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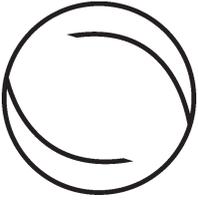
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# Power and Glory: Concentrated Power in Top Management Teams

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## Abstract

Strategic change is one of the most critical decisions that organizations make. We focus on the role of groups at the upper echelon of hierarchies and propose that concentrated power either in the CEO or the top management team is prone to be exercised, leading to a high rate of strategic change. We derive hypotheses on how formal and informal power concentration in top management teams have an effect on changes in corporate diversification. The findings suggest that power concentration strongly affects decision making.

**Keywords:** power, decision making, organizational change, top management teams

The strategic choice perspective in organizational theory sought to spur an interest in how organizational leaders use power and politics to influence organizational choices within the limits imposed by their context (Child 1972). Its key assumption of managerial choice has been incorporated in various theories of strategic behaviour, and perhaps most prominently in the upper echelon approach to studying strategic change (Hambrick and Mason 1984). Although this perspective maintains that top managers influence the rate and type of change in organizations, it has predicted change from a viewpoint of cognitive theory rather than power theory, and has especially emphasized the effects of top management team (TMT) heterogeneity in functional background, education and corporate tenure on the likelihood of large-scale organizational change. This is because diversity enhances 'the breadth of perspective, cognitive resources, and overall problem-solving capacity' (Hambrick et al. 1996: 662). Research in this tradition has found clear evidence that managerial diversity in characteristics that influence cognition affects choices (e.g. Williams and O'Reilly 1998; Bigley and Wiersema 2002).

Is there also evidence that internal power relations affect decisions? Work on decision-making processes regularly demonstrates effects of power use on decision outcomes (Pettigrew 1973; Courpasson 2000; Clark 2004), and thus suggests that an exclusive emphasis on cognition is not sufficient. However, much of this work has applied idiographic studies of single organizations and decision-making processes, which has not allowed identification of TMT structures associated with higher rates of change. This question is important because it has been suggested that power concentration in TMTs causes high risk taking (Hayward and Hambrick 1997) and misalignment with the environment (Miller 1991), although practitioners see power concentration as an important mechanism

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for rescuing low-performing organizations (Khurana 2002). Thus, there is broad agreement that power concentration is important for understanding rates of organizational change (Goodstein and Boeker 1991), raising the question of whether it is possible to identify TMT structures that lead to more, or less, concentration of power.

We wish to generate theory and evidence on how TMT tenure and rank distributions affect power concentration and thereby influence the magnitude of strategic change, and especially change that reverses the direction of prior strategic initiatives. We distinguish between formal power awarded to organizational positions and informal power arising from interpersonal interaction and exchange (Blau 1964). As we discuss below, longer tenure provides organizational members opportunities to cultivate social capital in organizations and develop organizational expertise, yielding greater informal power. The distinctive contribution of this study is our focus on the overall concentration of formal and informal power in TMTs in addition to the power balance between CEOs and other executives that has been examined earlier (e.g. Goodstein and Boeker 1991). We assess our predictions with an empirical investigation of a highly consequential form of organizational change: change in the diversification posture of large corporations. We do so because the case for investigating TMT heterogeneity is partly built on the claim that they influence such large-scale decisions (Hambrick et al. 1996), and we think a similar claim can be sustained for TMT power concentration.

More broadly, evidence that microstructures such as the power relations among a few people at the organizational apex have macro-organizational effects helps demonstrate the relevance of group theory for strategic management. Work on TMT diversity builds on micro-theory of similarity-attraction and information-diversity effects on decision making (Williams and O'Reilly 1998; Hodgkinson and Sparrow 2002), demonstrating that these mechanisms have effects in the field as well as in experiments. Similarly, our work builds on micro-theory of resource and status effects on deference in decision making (Emerson 1962; Berger et al. 1977; Cook et al. 1983; Ridgway et al. 1994) and aims to show that these mechanisms also have effects in the field.

Our emphasis on predicting organizational differences in change rates based on the structure of the TMT leads us to perform a longitudinal quantitative study of multiple firms in which we model differences in the change rates based on selected variables. We choose this nomothetic approach rather than an ideographic study of a single decision-making process because we are interested in whether structural conditions explain variation in change rates. We move beyond static structural models of power in our theory of how organizational changes result from TMT power, and in our analysis of longitudinal data incorporating change in TMT structures over time as well as controls for TMT turnover. Our focus on how TMT structures generate organizational change is still different from process studies that examine the mechanisms that lead to change (or inertia) (e.g. Elg and Johansson 1997; Clark 2004). We regard these two approaches as complementary, as each answers a different question.

## Theory and Hypotheses

### Power Effects on Organizational Change

Power is 'the ability to get things done the way one wants them to be done' (Salancik and Pfeffer 1977: 14). Power is a relational property describing the extent to which a given actor can control the behaviour of another actor by manipulating rewards important to the other (Emerson 1962). It follows from this view that the statement that an individual is powerful is meaningful only as shorthand for saying that the individual is powerful relative to certain others, so CEO power means the power that the CEO has over other members of the organization. Power is essential for producing strategic change because decisions to alter organizational strategies and structures affect internal actors with vested interests, and implementation likewise involves mobilization and deployment of resources controlled by multiple managers (Pfeffer and Salancik 1978).

Power in organizations is determined by authority relations specified by organizational rules and hierarchies, possession of resources that can be used to reward others, and deference gained through interpersonal hierarchies (Berger et al. 1977; Pfeffer 1981; Fernandez 1991; Brass and Burkhardt 1992). It is common to distinguish between the formal power that the organization vests in a position through assignment of decision-making authority and resources, and informal power that the person accumulates as a result of personal, relational or situational characteristics (Blau 1964). Formal power is attached to positions rather than individuals on the basis of an assumption that 'lower participants recognize the right of higher-ranking participants to exercise power, and yield without difficulty to demands they regard as legitimate' (Mechanic 1962: 350). Informal power is gained through possession of resources and information critical of others, knowledge and expertise gained through long tenure, a history of past successes that produces a reputation for power, cooperation with influential outsiders such as board members, and support from subordinates (March 1966; Pfeffer 1981; Miller 1991). The sources of formal and informal power do not always covary, however, as seen in surveys finding that hierarchy accounts for only a part of the variance in power reputations (e.g. Brass and Burkhardt 1992). Power is concentrated in organizations when a small number of members possess power derived from either formal or informal bases (Pichault 1995).

We examine how CEO power and TMT power concentration affects strategy change. First, we follow the lead of previous studies in examining whether CEO power over other executives affects decisions, as this helps demonstrate contests for power between CEOs and other executives (Finkelstein 1992; Ocasio 1994). Second, we examine whether decisions are affected by power concentration in the formal hierarchy of the TMT and its TMT tenure distribution, indicating concentration of formal and informal power, respectively. Finally, we examine whether match of formal and informal power affects the decisions.

