This table shows estimates of ordered response models (ordered logit and probit). The ordered response is the *ESO Grade Index* G_j. Definitions of the explanatory governance variables are presented in Table 1. As controls, we use firm size, leverage, Tobin's Q, business risk, the past stock return, and industry dummies. For expositional clarity, the law and industry dummies are not reported in this table. They all turned out to be insignificant. We excluded the number of blockholders that own more than 5% as well as the dummy indicating whether a blockholder is present or not from our regression analysis. t-statistics are reported in parentheses. To simplify interpretation, we also present estimation results from a linear regression. * indicates significance at 10%; ** indicates significance at 5%; *** indicates significance at 1%.

Dependent variable: ESO Grade Index G_j	**Ordered Logit**		**Ordered Probit**		**Linear Regression**	
Independent Variables	Coef.	t-statistics	Coef.	t-statistics	Coef.	t-statistics
Listing NYSE	-1.067	(-2.02)**	-0.567	(-1.88)*	-1.282	(-1.62)
Log(Sum perc.outside blockh. > 5%)	-4.212	(-2.43)**	-2.306	(-2.31)**	-4.440	(-1.72)*
Government ownership	1.141	(1.54)	0.582	(1.32)	1.167	(1.01)
Board structure	1.023	(1.38)	0.631	(1.36)	1.542	(1.26)
Board size	-0.237	(-3.13)***	-0.124	(-2.77)***	-0.258	(-2.24)**
Outside directors	-3.476	(-1.84)*	-2.092	(-1.93)*	-3.971	(-1.41)
Age chairman	-0.054	(-1.04)	-0.017	(-0.61)	-0.071	(-0.96)
Busy chairman	-0.264	(-2.17)**	-0.116	(-1.74)*	-0.261	(-1.50)
Creditor rights	-0.944	(-2.62)***	-0.478	(-2.34)**	-0.934	(-1.78)*
Size	0.178	(0.25)	0.164	(0.41)	0.465	(0.44)
Leverage	0.236	(0.14)	-0.144	(-0.14)	-0.116	(-0.04)
Tobin's Q	0.765	(2.66)***	0.461	(2.81)***	1.109	(2.61)**
Business Risk	0.001	(1.71)*	0.000	(2.00)**	0.002	(1.93)*
Stock Return	-0.038	(-1.91)*	-0.021	(-2.20)**	-0.048	(-1.92)*
Pseudo R^2		0.1625		0.1543		
Adjusted R^2					0.3920	
LR $\chi^2(23)$		64.58		61.33		
Prob > χ^2		0.0000		0.0000		
Prob > F					0.0001	

The estimation results moreover show that the design of a firm's stock option program is cross-sectionally related to a company's growth opportunities (as proxied by Tobin's Q), its business risk (as proxied by the standard deviation of the percentage change of operating income), and its past stock market return. Firms with higher growth opportunities and with a higher business risk have programs that are more poorly designed on average. This finding might reflect that high volatility companies with many growth opportunities need to offer broad-based ESO programs that are likely to be in-the-money to attract high quality managerial talent. Core et al. (1999) provide a similar argument to interpret their finding that firms with higher investment opportunities pay higher CEO compensation. The coefficient of Stock return is negative and significant showing that firms with a high annual stock market return over the past five years generally have better designed ESO plans. The coefficients on firm size (proxied by the log of total assets) and leverage turned out to be statistically insignificant.

In terms of overall performance of our econometric models, our regression results indicate that corporate governance variables together with our controls have significant power in explaining the observed variation in the design of ESO plans (pseudo R^2 of 16.25% and 15.43% respectively, and Prob $> \chi^2 = 0.0000$ for both ordered response models).[51]

Overall, our results provide strong evidence on the view that poor governance schemes are generally associated with badly designed stock option programs. We find that *ownership structures* are related to the ESO design in a way that is consistent with the managerial power/rent-extraction view. The significant signs of the variables that capture the influence of blockholders and the NYSE listing confirm the view that when governance systems are weak, executives can extract rents by designing poor ESO programs. Further support for this perspective is provided by the finding that weak creditor rights are correlated with poorly designed stock option plans. Our results further suggest that the *board composition* is also related to the ESO design in a way that supports the arguments of the managerial power view. However, our measure of board size is negatively related to the *ESO Grade Index* which is contrary to the hypthesis that larger boards provide more opportunities for managers to extract rents. It is also contrary to many recent findings suggesting that larger boards monitor less effectively.

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[51]Note that a pseudo R^2 of around 16% is relatively high for these kind of estimation models.

In summary, we can conclude that we have found evidence supporting our null hypothesis which says that firms with weaker governance structures have worse designed stock option programs.

5.4 Robustness Checks

We performed several checks to test the robustness of our results. In particular, we studied whether our findings are robust to the exclusion of the absolute performance target, and whether the implicit under-weighting of the participation structure and transparency grade have a significant impact on our results.

We argued that an evaluation of the presence and design of absolute performance targets might not be justified from an agency theoretic point of view. However, we included this design feature in our analysis because of the arguments presented in Section 3. In this subsection, we provide regression results that were obtained when we excluded the absolute performance target from our calculation of the overall *ESO Grade Index* G_j.[52] Thus, the resulting new *ESO Grade Index* G_j^{mod} now ranges between 4 and 16. Regression results using this modified index are presented in Table 8. Again, law and industry dummies are not reported in this table. Apart from the retail dummy (significant at the 10%-level; positive sign), they all turned out to be statistically insignificant again.

