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TOP EXECUTIVES, TURNOVER
AND FIRM PERFORMANCE IN GERMANY

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ABSTRACT

This paper examines executive turnover -- both for management and supervisory boards - and its relation to firm performance in the largest companies in Germany in the 1980s. The management board turns over slowly -- at a rate of 10% per year -- implying that top executives in Germany have longer tenures than their counterparts in the U.S. and Japan. Turnover of the management board increases significantly with stock performance and particularly poor (i.e. negative) earnings, but is unrelated to sales growth and earnings growth. Turnover of the supervisory board is not consistently related to any measure of performance.

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1. Introduction

Corporate governance systems have received an increasing amount of attention from academics, the government, and the popular press. Most of this attention has focused on differences between the U.S. system and those of its strongest industrial competitors -- Germany and Japan. The U.S. corporate governance system is generally characterized as market or "short-term" shareholder oriented. Managers are monitored by an external market for corporate control and by boards of directors usually dominated by outsiders. The German and Japanese systems, in contrast, are characterized as relationship oriented systems. Managers there are allegedly monitored by a combination of banks, large corporate shareholders, and other intercorporate relationships. These relationships are maintained for long periods of time. The external market for corporate control is small, if not absent in these countries.

These differences in governance systems, in turn, are usually associated with differences in managerial behavior and firm objectives. One view, probably the majority view, argues that the close financial ties and relationships in Germany and Japan "reduce agency costs and allow investors to monitor managers more effectively than in the U.S."¹. According to this view, there are lower costs to changing poorly performing management because banks and large shareholders have the power to make needed changes. Costly hostile takeovers or proxy fights are avoided. Furthermore, because investors have better information and more power to use the information, firm managers are better able to ignore "short-term" market pressures and make value-maximizing "long-term"

¹ Grundfest (1990), Drucker (1991), Hoshi et al. (1990a and 1990b) and Prose (1990) are also sympathetic to this view.

investments. This view also is often associated with claims that German and Japanese firms are less concerned with or affected by short-term earnings, and, therefore, better able than U.S. firms to invest in projects with long-term payoffs. These supposed monitoring and information advantages have led some to call for the U.S. corporate governance system to imitate aspects of the German and Japanese system.²

In contrast, others argue an alternative view that the German and Japanese systems entrench managers and employees at the expense of shareholders. Banks, allied with incumbent managers, may receive abnormally high fees or interest rates in exchange for agreeing to bail out managers (and their companies) in cases of poor performance and financial distress even if not efficient to do so. According to this view, the German and Japanese successes are based on other factors.³

As suggested above, many observers have been quick to distinguish the U.S. system from its Germany and Japanese counterparts, and to draw conclusions about the nature of those differences. Most of these distinctions, however, are based on anecdotes, cases, and surveys.⁴ There is little systematic evidence on how the German and Japanese systems operate and how they differ from the U.S. system. Kaplan (1992) and this paper complement the anecdotal evidence and add to the limited systematic evidence on the nature and effects of governance differences. Kaplan (1992) examines the relation of managerial rewards and penalties to firm performance in Japan and the U.S.

² See Porter (1992).

³ See Baums (1992) and Coffee (1991) for a discussion of these views.

⁴ For example, see Lorsch and MacIver (1992), Baums (1992), or Kester (1992).

This paper follows the same strategy for a sample of large German firms, albeit with a more limited data set.

Specifically, I examine top executive turnover -- both for management and supervisory boards -- and its relation to firm performance in 42 of the largest companies in Germany in the 1980s. I find that the management board turns over slowly -- at a rate of approximately 10% per year -- implying that top executives in Germany have longer tenures than their counterparts in the U.S. and Japan.

Turnover of the management board increases significantly with poor stock performance and earnings losses. Such turnover, however, is unrelated to sales growth and earnings growth. Turnover of the supervisory board is not consistently to any of these performance measures.

Finally, I test for differences in the management board turnover-performance relations in firms controlled by large shareholders and firms whose voting rights are controlled primarily by banks. I do not find any systematic differences. It may be the case that most German firms are controlled and monitored by a combination of banks and large shareholders.

The results here parallel several of the results in Kaplan (1992). Poor stock performance and an inability to generate positive income increase the likelihood of top management turnover in Germany, Japan, and the U.S. The similarities are striking given the large structural differences in the governance systems in the three countries. The results strongly suggest that a successful or efficient governance system penalizes managers of firms with poor stock performance and with particularly poor current cash

flows.