We argue that concentration of power increases the likelihood of strategic change. Managers at the higher level of hierarchies have political motives to engage in strategic change because strategic change is an opportunity to reward

supporters, punish opponents and rebuild coalitions to reinforce their positions. Business area addition, removal and reorganization create a need for reassigning managers to positions, which can be used to promote supporters and sideline rivals. They also offer opportunities for managers to establish new rules and communication paths that enhance their current political positions.

Moreover, strategic changes have symbolic value because a high level of change indicates that the TMT has an active hand in strategy making. Change not only provides legitimacy to managers whose competence and capabilities as professional leaders might be evaluated by external constituents and organizational members (Pfeffer 1981; Courpasson 2000), but also develops reputations about their influence that may forbear opponents' attacks (March 1966). In addition to these political incentives to make changes, managers' inclination to favour strategic change may have a cognitive source (Hayward and Hambrick 1997). CEOs who have experienced significant success or been the subject of public praise may develop extreme confidence — hubris — that leads to progressively riskier strategic actions.

Finally, strategic change gives managers an opportunity to move organizations into strategic areas in which they can display their expertise and talents. By matching business domains with their own knowledge, skills and capabilities through strategic change, managers can justify their presence in the firms and enhance their own survivability in organizations.

In addition to these motives, powerful managers also have the means to initiate strategic change. Pfeffer (1981: 87) observed that 'when power is concentrated, political conflicts in goals and in definitions of technology are resolved by the imposition of a set of preferences and a view of technology which reflects the position of the dominant coalition controlling the organization'. Concentration of power enables powerful actors to limit the flexibility in interpreting organizational goals and external environments (Clark 2004; Davenport and Leitch 2005) and to develop norms and value systems in organizations that reflect their own preference, resulting in greater capability to lead organizations to where they want to explore. Because power gives managers both motive and means to make changes, powerful managers are likely to trigger strategic changes (Pfeffer 1981; Hickson et al. 1986; Hambrick and Finkelstein 1987; Denis et al. 1996; Hayward and Hambrick 1997). In the following, we develop predictions of effects of high CEO power and TMT power concentration on strategic change after noting how corporate diversification can be used to assess strategic change.

### **Diversification**

Corporate diversification is a highly suitable outcome for testing how power concentration affects strategic decisions. Entry into new business areas, exit from existing business areas and allocation of funds among existing business areas are decisions of corporate strategy (Finkelstein 1992; Pennings et al. 1994; Boeker 1997). They have long-term consequences for corporate returns and survival and great potential for intraorganizational conflict. Firms diversify to seek advantages of scope, leverage of firm-specific capabilities over several businesses, and learning across related forms of business (Chandler and Hikino

1990; Hitt et al. 1997). Firms retrench when their level of diversification results in overly high transaction costs, unproductive diffusion of practices across business units, and attention from corporate raiders (Williamson 1975; Chandler and Hikino 1990; Hitt et al. 1997). Managers of business areas have a clear self-interest when making proposals for their own funding and estimating the consequences of their proposals, and the weighting of opposing interests necessary for a decision can only be done at the corporate level. Thus, diversification is a decision where we should expect to see the influence of the CEO and TMT members. Indeed, change in diversification has been examined in earlier work on TMT decisions (Bantel and Jackson 1989; Wiersema and Bantel 1992; Hambrick et al. 1996; Ferrier 2001). Correspondingly, we make predictions on the magnitude of change in diversification.

We also make additional predictions that stem from closer analysis of the meaning of change. Organizations may change in ways that extend the current strategy rather than alter it (Miller and Friesen 1982; Kelly and Amburgey 1991). Decisions may be repeated, as when an acquisition is followed by another, or strategic positions may be extended, as when a foothold in a new industry is expanded (Amburgey and Miner 1992). Such changes are evidence of organizational momentum, which is change that is consistent with a strategic direction that the organization has already set and thus not a change of course. Changes that go against and break the organizational momentum, as when a firm that has previously increased diversification instead reduces diversification, are more radical changes (Mitsuhashi and Greve 2004). Thus we also make additional predictions on changes that break the organizational momentum, following the same logic as in our predictions for the magnitude of change because momentum breaking captures the extent to which firms reverse the direction of the change in the diversification.

### **CEO Power**

Our principal argument is that power concentration in a TMT leads to strategic change and change that breaks the organizational momentum. Power concentration plays a significant role in shaping group dynamics (Mannix 1993). We examine both formal and informal power sources, but because the CEO's formal power is a constant — the position as the highest executive of the firm — our first test of this argument focuses on CEO informal power stemming from social capital.<sup>1</sup> An individual holds social capital to the extent that others feel obliged to act favourably to him or her as a result of prior interactions (Coleman 1988). Social capital is built on the norm of reciprocity in exchanging favours, and thus can be accumulated when an individual with the ability to recognize opportunities to extend favours also has resources and motivation to do so. Exchange of favours is central in managerial work and career management, but all managers are not equally well positioned to accumulate and exploit social capital.

The high social capital afforded by long tenure in the organization is an important source of informal power (Barkema and Pennings 1998; Shen and Cannella 2002). Length of tenure is thought to be a good indicator of social capital because executives with longer tenure have had more time and opportunities

to develop interpersonal relationships (Barkema and Pennings 1998; Drazin and Rao 2002) and to build up obligations by helping peers and promoting subordinates (Milller 1991; Carpenter and Westphal 2001). Length of tenure is also related to centrality in social networks. Longer organizational experience gives CEOs informational pathways necessary for making appropriate strategic decisions and decreases their dependence on other members occupying low-ranking positions for information collection and analysis (Mechanic 1962). The expanded access helps the manager learn how to affect decisions through selective exchanges such as sharing of information and trading of favours (Pettigrew 1973; Burt 1992). Once social capital has been built to a level useful for influencing decisions, astute use will cause it to appreciate. Repeated exercise of power creates a reputation for being powerful, which diminishes resistance because others will be reluctant to oppose the powerful executive (March 1966).

While long tenure is an opportunity to amass social capital, it can be assessed more directly by examining the extent to which an individual manager has extended favours that others will be motivated to reciprocate (Ocasio 1994). An important mechanism is the use of promotions. A manager is interested in building a team of loyal subordinates, which is achieved most readily by using appointments and promotions to select a team of subordinates that the manager judges to be loyal based on past experience or because they depend on the manager to keep their position (Boeker 1992; Ocasio 1994). Managers who are astute users of the appointment mechanism can then build up social capital as a result of the career awards they bestow on others. Admittedly, appointments are only one form of favour that can be extended, and managers also use a variety of other helping behaviours such as providing political support in conflicts, sharing expertise and lending resources. Thus, while tenure indicates relative advantage in the accumulation of the social capital, appointments capture one of multiple approaches to gaining social capital.