Overall, the figures in Table 8 show that our results are robust to the exclusion of a subindex that evaluates the absolute performance target of a certain ESO plan: the regression results again document that firms listed on the New York Stock Exchange have stock option programs that are better designed on average. Moreover, we still find a negative and significant relation between our measure of the percentage of equity held by blockholders and the *ESO Grade Index* G_j^{mod}. We find further evidence suggesting that ineffective board compositions (few outsiders only) are associated with badly designed ESO plans. Our conclusions made in the previous subsections therefore hold independent of the inclusion of a grade for an absolute performance target.

To account for the possibility that the implicit but deliberate under-weighting of the

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[52]Thus, the *ESO Grade Index* was calculated on the basis of the following four subindexes: *Relative Performance Target*, *Accounting*, *Participation Structure*, and *Transparency*.

Table 8: **Relationship between the Modified ESO Program Index and Corporate Governance Variables: Ordered Response and Linear Regression Models**

This table shows estimates of ordered response models (ordered logit and probit). The ordered response is the *modified ESO Grade Index G_j^{mod}* (exclusion of absolute performance target). Explanatory governance variables are listed in Table 1. As controls, we use firm size, leverage, Tobin's Q, business risk, the past stock return, and industry dummies. For expositional clarity, the law and industry dummies are not reported in this table. To simplify interpretation, we also present estimation results from a linear regression. t-statistics are reported in parentheses. * indicates significance at 10%; ** indicates significance at 5%; *** indicates significance at 1%.

Dependent variable: ESO Grade Index G_j	Ordered Logit		Ordered Probit		Linear Regression	
Independent Variables	Coef.	*t*-statistics	Coef.	*t*-statistics	Coef.	*t*-statistics
Listing NYSE	-1.133	(-2.11)**	-0.570	(-1.89)*	-1.205	(1.66)
Log(Sum perc.outside blockh. $> 5\%$)	-4.058	(-2.31)**	-2.231	(-2.22)**	-4.223	(-1.78)*
Government ownership	1.180	(1.56)	0.689	(1.54)	1.259	(1.18)
Board structure	1.503	(2.01)*	0.884	(1.89)*	1.914	(1.70)*
Board size	-0.211	(-2.75)***	-0.112	(-2.51)**	-0.229	(-2.16)**
Outside directors	-4.077	(-2.10)**	-2.157	(-1.97)**	−4.286	(-1.65)
Age chairman	-0.044	(-0.87)	-0.028	(-0.99)	-0.077	(-1-13)
Busy chairman	-0.280	(-2.31)**	-0.144	(-2.15)**	-0.285	(-1.78)*
Creditor rights	-0.863	(-2.39)**	-0.449	(-2.20)**	-0.819	(-1.70)*
Size	0.614	(0.86)	0.421	(1.03)	0.881	(0.90)
Leverage	0.673	(0.39)	0.218	(0.21)	0.319	(0.13)
Tobin's Q	0.732	(2.45)**	0.425	(2.59)***	0.965	(2.47)**
Business Risk	0.001	(1.63)	0.001	(1.64)	0.001	(1.75)*
Stock Return	-0.040	(-2.02)**	-0.022	(-2.29)**	-0.047	(-2.04)**
Pseudo R^2		0.1666		0.1665		
Adjusted R^2					0.4000	
LR $\chi^2(23)$		64.24		64.17		
Prob $> \chi^2$		0.0000		0.0000		
Prob $> F$					0.0001	

subindexes for *Participation Structure* and *Transparency* has an impact on our results, we also performed regressions where all five indexes where measured on a one to five scale.[53] Again, we employed models using the same set of explanatory variables as in the previous sections. We thereby find that our regression results (not reported here) do not change and are hence not sensitive to the fact that two subindexes are measured on a 1 to 3 scale only.

6   Conclusion

Various features of existing stock option programs have been heavily criticized by shareholder activists and institutional investors. It is argued that the design of many stock option programs is an example of rent-extraction and managerial self-dealing, and illustrates the inability of existing corporate governance mechanisms in monitoring executives. There is also increasing criticism by academic scholars which argue that both the escalation and the design of stock option compensation reflect managerial rent-seeking rather than optimal contracting (see Bebchuk and Fried, 2003, 2004 and Bebchuk et al., 2002). Based on these critical views, we investigated empirically whether there really exists an association between the design of employee stock option programs and corporate governance structures. We tried to explain the observed variation in the design of ESO programs with differences in governance schemes. Simply put, we examined whether firms with weak corporate governance have stock option programs that are poorly designed from an economic point of view.

To perform this task, data on European stock option programs provided a promising basis. Compared to stock option plans in the U.S., European programs show much larger variation. They therefore provide a natural environment for an attempt to test the managerial power approach. We analyzed the association between the stock option design and corporate governance structures using detailed data on the option programs of corporations belonging to the DAX 30, the Euro Stoxx 50, and the Stoxx 50. Our main results can be summarized as follows. We found that cross-sectionally, *ownership variables* are related

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[53]Recall that each of these two subindexes ranges from 1 to 3 only, while the others range from 1 to 5. We therefore assigned the values 1, 3 and 5 instead of 1, 2 and 3 to the realizations of the variables *Participation Structure* and *Transparency*.

to the ESO design in a way that is consistent with the managerial power/rent-extraction view. When ownership concentration is low and the exposition to the U.S. capital market little, executives extract rents by designing poor ESO programs. Further support for this view is provided by the finding that firms with weaker creditor rights more often have badly designed stock option plans. Our findings further suggest that ineffective *board structures* (insider-dominated boards) are related to the stock option design in a way that supports the arguments and predictions of the self-dealing view: firms with few outsiders have worse programs on average. We therefore extended the existing literature by explicitly showing the importance of corporate governance structures for an explanation of the variation in the design of stock option programs.

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