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ANTECEDENTS AND CONSEQUENCES OF CORPORATE GOVERNANCE REFORM: THE CASE OF GERMANY

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The paper examines the antecedents and consequences of the voluntary adoption of corporate governance reform in firms embedded in a relationship-based governance system with less protection of minority shareholders. In such locations, ownership structure should be a key determinant of governance reform. Firms with dispersed ownership are likely to face agency problems but may lack sufficient ownership power in the hand of external owners for adoption to occur. Extensive ownership by external parties facilitates adoption but decreases the need and motivation to adopt governance reform. We examined the adoption of stock-based incentive plans and transparent accounting regulations (e.g., greater disclosure to shareholders) among large German firms (DAX 100) during the late 1990s. We found an inverse 'U'-shaped relationship between ownership concentration and governance reform. In addition, we found that firms adopting governance reform were more likely to engage in corporate divestitures and achieve higher levels of market performance than firms not adopting governance reform. Copyright © 2003 John Wiley & Sons, Ltd.

Historically, the corporate governance of Anglo-American firms has differed dramatically from that in many other regions of the world (Walsh and Seward, 1990). For instance, in many European countries, ownership concentration is significantly greater than in the United States and United Kingdom (Gedajlovic and Shapiro, 1998; Kaplan, 1994). Conversely, Anglo-American firms face greater institutional ownership of stock (Useem, 1996), active markets for corporate control (Hitt *et al.*, 1996), and strong executive performance incentives (Murphy, 1999), which have played a lesser role in European firms (Walsh and Seward, 1990). Notwithstanding these historical differences in ownership and control, governance mechanisms fashioned after those found in the United States are beginning to emerge in many European countries. Whereas the antecedents and consequences of agency control mechanisms in U.S. firms have been widely researched (e.g., Jensen and Meckling, 1976; Fama and Jensen, 1983; Eisenhardt, 1989; Walsh and Seward, 1990; Murphy, 1999), adoption of these mechanisms in countries with different ownership structures and governance norms remains largely unexplored. This study examined the causes of governance reform and its effects on firms' strategic actions and performance. Specifically, we study the adoption of stock-based pay and transparent accounting standards in Germany—a country where corporate governance reform has been cropping up with increasing frequency over the last few years (Figure 1).

The adoption of corporate governance changes is likely to be related to the nature of the agency problems in the firm. We focus our attention

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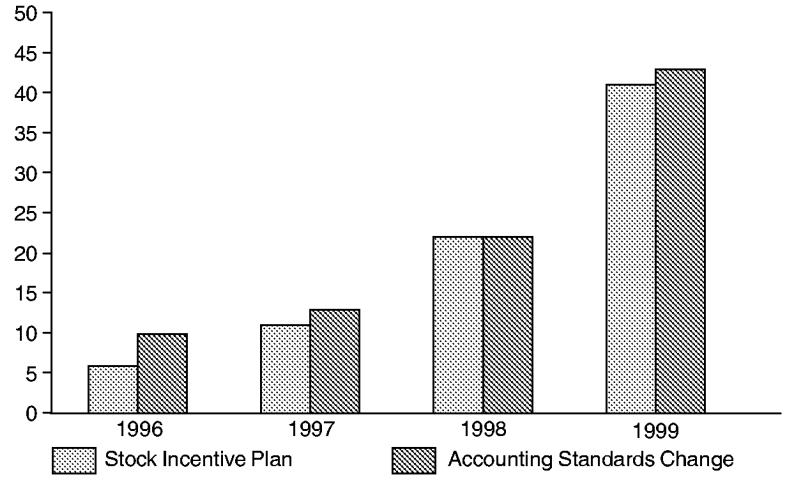

Figure 1. Adoption rates of stock incentive plans and new transparent accounting plans in Germany

specifically on one key determinant of agency risk and the likelihood of governance reform—firm ownership structure. Ownership structure is central to the field of corporate governance and possible agency problems (Fama and Jensen, 1983; Murphy, 1999; Shleifer and Vishny, 1997). Some theorists identify the separation of ownership and control as the source of potential inefficiencies and conflicts of interests (Berle and Means, 1932; Jensen and Meckling, 1976). Yet others also highlight that institutional and organizational solutions to this separation can result in efficient specialization of skills and capital (Fama and Jensen, 1983; Walsh and Seward, 1990). Research has documented a strong relationship between ownership and corporate strategy (Amihud and Lev, 1981), executive pay levels (Hambrick and Finkelstein, 1995), and restructuring (Bethel and Liebeskind, 1993). In addition, the effect of ownership structure on agency issues has also been studied in European contexts (Kabir, Cantrijn, and Jeunink, 1997; Thomsen and Pedersen, 2000).

By analyzing antecedents and consequences of governance reform in Germany, this paper contributes to the existing body of research in several ways: First, most research on agency control mechanisms has been conducted on firms operating in the United States and we know little about the spread of U.S.-style governance mechanisms around the world. Second, an important assumption of agency theory is that corporate governance mechanisms (e.g., incentives, monitoring) alter the behaviors of top executives (Larcker, 1983; Murphy, 1999; Sanders, 2001). Because governance reform is a relatively new phenomenon in Germany and only some firms have adopted the governance changes we study, this provides an interesting context in which to analyze the effect of governance reform on the investment activities of adopting firms. Third, many agency theorists assume that proper governance not only alters behaviors of top executives (e.g., investment decisions, effort), but that it has positive effects on firm performance as well (Jensen and Meckling, 1976; Shleifer and Vishny, 1997). Empirical evidence, however, shows a rather weak association between agency control mechanisms and firm performance (Jensen and Murphy, 1990; Murphy, 1999). Thus, we are not only interested in the effects of governance reform on firm investment activities but aim at contributing to the ongoing discussion on the relationship between governance and firm performance.

CONCEPTUAL DEVELOPMENT

In Germany, the context studied here, shareholder value is a relatively novel concept (Juergens, Naumann, and Rupp, 2000; Zajac and Fiss, 2001). Rather than having a focus on shareholder concerns, corporate governance in postwar Germany has had a broader, egalitarian focus—the protection of stakeholders' interests. Financial markets are less developed and the interests of minority shareholders are less protected than in the United States (La Porta *et al.*, 2002). Before specifically addressing the potential determinants and effects

of a move toward U.S.-style corporate governance, we first briefly review corporate governance practices in Germany.

A primer on corporate governance in Germany

The board

Quoted German companies have a two-tier board structure which is founded on the philosophy known as 'co-determination.' The supervisory board ('Aufsichtsrat') is the rough equivalent to the board of directors of firms in the United States and is structured according to the laws pertinent to co-determination. In publicly traded firms with at least 2000 employees, the law generally requires that board seats be allocated 50 percent to ownership interests and 50 percent to worker interests. The size of the supervisory board is dictated by statute according to the size of the firm. The management board ('Vorstand') resembles the top management team of firms in the United States. The management board reports to the supervisory board and is responsible for operational and strategic decision making.