The results here, in Kaplan (1992), and in Kaplan and Minton (1993) also call into question the view that the relationship oriented systems of Germany and Japan are able to ignore 'short-term' measures of performance. Current earnings and current stock returns are important determinants of management turnover in Germany, Japan, and the U.S. As noted by Kaplan and Minton (1993), there is a simple economic interpretation that can reconcile these results to the widely-held view that German and Japanese firms are more long-term oriented -- a company's current stock price and cash flows provide good measures of a company's current and future prospects.

The paper proceeds as follows. Section 2 describes the sample selection, data sources, and sample companies. Section 3 discusses executive and board structures in Germany. Section 4 presents evidence on the level of turnover; section 5 on the relation of turnover and performance. Section 6 concludes.

2. German companies

The sample of German companies is taken from the 61 included in Fortune Magazine's list of the 500 largest foreign industrials in 1980. Executive, financial, and shareholder information were obtained for 1981 to 1989 from Moody's International Manuals, Hoppenstedts Stock Guide, and, when available, company annual reports. Companies are excluded if they are more than 90% owned by a foreign company (e.g., IBM Deutschland) or did not report financial and management data. Nineteen such companies were excluded leaving a sample of 42. Of these 42 firms, 37 are stock

corporations or Aktiengesellschaft (AG) while 5 are private companies with limited liability or Gesellschaft mit beschränkter Haftung (GmbH). Because data -- particularly on stock returns -- are not available for all firms for all years, the number of observations in any year and in any regression varies.

Table 1 describes financial and governance aspects of these companies. Panel 1.1 presents data on sales and assets in 1983 and 1989. In 1983, the median firm is large with sales of DM 6.2 billion and assets of DM 4.6 billion. At a dollar-mark exchange rate of \$0.39 per mark, these would be \$2.4 billion and \$1.8 billion, respectively.

This paper focuses on five measures of performance: (1) sales growth; (2) stock returns; (3) change in net income as a fraction of total assets; (4) initial level of net income as a fraction of total assets; and (5) a dummy variable if net income is negative. The level of net income and the dummy variable for negative net income are intended to serve as rough proxies for financial distress. For example, negative net income indicates that a firm has not earned enough (in an accounting sense) to meet its operating and financial expenses.

Panel 1.2 reports the summary statistics for the performance variables used below. Sales for these firms grew by approximately 5% per year during this period while the ratio of net income to assets remained roughly constant.

3. Governance structures

The corporate governance system in Germany has four distinctive features.^{5,6}

⁵ This section relies on Baums (1992), Ernst and Whinney (1987), Lorsch and MacIver (1991), and Roe (1992).

First, all large firms are required by law to have a two-tier board system -- a management board (vorstand) and a supervisory board (aufsichtsrat). The supervisory board typically appoints the management board for a term of five years. During the five year term, the management board runs the company unless dismissed for cause by the supervisory board. The chairman of the management board in Germany is supposedly considered to be a first among equals rather than the first among lessers usually associated with U.S. chief executive officers. All of the management board members are firm insiders and managers of the firm; none of the supervisory board members can be current firm managers.

Second, the supervisory board operates subject to the codetermination system. One-half of the members of the supervisory boards of large corporations are appointed by shareholders while the other directors are appointed by employees and labor unions. Ties are broken by the chairman (of the supervisory board) who is appointed by the shareholders.

Third, the stock ownership of large German companies is more concentrated than that of large U.S. companies. For the sample in this paper, I was able to obtain shareholder concentration information on 38 of the 42 companies as of 1986 from Hauptgutachten der Monopolkommission (1988/89).⁷ Panel 2.1 indicates that, on average, fewer than 38% of a firm's shares are widely held. Almost 17% of shares are owned by other corporations (including banks) among the 100 largest in Germany; and

⁶ The discussion that follows applies specifically to AG's. The laws applying to GmbH's are technically different, but qualitatively similar.

⁷ The Monopolkommission report studies the 100 largest corporations (including banks) in Germany.

almost 28% are owned in large blocks held by families or management. The 28% owned by family or management blocks is particularly large relative to Japan and the U.S.⁸ The government, other corporations, and foreigners own the remaining shares.

