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Top Management Team Heterogeneity: Personality, Power, and Proxies

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The authors have crafted a paper that is exciting on several levels. It is an enticing story of how a top management team changes over time and how those changes dramatically alter firm performance. It is also a thought-provoking juxtaposition of the qualitative understanding of that team with its demographics. Finally, it is an illuminating exploration of the findings of several well-known demographic studies of top management teams in light of the deep understanding from the case study data. Overall, this research makes valuable contributions to research on group heterogeneity and the demographics of top management teams. Most significantly, it highlights the value of triangulated, multimethod research—i.e., the insightful interplay between case study and large sample research.

Kathleen Eisenhardt

Abstract

This article reports partial results of an eight-year field study of the Top Management Teams (TMTs) of a global multidivisional financial services corporation and compares those results with large-sample work in the TMT literature. In particular, it investigates the operationalization of TMT cognitive diversity by the proxies of age, team tenure, industry experience, and functional background heterogeneity most often used in statistical work, and compares those operationalizations with cognitive diversity itself. In addition to highlighting which proxies seemed to most closely approximate cognitive diversity and why, it demonstrates the confounding impact of power on all operationalizations. A comparison of the field results with three representative studies with respect to the operationalization of the dependent variables of diversification, innovation, and performance helps to explain why previous TMT heterogeneity research has often produced inconsistent results or nonfindings. It offers some suggestions that should improve the robustness of statistical research and demonstrates the reciprocal usefulness of case and large-sample research.

(Top Management Team; Personality; Power)

Introduction

Hambrick and Mason's 1984 watershed article, "Upper Echelons: The Organization as a Reflection of its Top Managers," has spawned an important and prolific stream

of research on top management teams. In their recent review of the literature, Finkelstein and Hambrick (1996) examined no fewer than forty empirical studies which had as their focus the top management team (TMT), its composition, and its impact on strategic actions or organizational outcomes. Seldom has conceptual work had such a profound impact on the research orientations of a profession. In a sense, this should not be surprising. There are few more important subjects to strategy scholars, or for that matter to practitioners, than the link between the people at the strategic apex of the organization and that organization's performance.

To test their theory of the impact of top managers on strategic outcomes, Hambrick and Mason had urged scholars to rely on objective, observable, and verifiable characteristics of top managers—their demographics. They argued that if such "noisy" but easily accessible indicators produced significant results, "then the upper echelons theory will have been put to a relatively stringent test" and clinical work could follow (Hambrick and Mason 1984, p. 196). There is now no question that the theory has been put to, and has withstood, this test.

In fact, many studies have demonstrated significant relationships between certain demographic features of top managers and important strategic phenomena. For example, length of top management team tenure has been

linked to the quality of strategic information search (Tushman and Romanelli 1985, Miller 1991), strategic persistence (Finkelstein and Hambrick 1990), and strategic change (Wiersema and Bantel 1992). Once highly contentious, it is now much clearer that strategic choice exists (Child 1972), and that organizations, while obviously subject to strong environmental influences, are in some important sense a reflection of their top managers. As one scholar notes, in itself this is a major contribution, "That any statistically significant linkages at all were found between specific aspects of... [a few] members of the organizations studied and those organizations' performance is remarkable and constitutes strong support for those who advocate further study of the top management group." (Murray 1989, p. 137) This contribution could not have been made without the use of the demographic proxies that facilitate large samples.

One area, however, has proven particularly intractable: the relationship between the cognitive diversity of teams as represented by the heterogeneity of their membership, and some strategic outcome. On the one hand, there are strong theoretical reasons to believe that heterogeneous top management teams will be more successful because they permit a more comprehensive search and analysis of strategic alternatives and exhibit greater creativity due to the exchange of diverse ideas originating in different cognitive perspectives (Eisenhardt and Schoonhoven 1990, Wiersema and Bantel 1992). On the other hand, such cognitive diversity may make teams less successful because heterogeneity along certain lines may produce conflict and therefore reduce strategic consensus (O'Reilly et al. 1989, Smith et al., 1994). Neither position receives robust or convincing empirical support. In their careful examination of the studies that used the demographic heterogeneity/homogeneity distinction, Finkelstein and Hambrick (1996, pp. 149–153) discovered that of the 116 relationships tested, 75 produced nonsignificant results, and the significant results either explained little variance or were in conflict. For example, they remind us that of two studies linking some measure of demographic heterogeneity to innovation (Bantel and Jackson 1989, O'Reilly and Flatt 1989), the first discovered one significant relationship between functional heterogeneity and a proxy for innovation, while the second discovered three significant relationships in the opposite direction. Finkelstein and Hambrick (1996) find these results "troubling" and offer some theoretical reasons which may explain them. On the other hand, West and Schwenk (1996, p. 575) attribute their own "resounding nonfindings" to methodological problems and suggest that current methods be "cast aside." While we agree with these authors

that some of the problems may be methodological in origin, we think there may be less radical solutions available than casting out large-sample methods.

Inconsistent, nonsignificant, or weak results may arise for a number of reasons both theoretical and methodological:

1) The hypothesized relationships are in fact nonsignificant; our theories are wrong, and the composition of the TMT is not important.

2) Unmeasured moderator variables such as industry may attenuate or even overwhelm the more direct relationships; our theories are right but we have left out a key factor, and this fatally weakened the explanation of variance. For example, maybe the composition of the team is only important in turbulent environments, and we measured only stable ones.

3) Unmeasured intervening variables obscure or attenuate the direct relationships hypothesized. Perhaps it is not composition per se that matters but rather the structure of power in the team and the process through which its members interact. What matters is consensus or conflict, which may or may not be independent of composition.