Ownership and executive pay

Ownership patterns and executive pay practices in German firms differ from those commonly found among their counterparts in the United States. In contrast to the United States, ownership among German firms is still very concentrated. In 1998, an average of only 26 percent of the shares of the largest listed German companies was owned by non-blockholders (i.e., dispersed ownership) (Höpner, 2001). Gedajlovic and Shapiro (1998) reported that the ownership position of the single largest shareholder in their sample of 100 large and medium-sized German firms was 68 percent. These large blockholders are generally composed of banks, other large companies, and founding families (Gedajlovic and Shapiro, 1998; Gorton and Schmid, 2000). Blockholder ownership supports the board's monitoring efforts but exposes the firm to agency hazards as well, such as providing founding families with costly privileges and private benefits (Kets De Vries, 1996) and allowing dominant owners to use their power to gain rents at the expense of minority shareholders and creditors (La Porta *et al.*, 2002).

Historically, executive pay practices in Germany have also been distinct from norms in the United States. For instance, until recently, it was difficult under German law to offer stock-based incentive pay to top management. Consequently, firm profits have a comparatively lower impact on managerial compensation, and executive pay is typically not as volatile as it is in the United States (Kraft and Niederprum, 1999).

Accounting standards

Firms in the United States are required to file accounting statements that conform to standards established by the Federal Accounting Standards Board (FASB)—standards often referred to as GAAP (i.e., generally accepted accounting principles). In Germany, the historical accounting conventions that follow the rules of the German Handelsgesetzbuch (HGB) demand less disclosure than GAAP. In recent years, many firms in Continental Europe have moved toward international accounting standards (IAS), and some have even voluntarily adopted GAAP. Both IAS and GAAP require significantly more disclosure than HGB (MacDonald, 1999).

Other developments

Since the mid-1990s we have seen a change in German corporate governance. Various changes in German law (e.g., Raising of Equity Relief Act, Corporation Control and Transparency Act) strengthened the position of shareholders. Furthermore, several commissions were founded that developed corporate governance rules for quoted German companies with the intention of finding a balance between traditional principles of stakeholder value and the recently introduced principles of shareholder value.

Hypotheses

We are interested in why firms located in contexts characterized by large powerful external owners would adopt executive stock-based incentive plans and transparent accounting conventions. Which firms in these contexts are most likely to be early adopters of such changes? And how does the move toward a shareholder-value governance system affect the performance of firms? We see concentrated ownership as a vestige of the historic

stakeholder-value governance arrangements, and our hypotheses predict ownership concentration will have a strong influence on which firms emerge as early adopters of corporate governance reform. In this section we outline a mediated process whereby ownership concentration affects the adoption of governance reform, and this reform subsequently affects firm strategy and performance. The theoretical model is outlined in Figure 2.

Ownership structure and governance change

The emergence of shareholder-value-based corporate governance in the United States grew out of two related factors that are just now surfacing in other countries. First, concentrated family ownership gave way to dispersed ownership. Shareholders in firms with dispersed ownership faced a governance environment in which potential conflicts of interest were severe (Berle and Means, 1932). Decades later, formal modeling of the agency problem (Jensen and Meckling, 1976; Eisenhardt, 1989) led to a flood of subsequent prescriptive literature on solutions to these potential problems (Jensen and Murphy, 1990; Shleifer and Vishny, 1997; Rappaport, 1999) and many firms in the United States have adopted these prescriptions. For instance, in the years since the seminal articles on agency theory, the use of stock-option pay in the United States has escalated dramatically (Conyon and Murphy, 2000; Yermack, 1995). In many countries, including Germany, knowledge and understanding of the concept of shareholder value has only recently been introduced broadly. Consequently, in many regions ownership concentration is much greater than in the United States. However, there is typically significant variance in ownership conditions across firms even in countries with higher levels of concentrated ownership. And shareholders in non-Anglo-American locals are only now beginning to search for solutions to possible agency problems caused by dispersed ownership.

Stock-based incentives

In considering the adoption of stock-based incentives, we start with a few observations and assumptions about such forms of pay based on experiences of firms operating in the United States. First, stock-based incentive pay is generally added on top of (not in place of) salary and bonus pay (Conyon and Murphy, 2000; Yermack, 1995). Second, compensation consultants generally design CEO pay packages for the board (O'Reilly, Main, and Crystal, 1988). Because many of the large consulting firms practicing in the United States are also the dominant firms in other developed countries (e.g., Hay, Towers Perrin), we expect they will follow normative practices when structuring pay outside the United States and the United Kingdom. In addition, Anglo-American institutional investors have promoted the use of stock-based incentives among firms in the United States (cf. Useem, 1996), and we expect them to favor such management incentives when investing in Europe as well. Given that both institutional investors and executives should generally favor the adoption of stock-based compensation, why haven't all German firms adopted such forms of pay in the wake of legislative reform that allows it? Research in institutional theory suggests an answer to this question.

During early stages of the diffusion of organizational innovations, change is typically driven by efficiency rationale, while organizational change tends to follow symbolic and isomorphic patterns among later adopters (DiMaggio and Powell, 1983). For instance, Westphal and Zajac (1994) reported that early adopters of long-term executive incentive plans were more likely to use such plans extensively, while late adopters were more likely to use these incentive plans in symbolic style. Likewise, in studying the adoption of TQM, Westphal, Gulati, and Shortell (1997) found that early adopters customized TQM practice for efficiency gains, while later adopters gained legitimacy from adopting the normative form of TQM programs. We suggest the adoption of stock-based compensation to be driven largely by efficiency reasons in this early period of governance reform. And, we expect ownership structure to be one key indicator of the efficiency needs of early adopters. However, these effects may not be monotonic.

Small shareholders will likely be less committed to monitoring the firm's management than they would be if they held a larger fraction of equity (Alchian and Demsetz, 1972). In addition, dispersed owners often lack the necessary inside information and power to monitor management's actions and decisions effectively. Research suggests that stock-based incentives are a governance substitute for the monitoring efforts by large and powerful owners (Mehran, 1995; Zajac and Westphal, 1994). Stock-based incentives help