Fourth, when shares are widely-held, German banks often have control of a large percentage of shareholder votes. The large German banks typically act as custodians for the shares of stock corporations held by small shareholders. As custodians, the banks are usually given proxies to vote those shares. Gottschalk (1988) reports that banks voted -- as custodians or owners -- more than 50% of the stock of 32 of the 100 largest German companies. The voting power of the banks usually translates into a seat (or seats) on the supervisory boards. Gottschalk finds that individuals with bank affiliations received 27% of the supervisory board seats available to capital in the firms where banks had voting control.

4. Description and turnover levels of executives and directors

This section describes the top executives in Germany and the length of time they typically serve in those positions.

4.1 Management board

Panel 2.1 of table 1 indicates that the firms in our sample have a median of 7 (average of 7.50) members on the management board. This is greater than the median 4 executive directors in large U.S. firms and the median 3 representative directors in

⁸ For example, see Kaplan (1992).

Japanese firms, but less than the median 21 directors of Japanese firms reported in Kaplan (1992).

Panel 2.2 presents evidence on management board turnover. In the period from 1981 to 1989, the likelihood that the chairman of the board of management loses his position is 10.95%, implying an average tenure of 9.13 years for the chairman. This average tenure is greater than the 6.90 years for Japanese presidents, but slightly less than the 10.28 year average tenure of U.S. CEOs found in Kaplan (1992).

The annual percentage turnover of the management board, or, equivalently, the likelihood that a member of the board of management loses his (or her) board position in a given year, is even lower, at 9.93%, implying an average tenure of 10.07 years. This is a lower probability of turnover (or a longer tenure) than the 12.4% for U.S. executive directors and 14.3% for Japanese representative directors found in Kaplan (1992).

Thus, among top executives in German, Japanese, and U.S. firms, those in German firms seem the most secure in their positions.

4.2 Supervisory board

Panel 2.1 of table 1 indicates that the firms in our sample have a median of 19 (average of 17.6) members on the supervisory board. This is greater than the median of 9 outside directors in large U.S. firms, and much greater than the median 0 outside directors of Japanese firms.

In the period from 1981 to 1989, the likelihood that the chairman of the supervisory board loses his position is 13.80%, implying an average tenure of 7.25 years

for the chairman. This average tenure is less than the tenure for the chairman of the management board. The likelihood that any member of the supervisory board loses his (or her) board position in a given year is lower, at 11.57%, implying an average tenure of 8.64 years. This is a shorter tenure than that for the typical member of the board of management.

5. Relation of turnover to performance

This section presents the key results of the paper -- the regressions of top executive turnover as a function of firm performance. The management and supervisory board regressions estimate the percentage turnover of the board as a function of performance using ordinary least squares (OLS). A separate regression is run for each performance measure, and, generally, its lagged value. Minimum logit chi-square estimates and logit estimates of individual director turnover generally produce economically and statistically similar results. The ordinary least square regressions are presented because they are easier to interpret.

To facilitate comparisons with the percentage turnover regressions, I report ordinary least squares regression coefficients for the chairman turnover regressions (with heteroscedastic-consistent standard errors). The coefficients from logit specifications are also reported.

Turnover is measured over one-year periods based on the directors reported in the annual Moody's International Manuals. In general, this turnover will be from one annual report to the next. Turnover is internal, because none of the sample companies

were taken over during the sample period.

Performance is measured over the current and previous one-year period. For accounting variables, current year results are those reported in the Moody's International Manuals based on the latest annual report. For stock returns, current year results are calculated over the last calendar year ending prior to the Moody's publication. All regressions include year dummy variables intended to control for economy- or market-wide shocks that vary over time. The performance variables, therefore, should be interpreted as performance relative to the market in a particular year. The tables do not report the coefficients for the year dummies.

Before proceeding, I should note three limitations of the analyses that follow. First, the regressions do not include a variable indicating whether the management board is in the last year of its (typically five-year) contract with the supervisory board. I have been unable to obtain such information. Second, I also have been unable to obtain information on the age of the executives. Finally, because several of the firms are closely-held or not publicly traded, the performance regressions using stock returns have roughly 40% fewer observations than the regressions using accounting variables.

5.1. Management board

Table 2 presents the results of regressions of (1) percentage turnover of the board of management and (2) turnover of the chairman of the board of management versus each of the five performance measures.