As argued previously, the power gained through social capital can be displayed and strengthened through organizational change. Thus, the prediction is that managers with greater social capital will have higher intraorganizational power through their ability to muster support from allies. We will evaluate this prediction by measuring the length of CEO tenure and the proportion of executives appointed during the CEO's tenure, but state the hypothesis in general form:

*H1a: The CEO social capital increases the rate of changing the corporate diversification level.*

*H1b: The CEO social capital increases the rate of momentum-breaking change in the corporate diversification level.*

### **Power Concentration in Top Management Teams**

Other executives in TMTs also play critical roles in the formulation and implementation of strategies. Organizations consist of subgroups that seek to form coalitions to impose their own preferences in decisions (Cyert and March 1963), and the resulting game of coalition building and bargaining makes strategic decision making highly responsive to the ability of TMT members to influence

others. TMT power concentration refers to a situation in which a small number of TMT members possess excessive power derived from either formal or informal structures. TMT power concentration generates change for the same reasons that CEO power does: it is a means for generating change and provides a motive through the ability to use change for cementing the power position.

It is still worthwhile to note the mechanisms of power use in groups. Unequal power in a decision-making group reduces information exchange and debate (Ridgeway et al. 1994; Foddy and Smithson 1996). Less powerful members are prone not to voice their concerns or to be ignored if they do, leading to domination by the powerful members (Whyte and Levi 1994). Unlike decisions in egalitarian groups, which give results near the centre of the preference distribution of the group (Kameda and Davis 1990; Davis 1992), groups with unequal power make decisions near the centre of the weighted preference distribution, with the power of each member giving the weight (Mitsuhashi and Greve 2004). The decision will deviate significantly from the centre of the preference distribution if powerful individuals are off-centre. Moreover, preference change, power change or replacement of a powerful actor can cause large shifts in the weighted centre of preferences. Power concentration thus gives potential instability in the decision-making process.

Consistent with this theory, TMTs with concentrated power are more likely to initiate strategic change because change is a result of the preferences of the powerful few rather than a broad agreement (Hambrick and Finkelstein 1987; Pfeffer 1981). Indeed, there is some evidence of this from a case study comparing four enterprise restructuring processes and finding that the corporation with the most unequal power distribution (a 'cabal' of two managers) changed the most, and changed at a time in which it obtained greater power through owner support (Clark 2004). We examine both formal and informal sources of TMT power, as the formal ranking of members in TMTs differs among organizations. Organizations have hierarchies that vary in the number of levels and the distribution of members across levels in the TMT. Formal power concentration increases with hierarchical distances between positions in TMTs and is a function of the number of levels of hierarchies in TMTs and the skewness of the distributions of positions across the levels. In addition to the formal power associated with rank, TMT members acquire social capital through long tenure just as the CEO does. Both sources of power can affect decision making. Thus we predict:

*H2a: Formal power concentration increases the rate of changing the corporate diversification level.*

*H2b: Formal power concentration increases the rate of momentum-breaking change in the corporate diversification level.*

*H3a: Informal power concentration increases the rate of changing the corporate diversification level.*

*H3b: Informal power concentration increases the rate of momentum-breaking change in the corporate diversification level.*

Given that both formal and informal bases of power exist, it is useful to consider the possibility that different persons may be viewed as powerful depending on which base is considered. Mismatch of power bases would occur if a TMT member with long tenure had low hierarchical rank, for example, and would lead to a different decision-making process than when these power bases are matched. Mismatched power bases mean that contestation for power is likely, as it is unclear who will yield in a dispute between two members who each dominate the other on one criterion. Mismatched power may prevent rule by the few, as a full census of the opinions in the TMT becomes important when there is no small group that can demand deference from all others. Accordingly, we predict more change when the power sources are matched so that high hierarchical rank is associated with long tenure. The prediction is:

*H4a: Matching of power structures increases the rate of changing the corporate diversification level.*

*H4b: Matching of power structures increases the rate of momentum-breaking change in the corporate diversification level.*

## Methodology

### Sample

We use data from 10 firms in the Japanese shipbuilding industry and 9 firms in the Japanese robotics industry from 1975 to 1996. However, we use data prior to 1980 only for measuring momentum-breaking changes (see below). These firms constitute all firms on the primary list of the Tokyo and Osaka stock exchanges with shipbuilding or robotics as business areas. All firms were engaged in multiple industries, but both the shipbuilding and robotics part of the data include firms that were almost specialized in the focal business as well as highly diversified firms. The main businesses of shipbuilders outside shipbuilding were machinery, industrial plants and steel products. The main businesses of robotics firms outside robotics were computer and communications equipment and heavy machinery. The pattern of diversification suggests that the firms followed a strategy of leveraging their core competences in several industries. For shipbuilders, those competences were in engineering and manufacturing of complex steel structures using precision cutting and welding techniques. For robotics firms, they were in designing and manufacturing computing equipment and machinery, and in integrating the two. The firms did not appear to use diversification to reduce risk. Although both industries had highly variable demand because they manufacture industrial investment goods, the other markets these firms participated in were also for industrial investment goods and thus followed a similar business cycle.

We chose the shipbuilding and robotics industries in order to balance the advantages of an intensive industry study and a broader sample of firms. Having similar firms in the sample and panel data allows stronger controls for unobserved heterogeneity than broad samples of firms, and gives clearer causality

than cross-sectional designs. Single-industry studies are sometimes criticized for having low generalizability, however, so adding one industry allows tests of whether the results can be reproduced across industries. The two industries were thought to have different long-term prospects, as shipbuilders were facing increasing competition from low-cost nations, while robotics firms had a comfortable technological lead and an expanding market. Differences in the diversification patterns of declining and ascending industries might thus be seen in the shipbuilding versus robotics comparison. We calculated tests of whether the coefficient estimates differed by industry, and will, in the following, display findings from analyses that pool the data and note the differences we found when examining industries separately. The robotics and shipbuilding industries in Japan were world-leading in technology and market share, so it was natural to study Japanese firms when examining these industries.

Research assistants under the supervision of the authors collected the data from Japanese-language data sources, which give more precise recognition of names than when the names are transliterated into English. The research assistants and one of the authors are native Japanese speakers. In the data, each firm-year is an observation, and all independent variables are collected for the year before the dependent variable. Thus, all CEO power and TMT power concentration variables are recalculated for every year, and we also code variables for turnover of the CEO and TMT members to distinguish the effect of our structural variables from dynamic effects of CEO and TMT member turnover. The advantage of such data is that we compare across firms as well as within each firm over time, and we can thus use a model that separates firm-specific sources of change rates (such as from unique capabilities or products) from the effect of the TMT.

## Variables

### Diversification Change

The main dependent variable is change in product line diversification. The product line diversification is computed by the entropy index of the shares of the business areas of the firm (Hoskisson et al. 1993), which is the favoured measure of diversification, though the alternative Herfindahl index often gives similar results (Acar and Sankaran 1999). Our first dependent variable, *change magnitude*, is measured as the absolute difference in the index between time  $t$  and time  $t + 1$ :

$$C_1 = \left| \sum_i p_{i,t+1} \ln(p_{i,t+1}) - \sum_i p_{i,t} \ln(p_{i,t}) \right|$$

Here,  $i$  is an index of the product lines, and  $t$  is the time subscript. The product line data are coded from the annual Nikkei Directory of Firms.