4) Independent and/or dependent variables have been inadequately operationalized; our theories are right, but our measurement has been weak. Heterogeneity is important but our proxy failed to capture it; there is an effect on performance but our performance measure failed to capture it; our operationalization of heterogeneity resulted in a false positive/negative with respect to some outcome variable and was therefore inconsistent with the results from a previous study.

5) A slight misspecification of both independent and dependent variables may attenuate otherwise significant results. Our operationalization of composition was tenuous and our operationalization of performance was tenuous, and the interaction of two tenuous operationalizations cancelled out the statistical significance, leading to nonfindings.

To date, scholars have tackled these measurement issues by varying team definitions, sectors, samples, and independent and dependent variable operationalizations simultaneously and seldom with a "replication with extensions" methodology (Hubbard et al. 1998), which would make comparability easier. For example, prior research has used many different proxies for heterogeneity: team tenure (Boeker 1997, Keck 1997, Keck and Tushman 1993, Michel and Hambrick 1992, Wiersema and Bantel 1993), functional background (Bantel and Jackson 1989, Halebian and Finkelstein 1993, Keck 1997, Knight et al. 1999, Krishnan, et al. 1997, Smith et al. 1994, Sutcliffe 1994), industry experience (Eisenhardt and Schoonhoven 1990, Smith et al. 1994), age

(Chattopadhyay et al. 1999, Knight et al. 1999, Zenger and Lawrence 1989), and education (Bantel and Jackson 1989, Knight et al. 1999, Smith et al. 1994, Wiersema and Bantel 1992). The top management team has been defined variously by title using archival records (Finkelstein and Hambrick 1990, Halebian and Finkelstein 1993, Murray 1989, Sambharya 1996), or by CEO survey (Athanasios and Nigh 1999, Bantel and Jackson 1989, Chattopadhyay et al. 1999, Iaquinto and Frederickson 1997, Priem 1994), or CEO interviews (Eisenhardt and Bourgeois 1988, Eisenhardt and Schoonhoven 1990, Knight et al. 1999, Smith et al. 1994).

This somewhat eclectic approach has born some fruit; for example, statistical relationships between heterogeneity and strategic outcome variables appear to be stronger in turbulent than in stable environments (Boeker 1997, Eisenhardt and Schoonhoven 1990, Murray 1989), but many mysteries remain. Perhaps the process of refining our operationalizations would be speeded up by combining the insights of large-sample and case research. Fieldwork can be particularly useful when “current perspectives have little empirical substantiation or they conflict with one another” (Eisenhardt 1989, p. 548), and many TMT scholars have called for it (Bantel and Jackson 1989, Wiersema and Bantel 1992). If such fieldwork could help to narrow the range of adequate operationalizations it may open the door to the more rigorous, large-sample replications which will build solid knowledge. Hambrick and Mason (1984, p. 203) had already anticipated many of the difficulties that would be encountered, and that research would be needed as to which demographic indicators work best in given industries and contexts. They argue that, “access to a single firm with dozens of business units and detailed personnel records on key managers could make for a promising study.” The purpose of this article is to explore this possibility by relying on their suggested exploration of a “single firm with dozens of business units.” In so doing, we hope to untangle some hitherto confusing results and to demonstrate the power of combining case and large-sample research.

The case material we present cannot possibly do justice to the vast range of subjects of interest to scholars of top management teams; Finkelstein and Hambrick (1996) offer no fewer than fifty-two research propositions in their recent review. Instead, we present the information in such a way as to highlight key relationships between the teams and three strategic outcomes of strong scholarly interest: between team heterogeneity and diversification, innovation, and performance. We have chosen to concentrate on these three areas because diversification posture (where to compete) is widely accepted as a key strategic choice;

innovation (how to compete) is viewed as a key intermediate link to performance, and performance itself is of obvious direct import.

Of course case material by its very nature cannot “prove” anything; it is exploratory and suggestive, and readers must judge from its presentation both its face validity and the extent to which it may be representative. However, in-depth knowledge of the three teams in the multidivisional, international organization that we present here allows us to compare traditional proxies for cognitive diversity with cognitive diversity itself. It allows us to demonstrate the critical importance of measuring relative power in the team. It gives us insight into why some well-known studies may have shown nonfindings, false positives, or negatives, leading to some of the inconsistency in empirical results in existing top management team research. It permits us to see that most of the theoretical relationships that scholarly work has hypothesized between team features and outcome variables are borne out, and that the main reason for limited empirical success to date may not be theoretical, but rather methodological in origin.

After presenting the methodologies used to gather the material, we then present the three teams. After a discussion in which we compare the case results with the demographic proxies for the independent variable, team heterogeneity, then we compare and contrast the results with respect to the dependent variables used in three previous studies, each one representative of work in the three domains of diversification, innovation, and performance. A final section offers some suggestions to improve measurement in each area.

Methods

The information presented here is part of a larger study of strategic leadership (Pitcher 1997) based on eight years of close observation at the board and management committee levels inside one \$20 billion global, multidivisional financial services corporation.¹ The top management team of the worldwide corporation consisted of the Chairman and CEO of the Group and key divisional CEOs. The divisions were autonomous subsidiaries reporting financial results separately. In some cases, the division had publicly traded shares; in all cases, the divisions were governed by a CEO who reported to an independent board of directors.

In addition to observational and archival data and informal meetings, two rounds (1986 and 1990) of fifty formal semistructured interviews took place with group and divisional board members, group and divisional CEOs, as well as their immediate vice-presidential subordinates. The interviews explored observers' views with

respect to team functioning, strategy, structure, innovation, performance, and their potential relation to the personalities of the CEOs. The personality of each of the fifteen Group or divisional CEOs was measured by a modified adjective check list (Gough 1960) which is reproduced in Appendix A. The check lists were administered during the interviews with ten knowledgeable observers per subject. Interrater reliability was 0.71.² Three techniques were used to analyze the data: Q-type factor analysis (Overall and Klett 1972, Miller and Friesen 1980), correspondence analysis (Lebart et al. 1984), and Pearson correlation. Although not part of the original study design, most top management team demographic information was available.