Turnover of the board of management is significantly related to poor stock

performance in both the current and previous year. The coefficients imply that a two standard deviation decline in excess stock returns (49%) increases the likelihood of management board turnover by 8.9% ($0.49 \times (0.080 + 0.103)$). This increase is economically large relative to the unconditional turnover of 9.9%.

Turnover of the chairman is not significantly related to poor stock performance. The coefficients in the chairman regression are, however, economically significant: a two standard deviation decline in stock price is associated with a 5.4% increase in turnover likelihood (relative to the unconditional likelihood of 11.0%).

Turnover of the management board and its chairman also both increase significantly in years in which firms record a loss of net income. The coefficients in the regressions imply that the likelihood of management board turnover increases by 9.5% in the year a loss is reported (significant at the 5% level); the likelihood that the management board chairman loses his job increases by 16.8% (significant at the 10% level)⁹.

The significant results for stock returns and negative income parallel those found in Kaplan (1992) for the top three to five executives in Japan and U.S. firms.¹⁰ For stock returns, Kaplan (1992) finds that a two standard deviation drop in stock returns is associated with an increased likelihood of turnover of representative directors in Japan of 5.9%; and an increased likelihood of turnover of executive directors in the U.S. of 4.6%. (The unconditional likelihoods of turnover are, respectively, 14.3% and 12.4%.) Both of

⁹ The significance level in the logit specification is at the 5% level.

¹⁰ The results reported in Kaplan (1992) differ from the results cited here because Kaplan (1992) presents results for two-year periods.

the Japanese and U.S. sensitivities, are smaller than the 9.7% increase implied by the German coefficients. For negative income, Kaplan (1992) finds that negative income is associated with an increased likelihood of turnover of 11.0% and 7.2%, respectively, in Japan and the U.S. These are comparable to the 9.5% increase in management board turnover found for German firms.

In contrast to the results for stock returns and earnings losses, turnover, both of the whole board and of the chairman, is not significantly related to sales growth, earnings growth, or the level of net income at the beginning of the year. In fact, five of the ten coefficients in these regressions are positive. This contrasts with the findings in Kaplan (1992) that Japanese and U.S. managers are more likely to lose their jobs for poor sales or earnings growth. One possible explanation for the generally insignificant results of the accounting variables is that German managers have more flexibility or opportunity to manipulate their financial statements.¹¹ As a result the financial statements of German firms will convey less information than those of Japanese and U.S. firms. Although possible, this explanation is not entirely satisfactory in light of the significant relation between negative income and turnover.

5.2 Supervisory board

Table 3 presents the analogous estimates of (1) percentage turnover of the supervisory board and (2) turnover of the chairman of the supervisory board versus each of the five performance measures. As with the regressions for the management board,

¹¹ See, for example, Salwen, "Breeders rejects Big Board plan to relax listing standard for foreign concerns," Wall Street Journal, May 3, 1991, C8.

separate regressions are estimated for each performance measure, and, when appropriate, its lagged value.

None of the coefficients on the performance variables in the regressions in table 3 are significantly different from zero at conventional levels. This is true for both the entire supervisory board and its chairman alone. Overall, these results do not indicate strong relations between supervisory board turnover and firm performance.

It is difficult to compare these results to those for Japan because Japanese firms typically do not have outside directors. Outsider appointed to boards of Japanese firm, typically become top managers of the new firm. Kaplan and Minton (1993) find that such appointments are strongly related to stock performance. In the German results, such a relation would be expected to show up in increased turnover of the management board, not the supervisory board.

The most comparable results for U.S. data are those in Hermalin and Weisbach (1988) for turnover and appointments of outside directors. Their results are mixed. They do not find a strong relation between departures of outside directors and either stock or earnings performance. They do find, however, a significant relation between additions of outside directors and firm stock returns.

5.3 Interaction with shareholdings and bank control of votes.

The previous sections indicate that only management board turnover is consistently related to performance. Most observers of the German system argue that large shareholders and banks play an important role in monitoring the management

board. If such monitoring occurs and its primary purpose is to discipline poorly performing managers, then turnover might be more strongly related to performance in firms with large shareholders and bank control. Alternatively, large shareholdings or voting control may give large shareholders or banks greater access to firm specific information. If monitoring occurs and its primary purpose is to direct company strategies, financial performance may be less informative about the true quality of management or state of the firm leading to a positive interaction of shareholdings (or voting control) and performance.