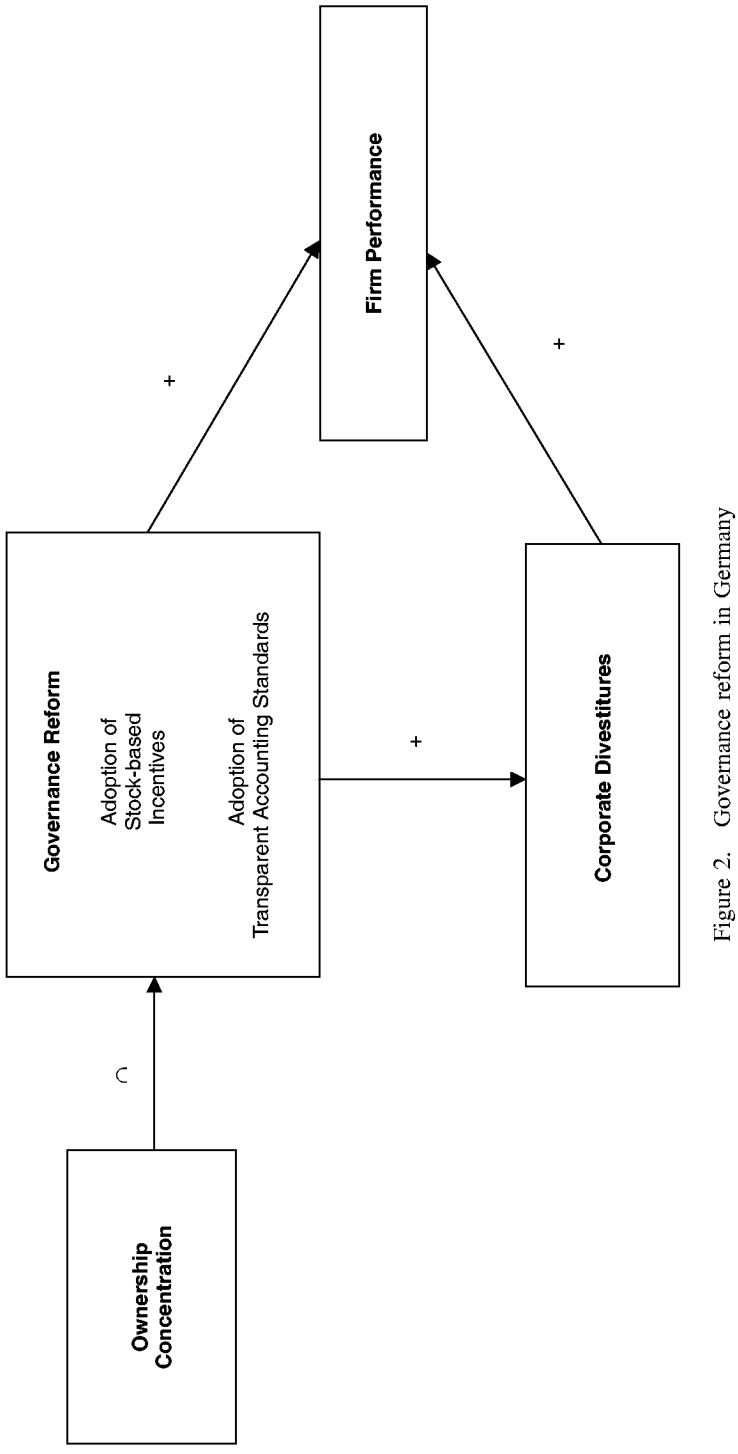

Figure 2. Governance reform in Germany

to align the interests of management and owners and thereby reduce the need for monitoring. Consequently, the firms with the greatest need to implement stock-based incentives are those with dispersed ownership. But the coordination of a decision in favor of stock-based incentives may prove difficult for small owners. In addition, some smaller owners are likely to lack information on the benefits of these unfamiliar incentives and might therefore hesitate to vote for an adoption. Thus, we expect that an increase in ownership concentration and power will support the adoption of stock-based incentives in firms with dispersed ownership.

Alternatively, concentrated ownership reduces the problem of monitoring because large owners control the board and have easy access to important inside information. Owners with substantial stakes can exercise considerable power and reduce the propensity of executives to act in self-serving manners (Berle and Means, 1932; Boeker and Goodstein, 1993). Thus, firms with concentrated ownership may not need stock-based incentives because monitoring improves the likelihood that executives will adhere to a shareholder wealth-maximizing agenda. Moreover, there are costs associated with stock-based incentives that powerful owners might want to forego. For instance, stock-option pay is more costly than other forms of pay because it can dilute shareholder ownership. Consequently, because external owners with significant shareholdings can monitor the firm effectively (Alchian and Demsetz, 1972), and stock-based incentive plans may add additional costs, firms with concentrated owners may be less likely to adopt stock-based incentive plans.

Taken in whole, for adoption to occur there must be sufficient ownership power in the hands of external owners, but extensive ownership by external parties likely decreases the need and motivation to reform. The preceding arguments suggest that significant ownership concentration reduces the motive for governance reform, but that some level of ownership concentration is necessary to grant external owners the power to implement governance mechanisms like stock-based incentive plans. This logic leads to the following hypothesis:

> *Hypothesis 1: There will be a non-monotonic inverse 'U'-shaped relationship between ownership concentration and the adoption of stock-based incentive plans.*

Transparent accounting standards

For board members and shareholders to monitor firm decisions effectively, they need accurate information (Fama and Jensen, 1983). Accounting disclosure statements are a crucial part of the information pipeline that facilitates much of this monitoring. Stringent accounting standards such as GAAP reduce information asymmetry by providing investors and outsiders with reliable, detailed information, thereby increasing transparency and reducing monitoring costs. Thus, the quality of information available to investors is heavily influenced by the rules by which firms construct their financial disclosure statements (Healy and Palepu, 2001). One problem faced by investors is that accounting disclosure standards vary across the globe (MacDonald, 1999).

European regulators have been attempting to unify accounting rules within the Continent and joining efforts to create international accounting standards (IAS). While the new IAS requires less disclosure than GAAP, both accounting standards are more stringent and demanding than the traditional German HGB accounting rules (MacDonald, 1999). IAS and GAAP require more financial disclosure and have fewer explicit accounting choices than HGB rules (Leuz and Verrecchia, 2000). As such, IAS and GAAP are more investor-oriented than HGB accounting conventions, which are regarded as protecting the interests of several non-owner stakeholder groups, especially those of creditors (Maret and Wepler, 1999). For international investors, it is easier to monitor companies that disclose their information according to IAS and GAAP than getting familiar with divergent national accounting standards in Europe. Consequently, IAS and GAAP reporting requirements reduce information asymmetry and improve and lower the cost of governance oversight.

Ownership structure is likely to affect firms' propensities to adopt voluntary yet stringent accounting regulations like IAS and GAAP. Dispersed owners often lack sufficient information on their firms' expected cash flows. Thus they are likely to profit from the comprehensive financial reporting that is provided by IAS and GAAP. Although dispersed owners have an incentive to overcome information asymmetries, their influence on management's disclosure decisions may be quite limited. Consequently, increasing ownership power will help dispersed owners to require

investor-oriented accounting regulations like IAS and GAAP.

Conversely, large and powerful owners may resist an adoption of transparent accounting practices. Powerful owners of firms that disclose their information according to HGB accounting conventions gain much of the information they need through the firm's internal accounting. Being used to HGB accounting rules, dominant owners may view the adoption of IAS and GAAP as unnecessarily intrusive and expensive. Dominant owners may, for instance, be afraid that the more transparent IAS and GAAP conventions provide their competitors access to too much information about the firm's current financial position and its future strategies. Moreover, the requirement to disclose quarterly reports may be viewed as enticing management to follow short-term strategies and, thus, as a threat to the firm's sustainability. Firms that decide to switch from HGB accounting standards to IAS or GAAP often have to disclose 'hidden reserves.' The additional taxes that are associated with disclosing a higher income are likely to be against the interest of large owners. Therefore, in firms with high levels of ownership concentration, adoption of transparent accounting conventions may be less likely than when ownership is less concentrated.