Three Eras of Top Management Teams

To make the descriptions in the following case presentation intelligible, we first present the analytical results of the personality test. The factor analysis of the adjective data base produced three factors with strong Eigenvalues (5.2, 3.6, 2.5), explaining 75% of the variance in the lists. To better understand which adjectives contributed to the formation of the factors, this factor analysis was followed by correspondence analysis, which reveals the mathematical contribution of each adjective. This analytic technique also produced three factors representing 76% of the variance. The adjectives associated with Factor 1 are daring, emotional, imaginative, visionary, entrepreneurial, intuitive, funny, and inspiring, and this factor was subsequently labeled the “artist” ideal type. Factor 2 is characterized by responsible, stable, predictable, sensible, well-balanced, trustworthy, realistic, and reasonable, and was subsequently labeled the “craftsman” ideal type. Factor 3, associated with uncompromising, hard-headed, intense, determined, no-nonsense, cerebral, fastidious, and detail oriented, was labeled the “technocrat” ideal type. Specific Pearson correlations between individual profiles are embedded in the case description below.

We now turn to a description of the three teams.

Team 1—1983–1985. During this period, the top management team consisted of nine men: The Group Chairman and CEO, the President, and the seven CEOs of major divisions. A diverse group of men, they ranged from 41 to 64 years of age and had from 1 to 43 years of industry experience. They came from widely different educational backgrounds, with formal education ranging from 11 to 19 years. They had taken very different career paths as well. Some came up through the investment function, while some had spent their whole careers in general management. One rose through the legal function, and two others had been industry consultants.

A heterogeneous group in demographic terms, it was

equally diverse in terms of personality. The Group Chairman and two divisional CEOs were described by colleagues as Artists: intuitive, imaginative, entrepreneurial, visionary, open-minded, unpredictable, and funny, and the Group Chairman’s profile correlated with that of two division heads at 0.60 and 0.73 ($p < .01$), respectively. The Group President and one divisional CEO were described as Technocrats: analytical, cerebral, methodical, uncompromising, stiff, and distant, and their profiles correlated at 0.77 ($p < .01$). The other four divisional CEOs were temperamentally very similar men (their adjective profiles correlate on average at 0.88 ($p < .01$), Craftsman, and were most often characterized as reasonable, sensible, stable, responsible, knowledgeable, trustworthy, and predictable.

Since the mid-1960s under the direction of the current Chairman, the corporate strategy was growth and diversification by acquisition. By the early 1980s, it had succeeded in diversifying both geographically and sectorally from one regional life insurance market to global operations in all financial market segments. This ethic of growth and expansion formed the backdrop of team expectations and dominated Team 1’s outlook. The Chairman described the ethic this way,

... we don’t believe an institution like ours should be judged strictly on the basis of the judicious and efficient use of resources ... An enterprise must always be judged by its investment in the future and by the ingenuity with which it acts like a pioneer.

Financial and managerial success had spawned an infectious optimism, and everyone on the team seemed to share the expansionist drive.

Management committee meetings were punctuated by jokes and smiles, and the climate was generally one of good humor. There were no visible interpersonal tensions or major policy disagreements. There seemed to be a remarkable absence of politics in the form of coalitions around divergent opinions, which appeared to cast into doubt the notion that strategy emerged from a bargaining process. When asked directly about such a theory of strategy formation, the President replied: “Not at all. There’s nothing to fight about. We all agree on what needs to get done.” Another team member, CEO of the general insurance division, explained that there was no reason for conflict because they didn’t get in one another’s way, and they all knew what they were doing: “We’re all entrepreneurs, and we run our sectors.”

This comment reflected another part of the ethic that drove the organization and the team: decentralization. The acquisitions had all been smoothly integrated and local management, for the most part, retained. The Group

Chairman and CEO, as well as the Group President, sat as ordinary members on subsidiary boards to maintain liaison with the divisions, and divisional CEOs reported their initiatives in monthly management committee meetings. The organization was structured hierarchically on paper, but the strategic decision-making process was highly decentralized. Officially, divisional CEOs reported through the President to the Chairman. In practice, team members shared information with each other: financial results and forecasts, acquisition prospects, product innovations, capital requirements, financing arrangements, share issues. Both divisions and the head office scouted opportunities for acquisitions, and top management team meetings were not so much for guidance as they were for coordination and formal ratification of decisions.

A major acquisition in 1985 was financed by a share exchange that placed the private market value of the corporation's shares at 140% of book value. Things were going so well that the Group Chairman felt few qualms about turning over executive control to the then President. Chief architect and brain behind the colossal success, the Chairman felt that after close to twenty years a man can run out of new ideas and that "sometimes an organization needs fresh air." He didn't wish to cling to power, and he was confident that the entrepreneurial spirit of the company could not be changed because it was, in his words, "too engrained" in the corporation to be vulnerable.

Team 2—1986–1988. With the President's ascension into the Group Chairman and CEO post, the team atmosphere began to change and consensus was to evaporate. The new Chairman, a Technocrat and universally described as "stiff" and "distant", had felt for a long time that the organization was unwieldy and its diversification posture too broad. Now in charge, he said it was time to bring "order to the chaos . . . to rationalize and streamline his [the former Chairman] acquisitions. He didn't really have a plan you know. There are all kinds of things that need to be sold off." While the momentum of the earlier period and an important acquisition would carry over into the new period, divestiture activity accelerated and the net growth of assets slowed appreciably.