Hoshi, Kashyap and Scharfstein (1990a and 1990b) find evidence of this type of interaction: investment is less sensitive to internal cash flow and to financial distress for firms in financial keiretsu and with strong main bank relationships. Kaplan and Minton (1993) find mixed evidence. Managerial appointments of outsiders with corporate experience are more strongly related to poor performance in firms with large shareholders; however, managerial appointments of outsiders with bank experience are not differentially related to measures of bank lending.

In this section, I test for differences in turnover-performance relations as a function of shareholder and bank voting concentration. To measure shareholding concentration, I create a dummy variable -- widely-held -- that equals one if more than 50% of a firm's shares are widely held and zero otherwise. The results are not sensitive to the 50% cutoff. As noted earlier, I was unable to obtain shareholding information for four of the 42 firms. I assume these firms are not widely held. Under these definitions, seventeen of the forty-two sample firms are widely-held.

To measure bank voting control, I use results reported in Gottschalk (1988). He finds that banks voted more than 50% of the shares in thirty-one of the 100 largest corporations in Germany. I create a dummy variable that equals one if the sample firm is one of those thirty-one companies. Fourteen of the forty-two sample companies are among the thirty-one. Because I do not have information on bank voting control in the other twenty-eight firms, this variable is very noisy. It is also worth noting that the correlation between the two dummy variables for bank voting control and widely-held is large, equalling 0.65. The positive correlation is not surprising given that banks control votes when they act as custodians for small shareholders. Banks will tend to have more voting control in firms with more small shareholders, i.e., more widely-held stock.

Table 4 presents the results of four ordinary least squares regressions that include interaction terms. The dependent variable in the regressions is the percentage of management board turnover. The first two regressions use stock returns as the performance measure; the second two use negative net income. Given the noisy definitions of shareholder and bank voting concentration as well as the small sample size, this analysis should be considered exploratory.

None of the interaction terms in table 4 is statistically significant. One interpretation of these results (or lack thereof) is that bank voting control and concentrated shareholding are substitutes. When large shareholders are present, the large shareholders monitor management. When large shareholders are absent, the banks have voting control and the banks monitor management. Under this interpretation, the net effect is a relatively constant monitoring pressure on management.

6. Summary and discussion

This paper has examined top executive turnover -- both for management and supervisory boards -- and its relation to firm performance in 42 of the largest companies in Germany in the 1980s. The management board turns over slowly -- at a rate of 10% per year -- implying that top executives in Germany have longer tenures than their counterparts in the U.S. and Japan. Turnover of the management board (and its chairman) is significantly related to stock returns and earnings losses, but unrelated to sales growth and earnings growth. Turnover of the supervisory board (and its chairman) is not consistently related to any of these performance measures.

These results suggest three tentative conclusions. First, poor stock performance and the inability to generate positive income in the short-term -- and likely an inability to meet fixed financial obligations -- have a consistently negative effect on top management tenures. To roughly the same extent and significance, poor stock returns and income losses increase the likelihood of top management turnover in Germany, Japan, and the U.S. The results strongly suggest that a successful or efficient governance system penalizes managers of firms with poor stock performance and with particularly poor current cash flow.

Second, the results here, in Kaplan (1992) and in Kaplan and Minton (1993) also call into question the view that the relationship oriented systems of Germany and Japan are able to ignore 'short-term' measures of performance. Current earnings and current stock returns are important determinants of management turnover in Germany, Japan, and the U.S. This suggests a simple economic interpretation that may reconcile these

results to the widely-held view that German and Japanese firms are more long-term oriented -- a company's current stock price provides a good measure of a company's current and future prospects.

Finally, the relation of management turnover to stock returns and to negative income does not indicate that the German system favors employees and managers at the expense of shareholders in any obvious way.

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Table 1

Average and medians of firm financial and governance characteristics for 42 large German industrial companies listed in Fortune Magazine's 1981 list of the largest international companies (by sales). Governance data are for 1986 as reported in Hauptgutachten der Monopolkommission (1988/89). Board data reflect the fiscal year ending 1983 unless otherwise indicated.