Change measures are sometimes criticized, but in ways that do not apply to this measure. First, the most vigorous debate concerns the use of difference scores to indicate congruence with an optimal point, which is then used to predict performance (Edwards and Parry 1993). We use a difference score to measure change over time, as a dependent variable, and thus these problems are not relevant to our study. Second, many change measures have low reliability as a

result of high correlation with the level measures used to construct them (Bergh and Fairbank 2002). We have the opposite situation in which our measure of change in diversification has low correlation with the level of diversification (−.06 for shipbuilding, −.08 for robotics).

Our second dependent variable is *momentum-breaking change*, which equals the change in the product line diversification in the focal year minus the four-year moving average change in the product line diversification:

$$C_2 = \left| \sum_i p_{it+1} \ln(p_{it+1}) - \sum_i p_{it} \ln(p_{it}) - \frac{1}{4} \sum_{j=0}^3 \left( \sum_i p_{it-j} \ln(p_{it-j}) - \sum_i p_{it-j-1} \ln(p_{it-j-1}) \right) \right|$$

It thus captures the extent to which the TMT reverses the direction of the change in the diversification. According to this measure, an increase by 0.1 following four years with an average increase of 0.1 will give a zero change in the rate of change, while a year of 0.1 increase in diversification following four years of 0.1 decrease in diversification will give a 0.2 change in the rate of change. The reason for using this measure is that organizational momentum can cause organizations to continue changing the diversification in the same direction over multiple years (Miller and Friesen 1982; Amburgey and Miner 1992), so it is of interest to investigate whether these variables predict which TMTs break the momentum and reverse the direction of change. We refer to this dependent variable as *momentum-breaking change*.

#### CEO Power

We enter two measures to operationalize sources of CEO social capital. *CEO tenure* is the duration as CEO, measured in years. We also tried a logarithmic specification of this variable, but found that the linear specification had better fit. *Appointed by CEO* is the proportion of executives in TMTs appointed during the CEO tenure (Ocasio 1994).

#### Power Concentration

The data on TMTs are coded from the Directory of Firms, which gives their names, rank, function (if internal) or firm (if external) affiliation, and background data on age and education. As typical in large publicly owned companies in Japan, TMTs in firms in our sample consist of *Kaicho* (president)/*Shacho* (CEO)/*Fuku Shacho* (senior executive vice-president), *Senmu* (executive vice-president), *Jomu* (senior vice-president), *Torishimari-yaku* (director), and *Jomu Shikko/Shikko Jomu* (senior operating vice-president), in descending order of rank. These are all the ranks conventionally regarded as top management in Japanese firms (some firms use a subset of these ranks). We include executives who do not report directly to CEOs in order to fully examine the power distribution in TMTs. Executives below the senior vice-president rank have detailed operational knowledge not available to the top managerial layer and can potentially use this knowledge to manipulate or obstruct the decisions of the TMT (Crozier 1964; Pettigrew 1973), making their inclusion important for a full assessment of the power concentration.

The resulting management teams are larger than the groups used in most studies of group decision making. This is potentially problematic, but we believe that

our reliance on theory of power relations in the informal organization rather than group interaction theories such as similarity-attraction theory reduces the problem by giving face-to-face interaction in meetings a smaller role in the theory. In organizational decision making, politics, lobbying and consensus building can take place over an extended period of time before an important decision, which gives the power relations within the TMT ample time to produce their effects. Although these teams are larger than those examined in some prior work (e.g. Hambrick et al. 1996; Carpenter and Westphal 2001), the difference does not seem great enough to endanger the application of power theory.

Ranks are ordinal (ordered) but not cardinal numbers. To measure the concentration of formal power, we construct a measure of the expected hierarchical distance between two actors. The hierarchical distance is zero for members  $i$  and  $j$  on the same level, one for members at adjacent levels, two for members separated by one level, and so on. The measure sums the hierarchical distances and divides by the total number of relations, which is  $(n-1)n/2$ . Thus, to compute the expected hierarchical distance, assign all members  $n$  to one of  $c$  categories so that  $n_1, n_2, \dots, n_c$  is the number of members in each category and a higher category index implies higher rank (so 1 is the lowest). Then calculate the following:

$$CFP = 2 \left[ \sum_{i=1, c-1} \sum_{j>i} (j-i)n_i n_j \right] / [(n-1)n]$$

We adopt this measure for the concentration of formal power in the TMTs.

We measure the effects of concentration of informal power with the Gini index of tenure distributions in the TMTs. The Gini index equals the expected gain in a variable an individual could get if given the choice of trading places with a randomly drawn other individual, which yields the following formula:

$$CIP = (1/2n^2) \sum_{i=1}^n \sum_{j=1}^n |x_i - x_j| / (1/n) \sum_{i=1}^n x_i$$

Here  $x$  is the parameter,  $n$  is the number of actors, and the expression simply averages the differences in  $x$  for all pairs of actors scaled by the average  $x$ . It is larger for greater power concentration, and bounded by zero and one. The Gini index is the preferred measure for capturing inequality in a given variable (Blau 1977) and is widely used in inequality research (Lee 2005; Moran 2006). Because inequality is a result of skewed distributions of resources (e.g. wealth, rights, information, etc.), we adopt this index for measuring power concentration. In work on TMT diversity based on cognitive theory, measures such as the Euclidian distance or coefficient of variation (standard deviation divided by the mean) are conventionally used instead (e.g. Wiersema and Bantel 1992; Boeker 1997). The difference is that distance measures are concerned with horizontal (non-ranked) differences, whereas the Gini index assumes that the variable is ranked and treats upwards and downwards distances differently.

### Rank Match

To see how well the hierarchical rank and tenure position correspond to each other as proxies of formal and informal power, respectively, we compute the

Spearman rank correlation of these measures for each team in each year. A positive correlation means that executives highly ranked in hierarchies of the TMTs are also highly ranked in the distributional patterns of informal power based on tenure, so that the two criteria for ranking executives give similar rankings.

### Control Variables

We control for alternative explanations of strategic change and momentum-breaking change by including variables describing firms, TMTs and macroeconomic environments. *Shipbuilding* is an indicator coded as 1 when a firm is in the shipbuilding industry and 0 otherwise. *Firm size* is the logged assets of the firm, and *firm age* is the logged number of years since the founding of the firm. Both are expected to be negatively related to the rate of change (Hannan and Freeman 1977). *Firm performance* is the annual change in return on assets from time  $t - 1$  to time  $t$ . The *entropy index* of diversification at time  $t$  is entered, as the rate of change in diversification may depend on the current level of diversification.

The *number of executives* is entered to control for the group size effect on decision making. *Average tenure* is the average number of years of executives' service in the focal firms. The *proportion of finance executives* is the proportion of executives with a finance background, and is entered as a control for the greater propensity to change the business mix in firms dominated by the financial conception of the firm (Fligstein 1991; Finkelstein 1992).