Bringing "order to the chaos" for the new Chairman meant that new systems and structures were needed. He instituted a formal strategic planning process steered by a newly-hired V.P. of planning at the head office. This provoked the first rumblings of serious discontent. Divisions were told to submit their own five-year plans, but some key divisional CEOs balked at the order and dragged their feet. One of them complained, "That stuff's just an excuse not to work. It all goes into the shredder

anyway." In addition to strategic planning, new head office V.P. positions were created in marketing and in information systems as the Chairman was convinced that intragroup, cross-segment marketing synergies should be orchestrated at the top. The divisional CEOs of both banking and life insurance strenuously resisted the centralization of investments in information systems. They lost the battle. Feeling overloaded with work and wishing to provide for an eventual smooth transition in the event of succession, the Group Chairman created the position of Chief Operating Officer and nominated a divisional CEO to the slot, someone whom insiders called "the clone." Their technocratic personality profiles correlated at 0.77 ($p < .01$), and both were seen as stubborn, rigid men.

Thus, by 1988 many things with respect to the top management team had changed, although on paper they remained the same. Divisional CEOs were technically still at the heart of the management structure and, in addition to reporting to their own independent boards, still reported through the position of a Group executive (now called COO since the abolition of the president title) to the Chairman who in turn reported to an independent Group board of directors. The TMT was now composed of eight out of the nine members who were on the team during the previous five years; the only change was that the former Chairman had left. Thus, on paper, it was still very heterogeneous. As Table 1 shows, in the absence of the former Chairman, age and team tenure heterogeneity drop, while functional, industry, and personality heterogeneity are largely unchanged. However, power has shifted dramatically, and the previous dominant ethic of growth and expansion has shifted with it.

The new Group Chairman and his COO shared a view of managing that divisional CEOs did not. Their differing conceptions of strategic means/ends relationships were consistent with their respective personalities. For example, the Artist divisional CEOs, "imaginative" and "intuitive", believed that share prices were a reflection of stock analysts' belief in the exciting future of the group; one stated, "If you don't have dreams, the shares won't move." Craftsmen divisional CEOs in the team, "realistic" and "sensible", believed that share prices reflected analysts' judgements about the expertise and experience of management in the industry. Technocrats (the Chairman and COO), "methodical" and "detail-oriented", insisted that Wall Street wants only regular, strong quarterly earnings. The two Artist divisional CEOs, universally described as "visionary", felt that strategy was made of "dreams, quirks, love affairs, lucky guesses." The four Craftsmen CEOs valued industry experience and product knowledge and felt that strategy evolves with the

Table 1 Summary of Case Results

| Era | 1983–1985 | 1986–1988 | 1989–1991 |
|---|--|--|---|
| Descriptive Team Statistics | | | |
| TMT size | 9 | 8 | 7 |
| Average Age | 50 | 48 | 45 |
| Average Industry Experience | 19 | 14 | 10 |
| Average Team Tenure | 6 | 9 | 4 |
| Proxies for Cognitive Diversity and Personality | | | |
| Age Heterogeneity(a) | 0.13 | 0.09 | 0.12 |
| Industry Experience Heterogeneity (a) | 0.87 | 0.89 | 0.44 |
| Team Tenure Heterogeneity (a) | 0.97 | 0.26 | 0.60 |
| Functional Heterogeneity (b) | 0.51 | 0.54 | 0.74 |
| Personality Heterogeneity (c) | 0.67 | 0.63 | 0.38 |
| Proxies and Personality Adjusted for Power | | | |
| Age Heterogeneity | 0.13 | 0.26 | 0.32 |
| Industry Experience Heterogeneity | 0.87 | 0.50 | 0.25 |
| Team Tenure Heterogeneity | 0.97 | 0.37 | 1.0 |
| Functional Heterogeneity | 0.51 | 0.15 | 0.62 |
| Personality Heterogeneity | 0.67 | 0.55 | 0 |
| TMT and Corporate Features | | | |
| Cognitive Diversity | High | Declining | Low |
| Strategic Decision-Making Process | Informal and decentralized | Formalizing and centralizing | Complete formalization and centralization |
| Strategy | "Prospector" | "Analyzer" | "Defender" |
| Diversification | High | Moderate | Low |
| Innovation | Strategic positioning and high product innovation | Product innovation moderate and declining | Low innovation |
| TMT Objectives | Growth | Profitability | 15% ROI |
| Performance | Strong asset growth Market/Book value 90 → 140% | Assets plateau Market/Book value 90 → 75% | No net change Market/Book value 75 → 50% |

Notes.

(a) This heterogeneity measure was computed using the coefficient of variation. If a team is perfectly homogeneous, this coefficient would be 0.

(b) Functional categories of "output", "throughput", and "peripheral". This heterogeneity measure is computed using Blau's index given by $1 - \sum p_i^2$, where p is the proportion of individuals in the category. If the index is close to 1, then the team has high heterogeneity; if close to 0, low heterogeneity.

(c) Personality heterogeneity is based on the factor-analytic results and Blau's index.

knowledge and skill of the whole team and that "If you look after the people the profit follows." The technocratic new Chairman and COO, on the other hand, believed that strategy was something clear, final, concrete, and subject to norms of control like ROI targets. These technocratic personalities did not believe that senior managers needed to know the industry or its products; they needed, in their words, "gray matter." To a Technocrat, organization slack was "just a sign of the inefficiency of the system," whereas for Artists slack represented the nest egg with which to invest in the future, and Craftsmen saw it as a resource that "you use to develop your people." These

different attitudes and beliefs, stemming from profound personality differences, colored all aspects of TMT attitudes toward key corporate issues.