Reconciling these two sets of arguments, as with the adoption of stock-based incentives, we expect that the adoption of transparent accounting standards will be a function of ownership concentration. Some level of ownership concentration will likely be necessary to grant external owners the power to implement governance mechanisms like the adoption of GAAP and IAS. However, at high levels of external ownership concentration, large shareholders are likely to be less interested in transparent accounting. Stated formally:

> *Hypothesis 2: There will be a non-monotonic inverse 'U'-shaped relationship between ownership concentration and the adoption of transparent accounting conventions.*

The effects of governance reform

The emergence of corporate governance mechanisms that are designed to protect shareholders' interests should affect how top executives manage firms. The tremendous discretion of managers over corporate resources can compound agency problems. Financial incentives can bridle potential problems of discretion by affecting the attention and efforts of decision-makers (Eisenhardt, 1989). Consequently, stock-based incentives may affect firm performance (Jensen and Murphy, 1990). However, the incentive alignment hypothesis is inherently a mediated process; agents with proper incentives may behave differently than those lacking incentives (Wiseman and Gomez-Mejia, 1998), and this difference in behavior may ultimately lead to different performance outcomes.

Divestitures

Absent agency control mechanisms, managers have been shown to engage in conglomerate diversification that is not beneficial for shareholders. For instance, reasons for managements' interest in firm diversification include stabilization of managerial earnings streams (Holmstrom, 1979), a reduction of employment risk (Amihud and Lev, 1981), and an increase in prestige (Cannella and Monroe, 1997). Many researchers have suggested that excess diversification is preceded by inadequate governance mechanisms (Hoskisson and Turk, 1990; Bethel and Liebeskind, 1993; Johnson, Hoskisson, and Hitt, 1993). The use of divestitures is one way that firms can reduce excess diversification (Gibbs, 1993; Johnson *et al.*, 1993).

Stock-based incentives may lead managers to retract from overly investing in firm growth (Jensen, 1986) and firm diversification (Jensen and Murphy, 1990). In addition, stock-based pay can provide an incentive for downsizing efforts (Dial and Murphy, 1995). Existing research has found somewhat inconsistent effects in U.S. firms. Sanders (2001) reported, for instance, that stock option pay positively influenced management's divestiture propensity. Gibbs (1993) reported that managerial equity holdings were positively associated with corporate restructuring, including divestitures. However, Bethel and Liebeskind (1993) found no such effects. We argue that the implementation of new agency control mechanisms should increase the likelihood that firms will retract from excess diversification through the divestiture of business units.

Likewise, with additional accounting information provided by transparent accounting conventions, management's actions and decisions can be monitored more effectively. As a consequence, managers have less discretionary decision-making

power to overly invest in firm diversification. Moreover, firms that decide to disclose more information than required by traditional local rules allow for a more precise estimate of firm values. Because managers are held responsible for these values, they have an incentive to refocus the firm and to divest businesses that do not add to shareholder wealth (Ballwieser, 2001; Dial and Murphy, 1995). This logic leads to the following hypothesis:

> *Hypothesis 3: Firms that have previously adopted governance reform (e.g., stock plan adoption, accounting change) will more likely engage in corporate divestitures than firms lacking such governance reform.*

Performance effects

In addition to suggesting behavioral effects, the incentive alignment hypothesis presumes that these altered behaviors also lead to high levels of firm performance. However, research has typically found weak or non-existent relationships between chief executive pay and firm performance (Barkema and Gomez-Mejia, 1998; Gomez-Mejia, Tosi, and Hinkin, 1987; Kerr and Bettis, 1987). Recently, research has suggested that the inability of prior studies to detect a relationship between executive pay and firm performance may be due to the failure to account for how executive pay is structured *ex ante*. Specifically, firms that structure pay with equity forms of compensation should achieve higher levels of subsequent performance than those that do not (Jensen and Murphy, 1990). The results of several studies of firms in the United States are consistent with this hypothesis. For instance, Mehran (1995) reported that the percentage of total pay in stock-based incentives was positively associated with both Tobin's q and ROA.

We expect that the adoption of stock-based incentives in firms will be associated with high levels of performance (compared to non-adopting firms) because these incentives provide an *ex ante* contract for *ex post* settlement. This form of contract should provide strong behavioral motivation (Wiseman and Gomez-Mejia, 1998). However, it is important to note that outcome-based incentives can also be problematic, as they require decision-makers to accept the risk of bad decisions. Because executive decision-makers have all of their human capital invested in the firm, tying their pay to firm performance may subject them to too much firm-specific risk (Beatty and Zajac, 1994; Fama and Jensen, 1983; Holmstrom, 1987) and cause them to become too risk averse in their decision making. However, stock-based compensation represents an interesting mechanism for reducing the magnitude of the risk aversion problem. If supervisory boards grant stock-based incentives on top of cash forms of pay, they give executives financial incentives to increase share prices without making them subject to the risk of potentially excessively volatile pay levels. Consequently, stock-based pay probably does not normally transfer excessive risk to executives.

Although many executives in other countries have had less exposure to shareholder-value principles than their counterparts in the United States, we expect that as decision-makers they respond to incentives in similar ways. In firms where stock-based pay has been implemented, top management should have an increased focus on maximizing firm performance. Specifically:

> *Hypothesis 4a: The prior adoption of stock-based incentive plans will be positively associated with subsequent levels of firm performance.*

Research shows that adoption of transparent accounting conventions is associated with a reduction in information asymmetry, and thereby in the firms' cost of capital (Leuz and Verrecchia, 2000). We expect that the reduction in information asymmetry and the increased ability of shareholders to monitor associated with the adoption of accounting reforms will lead to higher levels of firm performance compared to non-adopting firms. Additionally, firms that adopt voluntary disclosure rules like IAS or GAAP send strong signals that they are well managed. Thus, independent of the effects of stock-based pay, we expect that the adoption of IAS and GAAP accounting standards will be associated with higher subsequent levels of firm performance:

> *Hypothesis 4b: The prior adoption of IAS and GAAP accounting standards will be positively associated with subsequent levels of firm performance.*

The governance rationale suggests that inadequate corporate governance allows managers to over-diversify and to overly invest in firm growth

(Hoskisson and Turk, 1990). Alternatively, de-diversification efforts through divestitures that are induced by shareholder-oriented changes in corporate governance should lead to favorable outcomes for shareholders. In addition, we have argued that we expect the adoption of stock-based incentives and transparent accounting practices will be positively associated with subsequent firm performance. If we are to infer that the behavior induced by these governance practices is favorable to shareholders, such behavior should be positively associated with firm performance. Consequently, we expect that firms engaging in divestitures will have higher levels of subsequent performance compared to those that do not divest:

Hypothesis 4c: Corporate divestitures will be positively associated with subsequent levels of firm performance.