*Market growth* is the growth in total sales of the focal industry from time  $t - 1$  to time  $t$  obtained from Lloyd's Register for shipbuilding firms and from the Japan Robot Association for robotic firms. *Interest rates* are included because they might influence diversification behaviour by affecting the financial cost of diversification. *Peer change of diversification* is the average change of diversification in the preceding year by other firms in the industry, and controls for mimetic strategic change.

Japanese boards of directors have a significantly lower proportion of outsiders than US boards, but tend to increase the proportion of outsiders in times of crisis, as one would expect if investors put outsiders on the board in order to assert their interest and monitor executives in troubled firms (Kaplan and Minton 1994; Kang and Shivdasani 1997). We therefore calculate the *outsider proportion* in order to control for effects of outside board members on diversification decisions.

Finally, we enter three turnover variables to control for changes in the TMT. *Newly hired CEO* is an indicator variable set to 1 if the CEO was hired two years ago or less. We investigated one- and three-year specifications of this variable and found that it did not affect the results, and it can also be omitted without changing any results. *Proportion entries* are the proportion of new (appointed last year) executives. *Proportion exits* are the proportion of executives who left the TMT last year.

### Descriptive Statistics

Table 1 shows the descriptive statistics for the analysis dataset. These firms are old and large on average, and their TMT members have long average tenure.

Table 1. Descriptive Statistics

|                                     | Mean  | SD   | Min.   | Max.  |
|-------------------------------------|-------|------|--------|-------|
| 1 Change magnitude                  | .05   | .08  | 0      | .65   |
| 2 Momentum-breaking change          | .07   | .11  | 0      | .72   |
| 3 Shipbuilding                      | .51   | .50  | 0      | 1     |
| 4 Firm size <sup>Logged</sup>       | 12.69 | 1.62 | 9.07   | 15.00 |
| 5 Firm age <sup>Logged</sup>        | 4.34  | .30  | 3.14   | 4.78  |
| 6 Firm performance (t-1 to t)       | -.34  | 4.21 | -59.06 | 16.88 |
| 7 Entropy index                     | 1.12  | .47  | .7     | 1.90  |
| 8 No. of executives                 | 24.76 | 8.22 | 7      | 40    |
| 9 Average tenure                    | 36.71 | 2.03 | 29.36  | 42.18 |
| 10 Proportion of finance executives | .01   | .02  | 0      | .08   |
| 11 Market growth (t-1 to t)         | .09   | .16  | -.22   | .65   |
| 12 Interest rates                   | 4.40  | 1.85 | 1.60   | 7.74  |
| 13 Peer change of diversification   | .07   | .07  | .01    | .37   |
| 14 Outsider proportion              | .16   | .14  | 0      | 1     |
| 15 Proportion entries               | .08   | .08  | 0      | .50   |
| 16 Proportion exits                 | .08   | .08  | 0      | .50   |
| 17 Newly hired CEO                  | .16   | .37  | 0      | 1     |
| 18 CEO tenure                       | 4.40  | 3.18 | 1      | 19    |
| 19 Appointed by CEO                 | .65   | .25  | .11    | 1     |
| 20 Concentration of formal power    | .47   | .10  | .18    | .69   |
| 21 Concentration of informal power  | .07   | .03  | .04    | .21   |
| 22 Rank match                       | .56   | .22  | -.46   | .93   |

*N* = 301

Given that, with a few exceptions, executives of the large and traditional Japanese firms are hired just after their graduation from university at the age of 22 or so and promoted from within, through internal labour markets (Doeringer and Piore 1971), the average tenure of 36.73 years suggests that the TMT members have an average age close to 59 years. With such a high average one would think that the dispersion would be small, and the standard deviation of the tenure is indeed only 1.98 years. The difference almost seems too small for effects of power concentration to appear, but Japanese TMTs have high homogeneity overall *and* high sensitivity to the differences that exist (Wiersema and Bird 1993). Power concentration based on formal hierarchies is moderate, with an average hierarchical difference of a half level. The concentration of informal power based on tenure is small on average, but varies across TMTs. The correlation matrix in Table 2 shows that the control variables have low correlations with each other and with the hypothesis-testing variables. The maximal variance inflation factor for the full model is 5.98, well below the threshold suggested in Chatterjee and Price (1991). We thus take no remedial action for multicollinearity.

### Statistical Method

The data have a panel structure with multiple firms and a time series of years for each firm. Such data can be used to control for various data problems that would bias estimates from cross-sectional data. The main questions are whether the observations have autocorrelated error structures, as would happen if the previous-period value of the dependent variable affected the current-period

Table 2. Pearson Correlation Coefficients

|                                     | 1    | 2    | 3    | 4    | 5    | 6    | 7    | 8    |
|-------------------------------------|------|------|------|------|------|------|------|------|
| 1 Change magnitude                  | 1    |      |      |      |      |      |      |      |
| 2 Momentum-breaking change          | .71  | 1    |      |      |      |      |      |      |
| 3 Shipbuilding                      | .25  | .31  | 1    |      |      |      |      |      |
| 4 Firm size <sup>Logged</sup>       | -.19 | -.23 | -.27 | 1    |      |      |      |      |
| 5 Firm age <sup>Logged</sup>        | .10  | .15  | .52  | .20  | 1    |      |      |      |
| 6 Firm performance (t-1 to t)       | -.15 | -.17 | -.08 | .10  | -.06 | 1    |      |      |
| 7 Entropy index                     | -.02 | -.04 | .08  | .56  | .21  | .07  | 1    |      |
| 8 No. of executives                 | -.23 | -.27 | -.28 | .87  | .16  | .11  | .51  | 1    |
| 9 Average tenure                    | -.16 | -.14 | .15  | .38  | .36  | -.05 | .47  | .40  |
| 10 Proportion of finance executives | -.02 | -.02 | -.01 | .11  | -.22 | .05  | .34  | .03  |
| 11 Market growth (t-1 to t)         | -.09 | -.13 | -.36 | .02  | -.26 | .02  | .08  | -.04 |
| 12 Interest rates                   | .10  | .09  | -.05 | .01  | -.09 | .17  | .13  | -.10 |
| 13 Peer change of diversification   | .21  | .28  | .64  | -.10 | .32  | .04  | .14  | -.15 |
| 14 Outsider proportion              | .15  | .20  | .20  | -.54 | .02  | -.05 | -.38 | -.46 |
| 15 Proportion entries               | -.01 | .01  | .14  | .02  | .13  | .14  | .11  | .02  |
| 16 Proportion exits                 | .03  | .04  | .16  | -.04 | .21  | -.05 | -.01 | -.05 |
| 17 Newly hired CEO                  | .00  | -.05 | .02  | .04  | .02  | .05  | .03  | -.01 |
| 18 CEO tenure                       | .05  | .12  | -.11 | -.07 | -.14 | -.09 | -.17 | .03  |
| 19 Appointed by CEO                 | .13  | .14  | .09  | -.31 | -.01 | -.04 | -.20 | -.23 |
| 20 Concentration of formal power    | .14  | .16  | .36  | -.21 | .05  | -.02 | .02  | -.20 |
| 21 Concentration of informal power  | .26  | .32  | -.02 | -.38 | -.03 | -.06 | -.37 | -.40 |
| 22 Rank match                       | -.09 | -.09 | -.15 | .38  | .07  | .15  | .35  | .40  |