In the previous era, power in this highly heterogeneous team was distributed. Decentralization and tolerance of diverse attitudes and beliefs was sanctioned and reinforced by an original Chairman who was held in high esteem. He was powerful but "open-minded" and was therefore by temperament inclined to share that power with his team. The new Chairman, universally recognized as both stubborn and close-minded, had no such inclination, nor were he or his new COO tolerant of opposing

points of view. Head office personnel, particularly the new technocratic VP-Finance, took on more importance and began to have more influence than divisional CEOs. One of the latter would comment, "He [the CEO] only listens to [the COO] and [the COO] only listens to [VP—Finance]."

The tensions and conflicts surrounding policy disputes, such as efforts by the Head Office to take control of divisional marketing and systems development, were increasingly exacerbated by efforts to reduce costs and drive short-term profits to the bottom line. One CEO complained,

These Cost-Cutters don't know what they're doing. All the while they've got their heads down looking at the figures, the world changes and the projections disappear. That's why you always have to shoot higher than where you expect to land and invest in new markets and new products.

These conflicts and tensions were "managed" by divisional CEOs avoiding Head Office whenever possible, and each explained how: "I try to stay in New York."; "I try to keep my head down and just look after business."; "I try to keep my mouth shut."; "I hide development money in my budget, and I'm the only one who knows where it is." Conversely, Head Office "managed" the tension by having fewer and fewer top team meetings. They were replaced by one-on-one meetings between the CEO, COO, and divisional heads who were now required to produce and justify strategic plans, annual budgets, and mission statements. Strategically, divestitures continued apace but now, in part, to boost quarterly earnings to compensate for sagging operational profits. In addition, administrative reorganizations were frequent. For example, one direct-marketing division was sold internally to two different divisions during a two-year time frame to create paper profits. When asked what was the strategy of the Group, one divisional CEO replied: "*It's very murky. They seem only to be fascinated by tinkering with the thing—structures, systems.*" According to the Chairman's 1988 message to shareholders in that year's annual report, it wasn't "murky" at all; he announced clearly that "*profitability is our strategy.*"

Team 3—1989–1991. Over the next three years, internal policy conflicts continue and profits wilt. The diversification posture is radically reduced to essentially life insurance and banking, with both trust and general insurance gone, lines of business such as group life and health insurance eliminated, and buyers sought for international divisions. By 1990, the Chairman has, for personal and not professional reasons, voluntarily retired from the chair, but he remains on the Group board. His COO has been elevated to Chairman and CEO. Because

of continuing policy conflicts and unsatisfactory profits, the new CEO replaces all but two of the 1988 divisional CEOs. He argued, "*Today you need 'pros'. You can't afford dreamers but they make good consultants.*" They are systematically replaced by men whose personality profiles load on the same Technocrat factor as the new Group Chairman and CEO.

Although both the average age and average industry experience of the team declined between the second and third teams, once again on paper the team remains relatively heterogeneous. Functional heterogeneity appears to rise as does team tenure heterogeneity, although both industry experience and personality heterogeneity fall. If the two powerless Craftsmen divisional CEOs are dropped from the calculation, personality heterogeneity falls to zero.

Perhaps more importantly, however, what appears to be a team is not. Although certain head office staff, notably a new VP-Planning and VP-Administration have some influence, only two people have real power over the strategic destiny of the group: the CEO and the former VP-Finance now promoted to replace the CEO of the largest division. Central control over the divisions is complete and assured by two dominant mechanisms: budget approval and hiring. The Group CEO hired new divisional CEOs who shared his technocratic personality and believed in the same things.

In 1990, the former VP-Finance and now divisional CEO comments on the strategic orientation of the group, past and present:

In [the first Chairman's] day, it was a cult of personality. Things happened without him realizing it. In the sense that it was all opportunistic. There was no strategy. Why were they in Canada? The U.S.? It all lacked logic. Then they brought in the pros [Team 2 CEO and COO] to put some order into it all. They built the group around a concept that does not work—synergy. One-stop shopping, like a drug store. But, there has been no revolution just evolution. Everybody is just getting better at what they do in individual sectors.

For this Technocrat, getting better meant getting more profitable. One divisional CEO, one of the Craftsmen who had survived the first main round of firings but would later be fired, lamented the style of this former VP now in charge of his subsidiary, "*Oh yeah, the great managers. He called me the other day and started the conversation with, 'How many people have you fired today?' It's disgusting. I hung up on the [swear word].*"

Although Team 3 strove directly for profitability, explicitly 15% ROI for all divisions, for the most part it did not succeed. The stock price went down by 40% between 1986 and 1990 as market value fell from 91% to 49% of book value. Certainly, this was a difficult period for all

financial services companies as, among other things, the 1987 stock market crash negatively affected earnings, and depressed real estate prices negatively affected earnings expectations if not actual results. However, Team 3 with its increasing homogeneity performed worse than its key competitors. Figure 1 contrasts the performance of the company against its three most comparable competitors. Although it is obvious from Figure 1 that all four companies suffered during the period, ABC Company's closest rival was trading at 81% of its book value, while the industry leader had a 110% market-to-book value. The verdict of the market was in any case quite clear. With its stock trading at less than half its book value, it was not surprising that three years after the study formally closed, the company disappeared, an easy victim of a takeover. Table 1 summarizes the data for the three top management team eras.

Personality, Power, and Heterogeneity Proxies in the Three Teams

During the first era, we see a deliberate strategy of growth and diversification within a highly decentralized, divisional structure that favored product innovation and capital investment in the divisions and was accompanied by high performance in terms of asset growth. During this era, a self-reinforcing cycle of high performance, access to equity funding used to acquire positions in new markets and products, as well as funding R&D, was operating.