	<u>Mean</u>	<u>Median</u>	<u>Std. Dev.</u>	<u>N</u>
<u>1. Financial Data</u>				
<u>1.1 Levels</u>				
<u>1983</u>				
Sales in fiscal year (DM)	11,093	6,199	11,786	41
Assets at end of fiscal year (DM)	8,202	4,623	9,343	41
<u>1989</u>				
Sales in fiscal year (DM)	15,699	8,851	18,339	34
Assets at end of fiscal year (DM)	12,090	5,904	15,396	34
<u>1.2 Panel Data - 1 year periods, 1981 - 1989</u>				
Sales growth (%)	4.84	5.12	12.87	301
Stock return (%)	15.42	16.58	33.80	212
Market excess stock return (%)	0.00	1.64	24.49	212
Change in net income to assets (%)	0.00	0.00	2.69	296
Initial net income to assets (%)	1.88	1.68	2.18	314
Net income is negative (%)	8.28			314
<u>2. Governance Data</u>				
<u>2.1 Levels</u>				
% of shares widely held (1986)	37.61%	45%	36.4	38
% of shares owned by the 100 largest corporations (1986)	16.76%	0%	30.7	38
% of shares owned by families or management (1986)	28.51%	2%	38.2	38
% of shares owned by government (1986)	6.58%	0%	23.3	38
Number of members board of management (1983)	7.50	7	2.66	42
Number of members supervisory board (1983)	17.63	19	4.15	38
<u>2.2 Panel Data - 1 year periods, 1981 - 1989</u>				
Board of Management: % chairman turnover per year	10.95%		(Implied Tenure 9.13 years)	
Board of Management: % director turnover per year	9.93%		(Implied Tenure 10.07 years)	
Supervisory Board: % chairman turnover per year	13.80%		(Implied Tenure 7.25 years)	
Supervisory Board: % director turnover per year	11.57%		(Implied Tenure 8.64 years)	

Table 2
Turnover of the management board and its chairman in one year periods

Univariate regression estimates of the turnover of the management board and the chairman of the management board as a function of stock returns, sales growth, earnings growth, and earnings levels for 42 large German industrial companies from 1981 to 1989. Regressions are univariate in the sense that a separate regression is run for each performance measure. All regressions include dummy variables for the time period. Management board coefficients are estimated by ordinary least squares. Chairman coefficients are estimated by ordinary least squares and by a logit maximum likelihood procedure. P-R² is the pseudo R² in the logit estimations.

Univariate regression estimates of turnover of the management board and its chairman

	Management Board		Chairman of Management Board			
	Ordinary Least Squares		Ordinary Least Squares		Logits	
	Coeff. [S.E.]	R ² [N]	Coeff. [S.E.]	R ² [N]	Coeff. [S.E.]	P-R ² [Log L]
Stock return:						
year t-1 to t	-0.060 ¹⁰ [0.046]	0.102 [161]	-0.110 [0.096]	0.043 [174]	-1.49 [1.13]	-46.6 [0.048]
year t-2 to t-1	-0.103 ⁵ [0.046]		-0.003 [0.082]		0.06 [1.00]	
Sales growth:						
year t-1 to t	-0.066 [0.083]	0.054 [237]	-0.076 [0.155]	0.039 [242]	-0.66 [1.72]	-82.2 [0.052]
year t-2 to t-1	0.057 [0.086]		0.243 [0.182]		2.16 [1.58]	
Change in net income / assets:						
year t-1 to t	0.494 [0.376]	0.058 [233]	0.875 [0.704]	0.028 [238]	11.01 [9.64]	-80.7 [0.041]
year t-2 to t-1	0.205 [0.485]		-0.069 [0.788]		1.71 [9.78]	
Initial net income / assets:						
Year t-1	-0.101 [0.408]	0.033 [292]	-1.068 [0.887]	0.027 [299]	-10.57 [8.30]	-95.7 [0.040]
Net income is negative:						
year t-1 to t	0.095 ¹ [0.034]	0.059 [277]	0.168 ¹⁰ [0.092]	0.042 [283]	1.29 ⁵ [0.82]	-92.4 [0.055]
year t-2 to t-1	-0.042 [0.028]		-0.063 [0.059]		-0.69 [0.57]	
Mean dependent variable	0.099		0.110			

Significantly different from zero ¹ at the 1% level; ⁵ at the 5% level; and ¹⁰ at the 10% level.