METHODS

Data and sample

As noted earlier, the context of our study is Germany. We collected data on all firms in the DAX 100 for the years 1996 through 1999 and had complete data for 76 firms. Omitted firms were not statistically different from firms in the sample on dimensions of size or performance. Firm financial data were collected from annual reports; stock price information was collected from official publications in the finance pages of the *Frankfurter Allgemeine Zeitung*. Detailed information on executive stock-based incentive plans is difficult to obtain for many German firms because disclosure requirements are appreciably different from those in the United States. For instance, there is no current requirement that firms report the number of stock options granted to top executives. To compile information on stock-based incentive plans, we followed two strategies. First, we contacted the executive in charge of human resources in every firm in the sample and inquired about the adoption of stock-based incentive systems. Second, we obtained a proprietary research report of a large consulting company that detailed the adoption of stock-based incentive plans among large German firms. Comparing our data we found only one firm for which the data were contradictory. In this case, we contacted the firm a second time and clarified the discrepancy. Data on ownership concentration were obtained from *A Guide to Capital Links in German Companies* (edited by the Commerzbank, a German commercial bank), a book which contains information on ownership of German companies. Details about the accounting convention used by firms were collected from their annual reports.

Measures

Dependent and independent variables

We used an indicator variable to designate whether a firm had adopted a *stock-based incentive plan.* Both stock option plans and phantom-stock incentive plans were coded as stock-based incentive plans. If a firm had a stock-based incentive plan during the year, the variable was coded 1, and 0 otherwise. Due to data limitations mentioned earlier, we were unable to measure the size of stock-based incentive compensation grants. Consequently, we followed the procedure used in prior research investigating incentive effects of stock option pay when full detail of the plans was not known (Gerhart and Milkovich, 1990). To indicate whether a firm had adopted GAAP or IAS accounting conventions, we coded all firms' accounting conventions using indicator variables. If the firm adopted GAAP or IAS accounting conventions during a year, it was coded 1; it was coded 0 if the convention was HGB. Firms make explicit disclosures in their annual reports about the accounting method used. In some cases firms stated in their annual report that they disclose their information according to HGB rules but provide additional information in line with international reporting requirements or GAAP. The strict coding procedure we used was that if the firms report key figures like net income, assets etc. according to German accounting principles, they were counted as using HGB accounting rules. If, on the other hand, these key figures were computed according to the rules of IAS or GAAP, they were counted as using the more transparent method. We collected and coded these data on governance reform on a firm-by-firm and year-by-year basis.

Divestitures represent a significant form of corporate restructuring and thus result in the reconfiguration of a firm's portfolio of businesses (Gibbs, 1993; Bethel and Liebeskind, 1993; Johnson *et al.*, 1993). Our measure of *divestitures* is the number of divestitures completed during the year.

This type of a count measure has been widely used in studies of acquisitions, divestitures, and alliances (Ahuja and Katila, 2001; Hitt *et al.*, 1996; Sanders, 2001). We examined the robustness of the divestiture tests by substituting a measure of corporate *refocusing* for divestitures. Refocusing was calculated as the sum of unrelated divestitures and related acquisitions. We reasoned that firms that divest unrelated businesses and reinvested in areas related to the firm's primary industry might accelerate attempts to refocus on the core business.

We used three measures of firm performance; recent research has suggested using both market and accounting measures of performance helps to uncover relationships between firm outcomes and executive incentives (Finkelstein and Boyd, 1998). The measures of performance we used were return on sales (*ROS*), *market capitalization*, and the *market-to-book* ratio. This ratio measures how much value the market expects the firm to be able to extract from its pool of assets and is theoretically and empirically equivalent to Tobin's q (Perfect and Wiles, 1994; Varaiya, Kerin, and Weeks, 1987). In addition, it has been used previously in management research (Nayyar, 1993; Woo, Willard, and Daellenbach, 1992). We smoothed ROS over 2 years to avoid abnormal events or years from biasing the results (Miller and Leiblein, 1996). Market capitalization values were log-transformed. As noted below, in all instances we controlled for prior levels of firm performance. In addition, all measures of performance were adjusted by industry (Johnson *et al.*, 1993). Thus, performance is gauged relative to firms facing similar economic and competitive factors.

We calculated ownership concentration as the percentage of shares held in blocks of 5 percent, or more. Gedaljovich and Shapiro (1998) followed a similar approach. They used the same data source but calculated the percentage of shares outstanding held by the largest owner. Our results were not sensitive to whether we used total ownership concentration of five percent owners or just the largest shareholder.

Control variables

We included several control variables to account for alternative explanations. First, we included a control for *firm size* (log of the number of employees). Among firms located in the United States, firm size affects both how executives are paid (Henderson and Fredrickson, 1996) and firm performance. We included a control for *diversification level* (number of industries in which a firm operates), because diversification may affect the agency problems that confront the firm and the complexity of operations to be managed, both of which can have a bearing on how top executives are paid (Henderson and Fredrickson, 1996) and potentially affect the need for increased disclosure to shareholders. We included a control for *firm age* because firms become more inert as they age, and this may inhibit the adoption of governance reforms. Prior performance levels could influence governance reform, because low-performing firms may encounter more pressure to adopt new governance forms. Therefore, we included controls for prior performance (performance $t-1$) in models that predicted the adoption of stock-based incentive and accounting reform and in the divestiture models. In models that predicted firm performance, prior performance was also included as a control, but we used the instrumental variable technique to avoid specification problems (Johnston and DiNardo, 1997).

Finally, in models predicting the adoption of governance mechanisms and divestiture activity, we attempted to control for possible differences across industries (in performance models, the performance dependent variable is industry adjusted). We followed a procedure used by Amburgey and Miner (1992) to account for industry effects. First, we created dummy variables to indicate broad industry categories. We did so by using categories and industry membership as defined by the Deutsche Boerse, an equivalent of the SEC in the United States. We then ran a baseline regression analysis to determine whether any industries had significant effects. Finally, for any industries that did have significant effects in the industry-only models, we included those dummy variables in our full models.

Analyses

All of our models contain a lagged design; all independent variables were measured in $t-1$. We used three analytical models to test the various hypotheses. To test the effects of ownership structure on the adoption of governance reform, we

used a form of continuous-time event-history analysis with time-changing covariates and in which the dependent variable is the transition from one state to another. In this case, the transitions of interest are the adoptions of stock-based incentive plans and accounting practice reforms. We used a maximum likelihood Weibull distribution model parameterized as a proportional hazard model because it is suitable for modeling data with monotone hazard rates that either increase or decrease exponentially over time (Stata, 2001). In the proportional hazard model, the concomitant covariates have a multiplicative effect on the hazard function:

$$h(t_j) = h_0(t)g(x_j)$$

where $h_0(t)$ is the baseline hazard function and $g(x_j)$ is a non-negative function of the covariates and is equal to the relative risk: $g(x_j) = e^{x_j\beta}$. This specification is ideal because the model is applicable to time-varying covariates, delayed entry, and multiple events. Because we have complete data on adoption dates from the first adoption through 1999, there is no problem of left-censoring. However, because a little over 50 percent of the population had not adopted governance reform by the end of the sampling period, there is a potential problem associated with right-censoring. However, the method used provides reliable estimates even when many observations are right-censored (Allison, 1982).