During the second strategic era, from 1986–1988, the growth strategy began to give way to a strategy of rationalization, which led to a reduction in the level of diversification. This was accompanied by reductions in subsidiary autonomy and resources as headquarters began to control and centralize key strategic decisions. With declining market-to-book value, capital markets were less and less receptive to the company and its emphasis shifted ever more strongly to the generation of internal profits to fuel investment in systems development and to pay for increasingly expensive head-office functions and staff. Because emphasis was increasingly placed on short-term profitability, previously autonomous subsidiary activity that included decisions about capital investment and product innovation began to give way to centrally inspired rationalizing activity and cost cutting.

By the final era, this emphasis on short-term profitability was reinforced, but strong profitability did not materialize. In the absence of strong internal cash flow, with capital markets continuing to shun the corporation and the divestiture wave leaving no more stand-alone assets to sell off, the search for alliances with powerful international partners accelerated. This strategy was explicitly

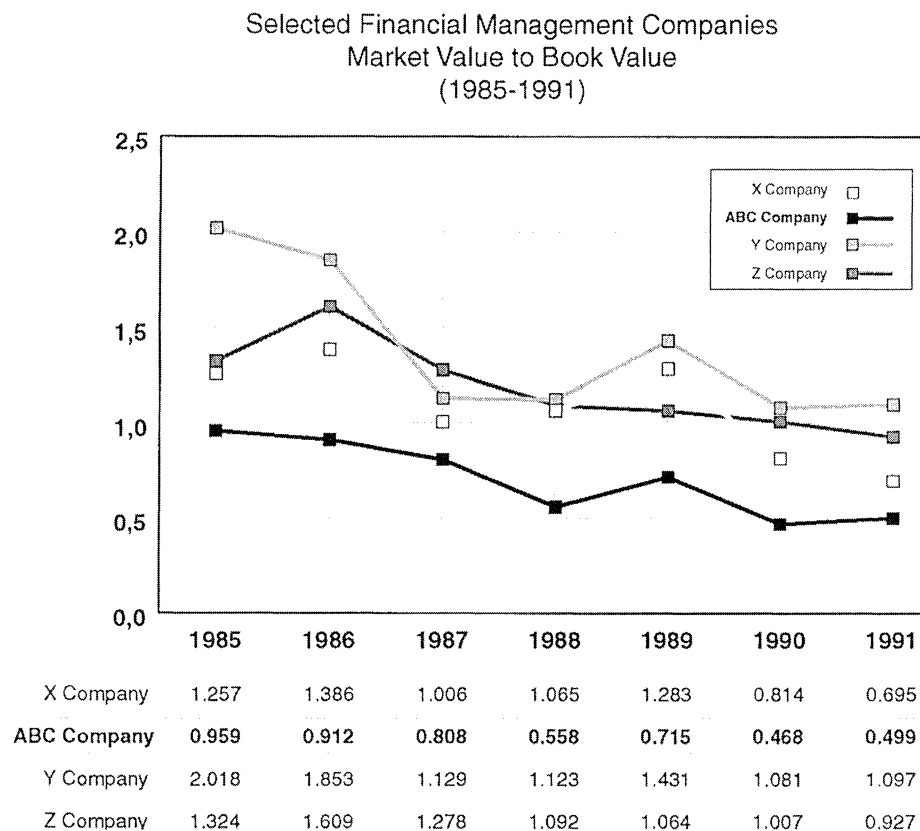
designed to raise capital not otherwise available from markets or from earnings; the goal was to find a partner who would take up to 49% of the controlling stock of the whole group and thus provide an important infusion of capital for unspecified future development. By 1993, every negotiating effort to forge such an alliance had been unsuccessful. The Board of Directors finally decided that it no longer had any option but to sell out completely.

What role did the heterogeneity or homogeneity of the top management team play in these developments? If we look at Table 1, we see that the heterogeneity of the nine-member Team 1 is well represented by team tenure and industry experience, less well by both functional experience and personality. Age, on the other hand, is not a close proxy but there is little doubt that this is a highly heterogeneous team. As predicted by the literature, Team 1's heterogeneity correlated with a period of strategic creativity, specifically TMT efforts to enter new markets and develop new products, and team heterogeneity seemed to be a winning combination in a turbulent, deregulating marketplace, conforming once again to the literature (Boeker 1997, Eisenhardt and Schoonhoven 1990, Murray 1989)

By the time we reach the eight-man Team 2, only one man (the original Chairman) is gone, but his absence has a crucial impact. As we see in Table 1, age heterogeneity, functional heterogeneity, industry experience heterogeneity, and personality heterogeneity are largely unchanged. This still seems to be a highly heterogeneous team and now, as some scholars have predicted, this heterogeneity begins to create dissension and to spell growing conflict over both goals and the means to achieve these goals. Even though only one member is changed between Team 1 and Team 2, a once highly decentralized structure and informal decision-making process began to centralize and formalize. Team tenure heterogeneity plunges and this proxy would have best captured the underlying changes taking place as strategic innovation in terms of market positioning diminished, technical product innovation declined, and asset growth slowed.

By the third era, the seven-man Team 3 is radically changed compared to Team 1. On paper, it is still decentralized and the divisional CEOs are still technically part of the dominant coalition, but in reality the dominant coalition is now located at the Head Office, and is much smaller than it seems on paper. With the replacement of the previous divisional CEOs, the group seems to become more heterogeneous if measured by team tenure or functional heterogeneity. Yet, during this time, personality and industry experience heterogeneity move in the opposite direction toward homogeneity.