Table 3

Turnover of the supervisory board and its chairman in one year periods

Univariate regression estimates of the turnover of the supervisory board and the chairman of the management board as a function of stock returns, sales growth, earnings growth, and earnings levels for 42 large German industrial companies from 1981 to 1989. Regressions are univariate in the sense that a separate regression is run for each performance measure. All regressions include dummy variables for the time period. Supervisory board coefficients are estimated by ordinary least squares. Chairman coefficients are estimated by ordinary least squares and by a logit maximum likelihood procedure. P-R² is the pseudo R² in the logit estimations.

Univariate regression estimates of turnover of the supervisory board and its chairman

	Supervisory Board		Supervisory Board Chairman			
	Ordinary Least Squares		Ordinary Least Squares		Logit	
	Coeff. [S.E.]	R ² [N]	Coeff. [S.E.]	R ² [N]	Coeff. [S.E.]	P-R ² [Log L]
Stock return:						
year t-1 to t	-0.028 [0.044]	0.038 [149]	-0.061 [0.096]	0.065 [159]	-0.70 [1.06]	0.073 [-48.4]
year t-2 to t-1	-0.063 [0.043]		-0.065 [0.103]		-0.70 [1.02]	
Sales growth:						
year t-1 to t	-0.095 [0.076]	0.035 [221]	-0.031 [0.197]	0.018 [216]	-2.51 [1.66]	0.023 [-85.1]
year t-2 to t-1	0.047 [0.078]		-0.174 [0.175]		-1.62 [1.74]	
Ch. in net income / assets:						
year t-1 to t	0.211 [0.338]	0.028 [220]	0.311 [0.710]	0.015 [215]	2.74 [7.48]	0.018 [-85.3]
year t-2 to t-1	-0.163 [0.438]		-0.063 [0.998]		-0.28 [8.62]	
Initial net income / assets:						
Year t-1	-0.523 [0.370]	0.018 [274]	-0.954 [0.939]	0.017 [268]	-7.25 [7.54]	0.022 [-107.0]
Net income is negative at						
year t-1 to t	0.031 [0.033]	0.019 [259]	-0.009 [0.083]	0.014 [254]	-0.10 [0.68]	0.018 [-103.5]
year t-2 to t-1	0.029 [0.032]		0.042 [0.092]		0.32 [0.61]	
Mean dependent variable	0.116		0.138			

Significantly different from zero ¹ at the 1% level; ⁵ at the 5% level; and ¹⁰ at the 10% level.

Table 4
Interactions of performance with shareholding and voting variables

Ordinary least squares regression estimates of management board turnover in one-year periods as a function of performance and monitoring variables for 42 German firms from 1981 to 1989. Each regression includes either stock returns or negative net income, either a widely-held or bank voting control dummy variable, and the interaction of that variable with the performance variable. The widely-held (shareholding concentration) variable equals 1 if more than 50% of the shares are widely-held. The bank voting control variable equals one if banks control 50% or more of shareholder votes. All regressions include dummy variables for the time period.

Ordinary least squares regression estimates of percentage turnover of the management board

Independent variables:	Percentage turnover management board		Independent variables:	Percentage turnover management board	
	Coeff. [S.E.]	Coeff. [S.E.]		Coeff. [S.E.]	Coeff. [S.E.]
Stock returns:			Negative net income:		
same period	-0.042 [0.061]	-0.130 ⁵ [0.057]	same period	0.122 ¹ [0.043]	0.079 ¹⁰ [0.042]
one lag	-0.134 ⁵ [0.061]	-0.118 ¹⁰ [0.057]	one lag	-0.061 [0.042]	-0.053 [0.041]
Widely-held dummy	-0.041 [0.029]		Widely-held dummy	-0.025 [0.020]	
Stock returns x widely-held dummy:			Negative net income x widely-held dummy:		
same period	-0.058 [0.067]		same period	-0.074 [0.071]	
one lag	0.061 [0.069]		one lag	0.038 [0.070]	
Bank voting control dummy		-0.029 [0.028]	Bank voting control dummy		-0.026 [0.020]
Stock returns x bank voting control dummy:			Negative net income x bank voting control dummy:		
same period		0.108 [0.067]	same period		0.059 [0.077]
one lag		0.006 [0.070]	one lag		0.042 [0.073]
R ²	0.130	0.118	R ²	0.090	0.085
Mean dep. variable	0.099	0.099	Mean dep. variable	0.099	0.099
Obs.	161	161	Obs.	277	277

Significantly different from zero ¹ at the 1% level; ⁵ at the 5% level; and ¹⁰ at the 10% level.