|    | 9    | 10   | 11   | 12   | 13   | 14   | 15   | 16   | 17   | 18  | 19   | 20  | 21   | 22 |
|----|------|------|------|------|------|------|------|------|------|-----|------|-----|------|----|
| 9  | 1    |      |      |      |      |      |      |      |      |     |      |     |      |    |
| 10 | .00  | 1    |      |      |      |      |      |      |      |     |      |     |      |    |
| 11 | -.05 | .05  | 1    |      |      |      |      |      |      |     |      |     |      |    |
| 12 | -.14 | .09  | .41  | 1    |      |      |      |      |      |     |      |     |      |    |
| 13 | .07  | .00  | -.36 | .12  | 1    |      |      |      |      |     |      |     |      |    |
| 14 | -.20 | -.03 | -.14 | -.06 | .22  | 1    |      |      |      |     |      |     |      |    |
| 15 | -.15 | .08  | -.02 | .17  | .22  | .11  | 1    |      |      |     |      |     |      |    |
| 16 | .25  | -.12 | -.18 | -.18 | .12  | .10  | -.31 | 1    |      |     |      |     |      |    |
| 17 | .02  | -.01 | -.02 | .10  | .07  | -.03 | .01  | .08  | 1    |     |      |     |      |    |
| 18 | -.10 | .00  | -.04 | -.20 | -.17 | .01  | -.09 | -.09 | -.47 | 1   |      |     |      |    |
| 19 | -.23 | .02  | .09  | .10  | .07  | .23  | .12  | -.07 | -.37 | .30 | 1    |     |      |    |
| 20 | .09  | .06  | .00  | -.04 | .17  | .05  | -.12 | -.12 | -.05 | .04 | -.09 | 1   |      |    |
| 21 | -.57 | -.22 | .11  | .12  | .00  | .30  | .05  | -.08 | -.03 | .17 | .20  | .05 | 1    |    |
| 22 | .28  | .16  | -.05 | -.04 | -.05 | -.28 | .03  | -.05 | .01  | .01 | -.12 | .01 | -.30 | 1  |

N = 301. Coefficients greater than .11 in magnitude are significant at the 5% level.

value, or firm effects, as would happen if the firms had different expected levels of the dependent variable, or firm heteroskedastic standard errors, as would happen if different firms had different unexplained variability in the dependent variable. In preliminary analysis, we found that the data did not suggest firm differences or heteroskedasticity, but showed evidence of autocorrelation within firms. Autocorrelation can result from diversification or concentration plans that

Table 3. Regression Results for Change Magnitude

| Variables                           | Model I               | Model II              | Model III             | Model IV              |
|-------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Shipbuilding                        | 0.0151<br>[0.0156]    | 0.0188<br>[0.0157]    | 0.0121<br>[0.0175]    | 0.0164<br>[0.0178]    |
| Firm size <sup>Logged</sup>         | -0.0091<br>[0.0081]   | -0.0031<br>[0.0086]   | -0.0052<br>[0.0079]   | -0.0000<br>[0.0084]   |
| Firm age <sup>Logged</sup>          | 0.0269<br>[0.0218]    | 0.0262<br>[0.0231]    | 0.0106<br>[0.0238]    | 0.0093<br>[0.0245]    |
| Firm performance (t-1 to t)         | -0.0028**<br>[0.0010] | -0.0027**<br>[0.0010] | -0.0027**<br>[0.0010] | -0.0027**<br>[0.0010] |
| Entropy index                       | 0.0463**<br>[0.0145]  | 0.0468**<br>[0.0151]  | 0.0390**<br>[0.0142]  | 0.0390**<br>[0.0147]  |
| No. of executives                   | -0.0002<br>[0.0014]   | -0.0009<br>[0.0014]   | -0.0003<br>[0.0014]   | -0.0010<br>[0.0014]   |
| Average tenure                      | -0.0103**<br>[0.0027] | -0.0098**<br>[0.0027] | -0.0059+<br>[0.0034]  | -0.0064+<br>[0.0034]  |
| Proportion of<br>finance executives | -0.1899<br>[0.2570]   | -0.1871<br>[0.2569]   | -0.0885<br>[0.2554]   | -0.1270<br>[0.2570]   |
| Market growth (t-1 to t)            | -0.0397<br>[0.0339]   | -0.0465<br>[0.0343]   | -0.0566+<br>[0.0333]  | -0.0612+<br>[0.0337]  |
| Interest rates                      | 0.0078**<br>[0.0029]  | 0.0086**<br>[0.0030]  | 0.0076**<br>[0.0028]  | 0.0081**<br>[0.0029]  |
| Peer change of<br>diversification   | 0.0693<br>[0.0798]    | 0.0555<br>[0.0792]    | 0.0731<br>[0.0792]    | 0.0593<br>[0.0789]    |
| Outsider proportion                 | 0.0331<br>[0.0400]    | 0.0392<br>[0.0390]    | 0.0240<br>[0.0379]    | 0.0268<br>[0.0373]    |
| Proportion entries                  | -0.0909+<br>[0.0542]  | -0.0926+<br>[0.0539]  | -0.0602<br>[0.0563]   | -0.0646<br>[0.0558]   |
| Proportion exits                    | -0.0165<br>[0.0567]   | -0.0038<br>[0.0557]   | 0.0072<br>[0.0590]    | 0.0224<br>[0.0580]    |
| Newly hired CEO                     | -0.0071<br>[0.0088]   | 0.0105<br>[0.0115]    | -0.0051<br>[0.0086]   | 0.0101<br>[0.0113]    |
| CEO tenure                          |                       | 0.0045*<br>[0.0019]   |                       | 0.0035+<br>[0.0019]   |
| Appointed by CEO                    |                       | 0.0186<br>[0.0188]    |                       | 0.0227<br>[0.0186]    |
| Concentration of<br>formal power    |                       |                       | 0.0773<br>[0.0477]    | 0.0818+<br>[0.0489]   |
| Concentration of<br>informal power  |                       |                       | 0.4744*<br>[0.1954]   | 0.3945*<br>[0.1947]   |
| Rank match                          |                       |                       | 0.0202<br>[0.0261]    | 0.0203<br>[0.0260]    |
| Constant                            | 0.3462**<br>[0.1290]  | 0.2281+<br>[0.1353]   | 0.1304<br>[0.1481]    | 0.0724<br>[0.1485]    |
| $\chi^2$                            | 71.75**               | 73.49**               | 90.29**               | 91.78**               |
| $\chi^2$ for the power variables    |                       | 6.57*                 | 12.52**               | 17.41**               |

$N = 301$ , 19 firms.