Although the proxies for cognitive diversity leave an

Figure 1 Comparison of ABC Company Performance to Closest Competitors

Note. The Companies are not identified for reasons of confidentiality.

ambiguous impression, there was no ambiguity in fact. A strict uniformity of policy outlook on the part of the key players of Team 3 prevailed. Multiple points of view were not brought to bear, and as a result there were no conflicts. According to the literature, this homogeneity of outlook should correlate with high performance in a stable industry. Because the financial services industry continued to be highly turbulent with major mergers and acquisitions taking place under continuing worldwide deregulation, the fact that this company experienced financial stress is in the predicted direction. In addition, centralized cost-cutting reduced divisional autonomy and simultaneously starved the divisions of investment in capital assets and R&D; this conforms to the negative pattern identified by Stimpert and Duhaime (1997).

Capturing the Impact of Power on Measures of Heterogeneity

The three teams provide mixed signals about measures of heterogeneity. The two measures which most reliably

capture the decline in cognitive diversity that we see in the cases between Teams 1 and 3 are industry experience heterogeneity and personality heterogeneity, but neither does a very good job unless we are able to take account of power. For example, personality heterogeneity seems to stay quite high in Team 2, declining only slightly from 0.67 to 0.63, yet we know that a significant power shift has taken place that renders that heterogeneity and the diverse cognitive perspectives that it represents less and less influential in the strategic decision-making process. Divisional CEOs are, for example, told what to keep and what to divest, what technology to invest in and at what level, which marketing experiments to undertake and which not, and so on. By the time we arrive at Team 3, these trends have accelerated, but the personality heterogeneity index drops only to 0.38. While this is in the predicted direction, it is only when we take account of power and exclude the two least powerful members that Team 3 reduces to perfect Technocratic homogeneity. But, even this is by no means perfect because it leaves intact the notion of a team of divisional CEOs, when in

fact the “team” has been replaced by powerful head office staff.

We decided to experiment with our own data to see if we could capture the effect of power differences on the measures of heterogeneity. Rather than invent a wholly new power weighting, we adapted one from the literature. In a large sample study, Finkelstein (1988) analyzed power differentials among executives with respect to their influence on three key strategic variables: major resource allocations, organizational design, and domain changes. The more powerful executives scored a power rating of 13.99, versus 9.80 ($p < .001$) for less powerful executives. We used this relative weighting as an index overlaid on our data with surprising results.

With respect to personality, we see in Table 1 that Team 1 is heterogeneous, with Blau's index registering 0.67. Power is highly decentralized, so there is no need to make a power adjustment with this team. Team 2 shows an unadjusted heterogeneity score of 0.63. However, if we inflate the contribution of the Technocratic CEO and COO by weighting it by a factor equivalent to Finkelstein's power differential, the index score for personality heterogeneity falls to 0.55. If we do the same for Team 3, that is, weighting the contribution of the two most powerful members, it falls to zero. While neither perfect nor foolproof (nor mathematically rigorous because the data are categorical), this result brings us to a closer correspondence between top management team heterogeneity and the strategic and structural changes that were taking place across the three eras.

We repeated this procedure with the data on industry tenure which, because we are dealing with a continuous variable, had more mathematical rigor. In the original unadjusted calculations, industry experience heterogeneity was high within Team 1 with a coefficient of variation of 0.87. By Team 2, it had actually increased to 0.89. However, when we applied the power weights by deflating the contribution of all but the CEO and the COO, the coefficient of variance dropped to 0.50—certainly in the right direction to conform to the movements in the cases. Better still, when we applied the calculation to Team 3, the original unadjusted score of 0.44 falls further to 0.25. Of course, this is not the perfect homogeneity captured by the personality data, but industry experience heterogeneity represents a very close proxy, moving from 0.87 to 0.50 to 0.25 across the whole period.

As Table 1 indicates, the same power adjustments performed on team tenure, functional background, and age heterogeneity did not show similarly reliable patterns. Team tenure heterogeneity falls appropriately for Team 2 but then climbs inappropriately in the third period even

weighted for power. Like team tenure, functional background heterogeneity actually climbs in Team 3. Although age was not reliable as a proxy for heterogeneity, increasing from 0.13 to 0.32 adjusted for power, there was a distinct tendency toward youth from 1988 onward. Team 3 is a young team. However, as puzzling as it might be, this team is the least creative, least open-minded, and Team 3's strategy making consisted of cutting divisional investments in product development, training and marketing, selling off divisions and lines of business, and setting unrealistic ROI targets. We turn now to measurement issues with respect to such dependent variables.

Dependent Variables: Innovation, Diversification, and Performance

To help us to clarify some of these issues, we compare our data with three representative studies in the TMT literature to illustrate how the operationalization of the foregoing independent variables can interact with the operationalization of the dependent variables to produce confusing results, false positives or negatives, and/or non-findings. We have chosen these three because they examined the three dependent variables of interest—diversification, innovation, and performance—and because they are all carefully crafted and widely cited. While it is often easy to discount sloppy work and therefore learn nothing, it is instructive to examine why good work may go wrong. Table 2 summarizes the comparative exercise and the explanation of each example follows.

Study 1: TMTs and Innovation

Arguing that a heterogeneous team would be more innovative because of cognitive diversity in problem solving, Bantel and Jackson (1989) studied the relationship between TMTs and innovation in banking. The authors asked the CEO to define the team, and average TMT membership was 6.3 members (with a standard deviation of 1.64). Innovation was operationalized by two scales, one which measured technical product innovation, and the other administrative innovation such as new structures, personnel and compensation policies, or strategic planning. Heterogeneity measures were calculated for age, organizational tenure, functional background, educational level, and educational specialization. Although average educational level did reach positive significance with technical innovation, no heterogeneity measure had a significant relationship with technical innovation. Functional heterogeneity reached significance with respect to administrative innovation. As noted in the introduction, the authors concluded with a plea for field studies to help untangle these results.