To test the effects of governance reform on corporate divestitures, we used Poisson regression for panel data. This method is appropriate for situations in which the dependent variable is a count measure (Ahuja and Katila, 2001). Finally, to estimate the firm performance models, we used cross-sectional time-series linear models (i.e., xtgee in Stata) with a gaussian (normal) distribution. This is asymptotically equivalent to a weighted GLS model but is well suited for unbalanced data.

RESULTS

Table 1 contains a summary of the descriptive statistics. It should be noted that the descriptive statistics summarize panel data and the means are calculated across all firm-year data. Thus, descriptively, it is worth noting that the adoption of stock-based incentive plans and new accounting conventions are summarized more intuitively in Figure 1. Ownership concentration was considerably greater in these firms than that found in the United States. On average, ownership concentration averaged just over 45 percent, although there was significant variation in concentration.

Governance reform

Table 2 reports the results for the adoption of stock-based incentives and new transparent accounting conventions. Models 1 and 3 report

Table 1. Descriptive statistics and correlations

	Variable	Mean	S.D.	1	2	3	4	5	6	7	8	9
1	Stock plan adoption	0.30	0.46									
2	Transparent accounting plan adoption	0.35	0.48	0.31								
3	Divestitures	1.18	2.01	0.13	0.20							
4	Adj. ROS	−0.02	0.26	−0.08	−0.07	0.02						
5	Adj. Market capitalization (log)	0.09	1.44	0.27	0.35	0.38	−0.11					
6	Adj. Market to Book	0.01	0.97	0.15	0.00	0.09	−0.07	0.41				
7	Ownership concentration (%)	45.07	26.11	−0.29	−0.16	−0.26	0.09	−0.29	−0.10			
8	Firm size (log # employees)	3.07	1.34	0.06	0.18	0.51	−0.07	0.63	−0.01	−0.25		
9	Firm age	97.09	47.06	−0.01	0.03	−0.01	0.02	−0.05	−0.13	−0.11	0.10	
10	Diversification level	4.12	1.65	−0.03	−0.04	0.14	0.10	0.04	0.01	−0.06	0.15	0.09

Correlations greater than 0.20 are significant at $p < 0.05$, greater than 0.28 are significant at $p < 0.01$. $N = 76$

Table 2. Maximum likelihood survival-time analysis models for the adoption of stock-based incentive plans and new transparent accounting practices

	Stock-based incentive plan adoption		IAS and GAAP accounting adoption	
	Model 1	Model 2	Model 3	Model 4
Constant	−9.98***	−11.26***	−33.28***	−33.16***
	(3.04)	(3.14)	(5.51)	(5.46)
Firm size	−0.001	−0.0004	−0.015*	−0.02†
	(0.002)	(0.003)	(0.008)	(0.01)
Firm age	−0.002	−0.0003	0.0004	−0.00
	(0.004)	(0.003)	(0.004)	(0.004)
Prior performance (ROS)	0.87	1.18	5.02**	6.55**
	(1.69)	(1.68)	(1.94)	(2.35)
Prior performance (market capitalization)	0.16	0.16	0.47**	0.39**
	(0.12)	(0.12)	(0.15)	(0.15)
Ownership concentration	−0.02**	0.07*	−0.01	0.07*
	(0.007)	(0.04)	(0.01)	(0.04)
Ownership concentration^2		−0.0013**		−0.001*
		(0.0005)		(0.0004)
ρ	4.30	4.34	14.11	14.20
LR chi-squared	14.73**	22.94***	17.66**	22.36***

† $p < 0.10$; * $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$
For ease of interpretation, coefficients rather than hazard ratios are reported. Standard errors are reported in parentheses.

the control models with the main effect for ownership structure, while the full models with the squared term for ownership structure are reported in Models 2 and 4. In baseline models (not shown) that did not include the effect for ownership, we found that firms with high levels of market capitalization were more likely to adopt stock-based incentive plans. The effect was no longer significant after we added the effect for ownership. When ρ is greater than 1, it means that the hazard of adoption increases with time. In this case the likelihood of adoption increases dramatically. We found that ρ was greater than 1, thus the likelihood of adoption increased with time and, in these cases, increased dramatically. After 4 years, the likelihood of adopting a stock-based incentive plan is almost 10 times greater than after 2 years. (Specifically, to calculate the increased hazard of adoption over time, one divides the latter time by the earlier time and raises the quotient to the power of $\rho - 1$: $(4/2)^{4.30-1}$).

We predicted that ownership concentration would have a non-monotonic (inverse 'U')-shaped relationship with the adoption of stock-based incentive plans (Hypothesis 1). As noted in Model 1, the coefficient for the main effect of ownership concentration was negative and significant ($p < 0.01$). However, after the squared term was added in Model 2, the main effect was positive, while the coefficient for the squared term was negative and significant ($p < 0.01$). Thus, Hypothesis 1 was supported. We found that firm size was negatively associated with the adoption of transparent accounting conventions, while both measures of firm performance had positive associations (Model 3). Hypothesis 2 predicted that ownership concentration would have a similar non-monotonic (inverse 'U')-shaped relationship with the adoption of new accounting conventions. As reported in Model 4, we found support for Hypothesis 2; the coefficient for the main effect of ownership concentration was positive and significant ($p < 0.05$), while the coefficient for the squared term was negative and significant ($p < 0.05$).

Divestitures

Table 3 reports the results for models that estimate corporate divestiture activity. Similar to results found in studies of U.S. firms (Bethel and Liebeskind, 1993; Gibbs, 1993), firm size was positively associated with divestitures. We also found a non-monotonic relationship between ownership structure and divestiture activity (Model

Table 3. Poisson regression results for the effects of governance reform adoption on corporate divestiture activity

	Model 1	Model 2
Constant	0.76	−10.81***
	(0.73)	(0.73)
Firm size	0.65***	0.62***
	(0.07)	(0.07)
Firm age	0.001	0.001
	(0.001)	(0.002)
Prior performance (ROS)	−0.36	−0.18
	(0.32)	(0.31)
Prior performance (market capitalization)	0.04†	0.03
	(0.02)	(0.02)
Diversification	−0.004	0.02
	(0.05)	(0.05)
Ownership concentration	0.02*	0.02*
	(0.007)	(0.01)
Ownership concentration^2	−0.0003**	−0.0003*
	(0.0001)	(0.0001)
Stock incentive plan adoption		0.32***
		(0.10)
Accounting plan adoption		0.05
		(0.13)
Wald chi-squared	117.10***	130.15***

†$p < 0.10$; *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$
Standard errors are reported in parentheses.

1). Hypothesis 3 predicted that firms which had previously adopted governance reform (e.g., stock-based incentives and accounting convention) would engage in more corporate divestitures than firms which had not adopted governance reform. As reported in Model 2, the main effect for prior adoption of stock-based incentive plans was positive and significant ($p < 0.001$). However, the coefficient for the prior adoption of new accounting conventions was not significant. Consequently, Hypothesis 3 received partial support. When we substituted the measure of corporate refocusing for divestitures, we found similar positive effects between stock-based pay and refocusing activity.