+  $p < 10\%$ ; \*  $p < 5\%$ ; \*\*  $p < 1\%$ ; two-sided tests.

take more than one year to execute, so it is reasonable to find it in these data. Thus, we estimated feasible general least squares (FGLS) models with separate autocorrelation coefficients within each firm. This flexible model of autocorrelation allows firms to have different autocorrelation coefficients, as would happen if some firms were executing multi-year plans and others only had annual changes. The estimates were made by the XTGLS procedure of Stata (StataCorp 2001).

## Results

The model estimates are displayed in Table 3. The table shows one model for each set of theoretically related variables and a full model of all variables. Thus, model I is the baseline model with only the control variables, model II has the CEO power variables, model III has TMT power concentration variables and model IV has all variables. We compute two measures of model fit. First, the Wald test of model significance should be significant for each model and should increase when variables are added to the model. Second, the Wald test of significance of the power variables should be significant for each model and should increase when variables are added to the model. We emphasize this statistic in our description because it gives a direct test of how important each group of variables is for predicting change in corporate diversification. Except for some changes in significance levels, the findings are consistent across models. We thus focus our description on the full model of each table, but note differences in findings along the way.

CEO tenure has a positive and significant effect, in support of hypothesis 1a that more powerful CEOs make more extensive changes in diversification. The significance level is 10% in the full model and 5% in the model with only CEO power variables. However, the proportion of TMT members appointed during the CEO's tenure, which is an alternative operationalization of CEO power, has no discernable effect on the diversification. Hence one of the two operationalizations provides support for a CEO power effect.

Formal power concentration has a positive and marginally significant effect in support of hypothesis 2a that TMTs with more concentrated formal power make more extensive change in diversification. The coefficient of informal power concentration is positive and significant, supporting hypothesis 3a that TMTs with more concentrated informal power make more extensive change in diversification. Rank match did not have a significant effect, indicating lack of support for the hypothesis that power concentration is more effective when it is consistent across criteria. Tests of different effect strengths of the explanatory variables across industries showed no significant differences.

Table 4 shows the effects on momentum-breaking change, and is also interpreted with an emphasis on the final model IV. CEO tenure had a positive and significant effect, indicating support for hypothesis 1b that more powerful CEOs are more likely to reverse a diversification strategy. The proportion of executives appointed during the CEO's tenure had no measurable effect.

The coefficients of formal power concentration are not significant in the full model, demonstrating no effect of power derived from ranks in hierarchies on momentum-breaking change. Informal power concentration had a positive and significant effect, indicating support for hypothesis 3b that informal power from tenure differences leads to momentum-breaking change. Rank matching had an insignificant effect on momentum-breaking change. Tests of different effect strengths of the explanatory variables across industries suggested that the effect of informal power concentration was stronger ( $p < 0.10$ ) in the robotics industry, and the CEO tenure effect was stronger ( $p < 0.10$ ) in the shipbuilding industry. These differences suggest a larger role of the CEO relative to the TMT in determining strategic changes in the shipbuilding industry.

Table 4. Regression Results for Momentum-breaking Change

| Variables                           | Model I               | Model II              | Model III             | Model IV              |
|-------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Shipbuilding                        | 0.0337<br>[0.0282]    | 0.0368<br>[0.0269]    | 0.0535+<br>[0.0303]   | 0.0551+<br>[0.0288]   |
| Firm size <sup>Logged</sup>         | -0.0014<br>[0.0130]   | 0.0072<br>[0.0128]    | 0.0082<br>[0.0131]    | 0.0151<br>[0.0130]    |
| Firm age <sup>Logged</sup>          | 0.0478<br>[0.0380]    | 0.0528<br>[0.0390]    | -0.0148<br>[0.0453]   | -0.0048<br>[0.0416]   |
| Firm performance (t-1 to t)         | -0.0032**<br>[0.0011] | -0.0031**<br>[0.0011] | -0.0032**<br>[0.0011] | -0.0032**<br>[0.0011] |
| Entropy index                       | 0.0091<br>[0.0268]    | 0.0172<br>[0.0269]    | 0.0143<br>[0.0257]    | 0.0174<br>[0.0258]    |
| No. of executives                   | -0.0031<br>[0.0022]   | -0.0038+<br>[0.0022]  | -0.0028<br>[0.0022]   | -0.0036+<br>[0.0022]  |
| Average tenure                      | -0.0054<br>[0.0049]   | -0.0046<br>[0.0047]   | -0.0006<br>[0.0056]   | -0.0007<br>[0.0054]   |
| Proportion of<br>finance executives | -0.1909<br>[0.3707]   | -0.1873<br>[0.3687]   | -0.1034<br>[0.3658]   | -0.1042<br>[0.3645]   |
| Market growth (t-1 to t)            | -0.0668<br>[0.0493]   | -0.0710<br>[0.0487]   | -0.0781<br>[0.0488]   | -0.0808+<br>[0.0482]  |
| Interest rates                      | 0.0107*<br>[0.0046]   | 0.0113*<br>[0.0045]   | 0.0096*<br>[0.0045]   | 0.0102*<br>[0.0045]   |
| Peer change of<br>diversification   | 0.0832<br>[0.0971]    | 0.0708<br>[0.0964]    | 0.0831<br>[0.0981]    | 0.0699<br>[0.0966]    |
| Outsider proportion                 | 0.0401<br>[0.0622]    | 0.0541<br>[0.0598]    | 0.0297<br>[0.0601]    | 0.0403<br>[0.0582]    |
| Proportion entries                  | -0.1017<br>[0.0634]   | -0.1058+<br>[0.0635]  | -0.1111+<br>[0.0656]  | -0.1102+<br>[0.0650]  |
| Proportion exits                    | -0.0100<br>[0.0668]   | 0.0074<br>[0.0662]    | -0.0195<br>[0.0698]   | 0.0049<br>[0.0683]    |
| Newly hired CEO                     | -0.0086<br>[0.0110]   | 0.0144<br>[0.0142]    | -0.0104<br>[0.0111]   | 0.0131<br>[0.0142]    |
| CEO tenure                          |                       | 0.0067**<br>[0.0026]  |                       | 0.0065*<br>[0.0026]   |
| Appointed by CEO                    |                       | 0.0333<br>[0.0240]    |                       | 0.0302<br>[0.0239]    |
| Concentration of<br>formal power    |                       |                       | 0.0263<br>[0.0678]    | 0.0345<br>[0.0672]    |
| Concentration of<br>informal power  |                       |                       | 1.1285**<br>[0.3377]  | 1.0083**<br>[0.3211]  |
| Rank match                          |                       |                       | 0.0541<br>[0.0373]    | 0.0527<br>[0.0370]    |
| Constant                            | 0.1027<br>[0.2245]    | -0.1124<br>[0.2321]   | -0.0702<br>[0.2687]   | -0.2329<br>[0.2568]   |
| $\chi^2$                            | 49.39**               | 55.42**               | 69.48**               | 74.68**               |
| $\chi^2$ for the power variables    |                       | 8.09**                | 12.37**               | 21.00***              |

$N = 301$ , 19 firms.