Firm performance

The models that predict firm performance are reported in Table 4 (Hypotheses 4a–c). Recall that in these models we control for prior levels of performance using instrumental variables and that measures of firm performance are adjusted for industry. Thus, the results in these models can be interpreted as the effects of governance adoption and divestitures on changes in relative performance. In these models, the squared term for ownership concentration did not increase model fit. Consequently, because we made no prediction about the direct relationship between ownership concentration and firm performance, we include only the main effect as a control in Table 4. The effect of ownership concentration was negative and significant in two of the control models (market capitalization and market-to-book).

Hypothesis 4a predicted that the adoption of stock-based incentive plans would have a positive association with subsequent levels of firm performance. We found the expected positive association in the model that predicted market capitalization (Model 4) and market-to-book (Model 6), but a negative association in the model that predicted ROS (Model 2). Hypothesis 4b predicted that prior adoption of new transparent accounting conventions would be positively associated with subsequent levels of firm performance. Again, we found the expected positive association in the model predicting market capitalization (Model 4), but a negative association in the model that predicted ROS (Model 2). The effect was positive but not significant in predicting market-to-book (Model 6). Hypothesis 4c predicted a positive association between prior divestiture activity and firm performance. We found that the association between divestiture activity and market-to-book was positive ($p < 0.01$). In the case of ROS and market capitalization, this association was positive but not significant. We conducted two *post hoc* tests to further examine the effects of divestitures. We reasoned that the market may favorably receive divestiture activity to a point, but may not appreciate extreme levels of portfolio churning (Sanders, 2001). Thus, we added the squared term for divestitures. We found that the main effect for divestitures was positive and the squared term was negative. The coefficients for both these terms were statistically significant and the overall model fit improved significantly. Second, when the divestiture measure was replaced with the refocusing measure (discussed above), we found significant effects for both market capitalization and market-to-book models (i.e., positive main effect and negative effect for the squared term).

Table 4. Cross-sectional time-series linear regression of the effects of prior governance adoption and restructuring activity on relative (industry adjusted) firm performance

	ROS Model 1	ROS Model 2	Mkt. Cap Model 3	Mkt. Cap. Model 4	Market-to-Book Model 5	Market-to-Book Model 6
Intercept	−0.04	−0.04	−5.20	−0.59	−0.13	−0.03
	(0.15)	(0.15)	(3.19)	(3.03)	(0.60)	(0.59)
Firm size	−0.02	−0.01	0.69***	0.77***	−0.04	−0.07
	(0.02)	(0.02)	(0.17)	(0.16)	(0.08)	(0.08)
Firm age	−0.004	0.004	0.13	0.003	0.08	0.04
	(0.03)	(0.03)	(0.13)	(0.12)	(0.11)	(0.11)
Diversification	0.02*	0.02†	−0.05	−0.06	0.01	−0.005
	(0.01)	(0.01)	(0.07)	(0.07)	(0.01)	(0.05)
Prior performance	0.36†	0.31	0.09	−0.07	0.05	0.13
(instrumental variable)	(0.20)	(0.26)	(0.15)	(0.14)	(0.18)	(0.18)
Ownership concentration	−0.001	−0.001	−0.007*	−0.005	−0.02***	−0.01**
	(0.001)	(0.001)	(0.003)	(0.003)	(0.005)	(0.005)
Stock incentive plan		−0.07*		0.33***		0.20*
adoption		(0.03)		(0.10)		(0.10)
Accounting plan		−0.10**		0.38***		−0.14
adoption		(0.04)		(0.12)		(0.12)
Divestitures		0.01		0.08		0.19**
		(0.02)		(0.07)		(0.07)
Divestitures^2		−0.002		−0.009		−0.02*
		(0.002)		(0.009)		(0.01)
Wald chi-squared	7.45	23.66**	88.51***	126.91***	13.98**	21.41***

†$p < 0.10$; *$p < 0.05$; **$p < 0.01$; ***$p < 0.001$
Standard errors are reported in parentheses.

Mediated incentive effects

The model and hypotheses we have outlined suggest that firm investment activity mediates incentive effects. To test for this mediation, we followed the four-step analytical process (Baron and Kenny, 1986; Carpenter and Golden, 1997). First, the model is examined without either the direct ($x1$) or mediating effect ($x2$). Then, $x1$ and $x2$ are added independently to the model. Finally, both $x1$ and $x2$ are added. Mediation is inferred if model fit improves over the baseline as each independent effect is added independently and if the strength of the effect for $x1$ is reduced when both effects are in the model simultaneously. We found evidence to support this mediated process between the prior adoption of stock-based incentive plans, corporate divestiture activity, and firm performance.

Post hoc analyses

We conducted several *post hoc* analyses to assure that the quadratic terms captured the true form of the relationships reported in Tables 2 and 3. Because quadratic terms are complex interactions, we followed the guidelines of Jaccard, Turrisi, and Wan (1990) to analyze and plot their true effects. For ownership concentration, we first repeated the above-described analysis but added the cubed terms. The results of this *post hoc* analysis clearly suggested that the quadratic model represented a better description of the true relationships (in models including the cubed terms, neither the squared terms nor the cubed terms were significant). Then we plotted the relationships between ownership concentration and the adoption of both forms of governance reform and corporate divestitures over the range of values observed for ownership concentration and calculated the maximum points for the curvilinear effects. The maximum point represents the value for which $\partial y/\partial x = 0$. This can be computed from the information derived from the regression estimates using the following equation (Jaccard *et al.*, 1990: 53):

$$X_{\max} = \frac{-b_1}{2b_2}$$

where b_1 is the coefficient for the main effects and b_2 is the coefficient for the squared term. Solving this equation for ownership concentration revealed the maximum points to be 27 percent and 42

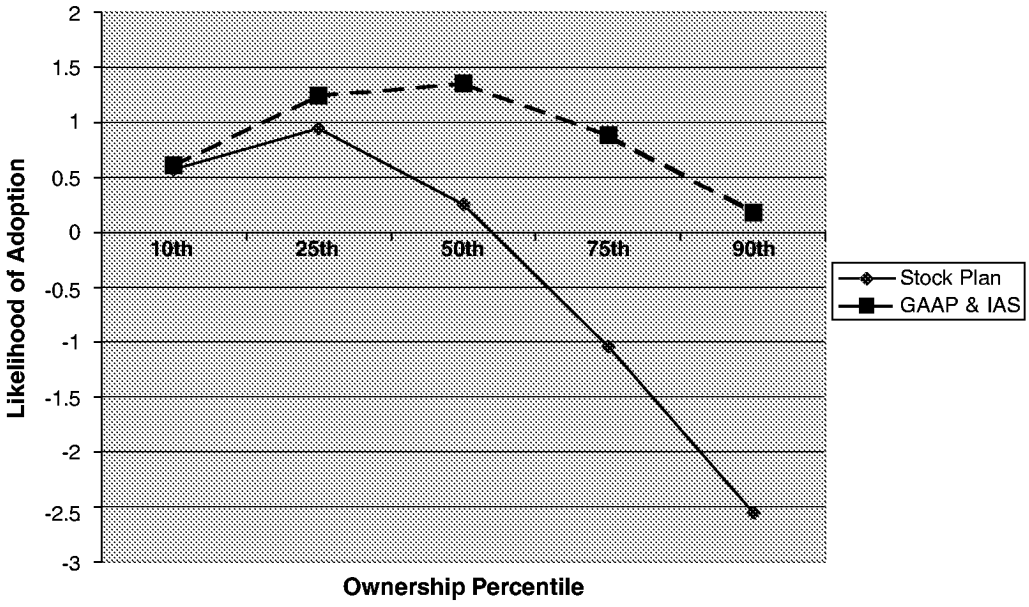

Figure 3. Ownership effects on governance reform

percent for stock-based incentive and accounting plan adoption, respectively (Figure 3, calculations based on actual values of the coefficients, not the rounded values shown on the tables).