+  $p < 10\%$ ; \*  $p < 5\%$ ; \*\*  $p < 1\%$ ; \*\*\*  $p < 0.1\%$ ; two-sided tests.

The findings were rather similar across the two outcomes, reinforcing the assumption that the effects of power concentration can be seen both in the rate of change and in whether the direction of change breaks a previously set pattern. The consistency gives confidence in the findings. Both CEO power and TMT power concentration affect diversification change, and the effects occur jointly. CEO power could only be shown through tenure, however, as the proportion of executives appointed by the CEO did not display any effect. Power

concentration in the TMTs was seen through formal ranks and informal tenure distributions, but the tenure distribution effect appeared to be more robust.

## Conclusion

This paper has examined how CEO power and TMT power concentration can change corporate strategies. We argued that concentrated power in the CEO or the TMT facilitates and rewards power use, and we found supporting evidence in our investigation of diversification changes by Japanese shipbuilding and robotics firms. First, CEO power as a result of social capital, measured with tenure, causes greater likelihood of change in firms' strategies. It also caused strategic change that broke the momentum of past changes. Second, an effect of formal power concentration in TMTs was seen through the finding that rank inequality led to change in the diversification level. Third, an effect of informal power concentration in TMTs was seen through the finding that tenure inequality increased diversification change and change that broke the momentum of past change. Taken together, the findings show that concentrated power results in strategic change.

Previous research suggests that power has an influential role in various parts of organizational life (Mannix 1993). Examples include selection and succession of organizational leaders (Boeker 1992; Ocasio 1994), development of interlocking ties (Zajac and Westphal 1996), shareholders' influence on diversification postures (Westphal 1998), and design of reward structures (Pollock et al. 2002). The findings extend our understanding of effects of intraorganizational power concentration on strategic change in several ways. Finkelstein (1992) found effects of power held by executives with finance background on the level of diversification, whereas this study proposes effects of more general patterns of power concentration in TMTs on rates of strategic change. Our finding also extends that of Mitsuhashi and Greve (2004) because we find not only an effect of power concentration derived from informal bases but also of CEO power and formal power concentration that were unexplored in our earlier analysis.

Our findings are not fully consistent with findings in previous research. Lant et al. (1992) and Gordon et al. (2000) found that CEO replacement is a crucial organizational event that triggers strategic change because new CEOs (or CEOs with shorter tenures) bring new mindsets and perspectives to strategic decision-making processes. This theoretical conflict can be resolved by exploring moderating factors that account for whether power is used for change or inertia. Indeed, Bigley and Wiersema (2002) find that a new CEO with shorter duration of interactions with the preceding CEO tends to develop a different mindset and perspective and thereby use power to initiate strategic orientation just after the appointment, suggesting a moderating role of the CEO's prior experience in determining the impact of his or her power on strategic change.

Also, Miller (1991) found that the firm has greater distance to the optimal strategy and structures as the CEO's tenure grows. This finding is different from ours in that the source of the greater distance can be either inertia or large changes that are not appropriate to the strategic situation. We did not explore

whether the changes increased the strategic fit because we found it difficult to specify plausible models of strategic fit for these firms. A combined approach of examining both the extent of change and its effectiveness would allow better understanding of whether the lower fit seen in firms headed by long-tenured CEOs contradicts our findings or can be explained by our findings.

The findings are based on a focused study of two industries — shipbuilding and robotics firms in Japan. This was done to ensure that the firms were similar in their main activity while picking industries where the firms were sufficiently resource-rich and diversified to give the decision makers real ability to change the diversification posture of the firm. A two-industry study with a limited number of firms also allowed a deeper data collection with 22 years of observations for each firm. This is an important feature of the study design because decisions to diversify or concentrate are ones that the firm cannot implement quickly, or even within a year. Thus, a panel data structure and controls for autocorrelation are needed to separate the changes that result from decisions taken in a given year from the changes resulting from decisions in previous years.

The cost of a two-industry design is that the generalizability is uncertain. Maybe these firms are special in some ways that influence how power relations affect change, so the findings need to be replicated in other contexts. We would encourage such replication, while cautioning that panel data are so important to avoid bias when analysing diversification changes that future work should maintain this feature of the study design. Focused study of a few industries may not be a necessary feature of the study design. Sampling from a greater number of industries or broadly across industries may well suffice.

This work could be extended by looking for other sources of power concentration. We examined organizational rank, which endows legitimated power, but one can also gain power by successfully managing environmental contingencies (Hickson et al. 1971; Pfeffer and Salancik 1978; Finkelstein 1992). Given that formal hierarchical ranks are just one indicator of intraorganizational power, it would be informative to consider whether other sources of concentrated power affect strategic responses to environmental changes.

There are also additional directions for future research. First, this study examines how power concentration influences corporate diversification, and highlights that greater inequality in TMTs yields large-scale strategic changes. It is hard to conclude from such data whether this decision making is effective or not, as a high rate of change may be a liability. Earlier work has suggested that the changes made by long-tenured CEOs tend to reduce fit to the environment rather than increase it (Miller 1991). Halebian and Finkelstein (1993) also found that firms with dominant CEOs who tend to restrict and manipulate information flows in organizations perform worse in a turbulent environment than in a stable one. Regardless of this potential causal mechanism in which power structures, strategic change and organizational performance are related to each other, too many confounding factors make it difficult to discover from field studies whether specific organizational changes improve performance or not (March and Sutton 1997). Research where it is easier to assess the effectiveness of decisions would help answer such questions, and experimental studies are especially useful (Bandura and Jourden 1991; Pelled et al. 1999; Audia et al. 2000).

Moreover, our analysis did not find a significant effect of the number of appointments by the CEO, which is consistent with Ocasio (1994) but not with Boeker (1992). A possible reason is that appointment decisions generate obligations based on norms of reciprocity and thus social support to appointers (i.e. CEOs) only under specific conditions. For instance, appointment decisions may not be instrumental for generating power if appointees are highly confident about their workplace knowledge and capabilities and consider appointments to be sheer outcomes of their merits. Also, secretive appointment processes may obscure to whom appointees owe their appointment. Future research should explore conditions that need to be met for appointment decisions to serve as a source of power.

The theory proposed here argues that researchers should distinguish CEO and TMT sources of power, and the findings suggest that this distinction will be empirically productive. Future research could pursue these variables in other contexts and with other strategic behaviours as outcomes, or it could go on to test which other power bases influence strategic change. The opportunities for future research based on power theory are broad. There is already significant research on power, and the ideas proposed here should further strengthen this research stream.

## Notes

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- 1 CEO duality, in which a CEO also chairs the board of directors, would increase the formal power of the CEO, but is not found in our data.

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