DISCUSSION

The purpose of this study was to investigate some of the antecedents and consequences of corporate governance reform in firms headquartered in locations where agency control mechanisms have just started to emerge. The findings were supportive of the idea that ownership structure is an antecedent of early adoption of governance reform, and that such adopters appear to be driven by efficiency rationale.

It is worth noting that as long as stock-based pay is added on top of cash forms of pay, most executives should prefer to have stock-based incentives added to their compensation. Thus, the desirability of stock-based pay from the executive's point of view *does not* explain which firms adopt stock-based pay. We argued that one mechanism that would account for the adoption of governance reform was ownership concentration. For adoption to occur, there must be sufficient ownership power in the hands of external owners, but extensive ownership by external parties likely decreases the need and motivation to reform. Thus, adoption should be greatest in firms with moderate levels of ownership concentration—when both motive and opportunity simultaneously exist. In addition, firms adopting governance reform should display different resource allocation patterns and higher levels of subsequent firm performance compared to firms that do not adopt governance reforms. Again, the findings supported this mediated causal process.

The negative association between governance reform and ROS deserves some comment. While governance reform was positively associated with subsequent market capitalization and market-to-book, it was negatively associated with subsequent accounting returns. There are several possible explanations for this negative effect. First, it is possible that executives manipulate stock-based incentive systems in self-serving ways (Yermack, 1997). Firms with powerful executives may adopt stock option pay to take advantage of private information that could subsequently result in increased stock prices, or these executives may even engage in practices designed to inflate share prices at the expense of operating performance.[1] Second, it is possible that the adoption of stock-based incentives or transparent accounting practices may be behind this negative association with accounting returns.

[1] We thank an anonymous reviewer for suggesting this explanation.

For instance, in 1995 Daimler reported a positive income according to HGB but heavy losses according to GAAP. However, in general HGB is regarded as conservative and conventional wisdom would not support this contention, anecdotal evidence aside. In addition, some firms may be expensing their stock-based pay, thereby lowering net income. Finally, perhaps governance reform sparks a myriad of other corporate restructuring activities as well (Gibbs, 1993), some of which may have negative financial repercussions, such as recognizing one-time charge-offs to firms' income. Additional research is needed to determine why governance reform had negative associations with subsequent accounting measures of performance.

Contributions

The study contributes to the literature on ownership and governance in several ways. First, in contrast to much of the prior research on executive compensation, which treats executive pay level mainly as an outcome of interest, the findings of this study support the idea that agency control mechanisms are important precisely because they can alter firm investment choices and affect performance. Historically, the most common way scholars have examined pay-for-performance has been to examine the association of prior performance and current executive pay levels (Finkelstein and Hambrick, 1996; Murphy, 1999). However, scholars have recently argued that a potentially more fruitful way to study performance pay is to use the *ex ante* structure of compensation to predict subsequent levels of firm performance (Finkelstein and Hambrick, 1996; Mehran, 1995). Thus, our findings add to an emerging literature and offer empirical support for the idea that executive compensation structure can affect firm performance.

Second, the incentive alignment hypothesis inherently suggests a mediated process whereby incentives affect executives' behaviors and decision making (Murphy, 1999; Wiseman and Gomez-Mejia, 1998) and decisions are more likely to be in shareholders' interests when appropriate incentives are in place. By showing that stock-based incentives increased divestiture activity, the findings of this study highlight that how executives are paid can affect important resource allocation decisions. The findings of this study support the idea that incentives affect how resources are allocated, which then affects firm performance.

Finally, the findings illustrate the role of ownership structure in governance reform in a non-Anglo-American context. By studying governance reform in Germany, our study examined the robustness of shareholder protection mechanisms in a context where concentrated ownership structure is the norm and protection of minority shareholders has been low historically.

Limitations and future research

Like all empirical research, this study has some inherent limitations that affect how the results can be generalized to other contexts. For instance, while we found a pattern of results consistent with the hypotheses, additional research is needed to determine why governance reform had negative associations with subsequent accounting measures of performance. Our findings are limited in their generalizability because we focused only on large DAX 100 firms. Yet rules governing co-determination of the supervisory board vary according to the size of the firm. Adoption of governance reform may be different in firms with different supervisory board structures. Future research could examine the effects of board structure on governance reform by studying a broad sample of firms in Germany and other countries that historically support a stakeholder orientation. For instance, the sociopolitical make-up of the supervisory board (e.g., co-determination) may inhibit the full realization of governance reform because they are deemed institutionally illegitimate forms of organizational change (cf. Kraatz and Zajac, 1996; Zajac and Fiss, 2001). Often, prevailing norms and values need to be deinstitutionalized before new practices can diffuse. Ahmadjian and Robinson (2001) show, for instance, how downsizing strategies in Japanese firms were supported by a deinstitutionalization of permanent employment. Notably, there is some significant opposition to corporate governance reform in Germany (Bernhardt and Witt, 1997). Thus, future research could investigate the extent to which traditional stakeholder value norms have been deinstitutionalized in Germany (cf. Zajac and Fiss, 2001).

Although stock-based incentive pay is now finding its way into the compensation plans of large German firms, the nature of these plans still differs notably from that found in the United States. For instance, among German firms, (i) stock-based incentive pay is generally significantly lower than

it is in the United States, (ii) many firms require that their managers buy common stock shares before being issued stock options, and (iii) stock option pay is generally indexed—gains in share price do not result in option value unless the gains exceed that experienced by an index of similar companies (Dunsch, 1998). Ironically, the profile of the typical German stock option resembles that recommended by a number of advocates of executive pay reform in the United States (Crystal, 1991). Thus, as information becomes more readily available, further research should examine in detail the nature of stock-based incentives. The positive performance effects we found could be contingent on how stock-based incentive plans are structured.

Ownership structure and corporate governance play important roles in how top managers run publicly traded firms. The potential problems associated with the separation of ownership and control in public corporations has long captured the attention of researchers. While scholars in the United States have focused on the possible problems attendant with self-interested managers diluting shareholders' returns, the focus in many other countries has been on stakeholders generally. Consequently, agency control mechanisms are much less prevalent in Europe than in the United States. The results of this study add to the body of research on ownership and governance by demonstrating that even in locales with long and rich histories of governance by stakeholder orientation, ownership structure has strong effects on governance reform, and stock-based incentives have a powerful pull to focus executives' attention on the bottom line.

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