Table 2 Comparison of Findings from Large-Sample and Case Research

| Dependent Variable | Operationalization of TMT Cognitive Diversity | Large sample study | Team 1 (*) | Findings Team 2 (*) | Team 3 (*) |
|--|---|--------------------------|----------------|------------------------|----------------|
| Technical Innovation: Bantel and Jackson (1989) | Age Heterogeneity | n.s. | False Negative | False Negative | False Negative |
| | Functional Heterogeneity | n.s. | Positive | Positive | False Negative |
| | Industry Experience Heterogeneity | n/a | Positive | Positive | Positive |
| | Personality Heterogeneity | n/a | Positive | Positive | Positive |
| | OVERALL | n.s. | Positive | Positive | Positive |
| Administrative Innovation: (Bantel and Jackson 1989) | Age Heterogeneity | n.s. | False Positive | False Positive | False Positive |
| | Functional Heterogeneity | Positive | Negative | Negative | False Positive |
| | Industry Experience Heterogeneity | n/a | Negative | Negative | Negative |
| | Personality Heterogeneity | n/a | Negative | Negative | Negative |
| | OVERALL | False Positive? | Negative | Negative | Negative |
| Change in Diversification: (Wiersema and Bantel 1992) | Age Heterogeneity | n.s. | False Negative | Positive | Positive |
| | Organization Tenure Heterogeneity | n.s. | n/a | n/a | n/a |
| | Team Tenure Heterogeneity | n.s. | Positive | False Negative | Positive |
| | Educational Specialization Heterogeneity | Positive | n/a | n/a | n/a |
| | Years of Education Heterogeneity | n.s. | n/a | n/a | n/a |
| | Industry Experience Heterogeneity | n/a | Positive | Positive | Negative |
| | Personality Heterogeneity | n/a | Positive | Positive | Negative |
| | OVERALL | Positive | Positive | Positive | Mixed |
| Performance (Murray 1989) | Temporal Heterogeneity (1) | Positive (LT perf.) | Positive | Positive | False Negative |
| | Occupational Heterogeneity (2) | n.s. | Positive | Positive | False Negative |
| | Industry Experience Heterogeneity | n/a | Positive | Positive | Positive |
| | Personality Heterogeneity | n/a | Positive | Positive | Positive |
| | OVERALL | Positive | Positive | Positive | Positive |

Notes.

(*) All case findings are in terms of computations adjusted for power.

(1) Murray's temporal heterogeneity measure included age, team tenure, and organization tenure heterogeneity. We averaged team tenure and age heterogeneity from the cases to compare to this composite measure.

(2) Murray's occupational heterogeneity measure included functional background and education heterogeneity. We used functional background heterogeneity from the cases for the comparison.

Let us return to the case data from our three teams, and let us suppose that we had wished to correlate measures of team composition with innovation using our power-adjusted case data. Team 1, highly heterogeneous by all measures except age, would show a strong linkage to what might be termed strategic innovation; that is, the team was positioning itself in markets, sectors, and countries that it believed held the highest hope for rents and for staying ahead of the competition. This strategy, driven primarily by the Artists, was in fact, highly innovative during a time when most financial institutions operated in one subsector only. At the same time, because of its decentralized structure and financial success, there was

sufficient organizational slack to devote to product innovation. Long-service Craftsmen in the divisions knew their industry and had the technical expertise to promote and supervise new product development.

As Team 2 begins to take shape and develop, we notice that strategic innovation slows, and that the team is pre-occupied more and more by retreating from certain sectors of activity considered too risky. As emphasis is increasingly put on developing new systems and structures, strategic plans and mission statements, management time (the scarcest of resources) is diverted to these administrative processes and new product development slows. By the time we have reached Team 3, the innovative search

for strategic advantage, either through new product introductions or through exploration of new markets, has halted completely; product development has slowed to a standstill, but administrative “innovation” is paramount. New systems, new reporting relationships, new personnel policies and new internal audit procedures dominate Team 3’s agenda. Throughout the period, functional heterogeneity climbs, and this measure would have correlated strongly with administrative innovation, as it did for Bantel and Jackson.

However, we do have to ask ourselves if this is a telling operationalization of “innovation.” For example, 4 of their 21-item administrative innovation scale relate to strategic planning, yet in spite of recent claims to the contrary (Brews and Hunt 1999, Miller and Cardinal 1994), the performance implications of strategic planning remain controversial (Ansoff 1994, Bresser and Bishop 1983, Mintzberg 1994, Pearce et al. 1987).³ In our cases, both Artists and Craftsmen felt little need for formal strategic plans. While they were in a powerful majority position in the TMT, both strategic innovation and technical product innovation were high. This leads us to believe that Bantel and Jackson (1989) were on firm theoretical ground, and that they might have been able to demonstrate more significant relationships between team heterogeneity and technical innovation had they been able to use a personality measure of heterogeneity or its best substitute here, industry experience heterogeneity, both controlled for power.

In fact, there are several reasons why TMT industry experience heterogeneity might be linked to innovation. Eisenhardt and Schoonhoven (1990, p. 510) argued that,

People with long experience in the industry bring a knowledge of how the industry operates. Those with less experience bring freshness in perspective. These different points of view encourage conflict which, in turn, counteracts the danger that the team reaches premature closure or has an insufficient airing of alternatives.

In addition to these direct effects, industry tenure differences may also be capturing underlying personality differences. “Stable” and “predictable” Craftsmen, for example, tend to have very long tenure in their industry. What we see in the cases is that, beginning with Team 2 and accelerating throughout Team 3, younger men are being hired who have less experience in the industry. The Technocrats do not value the contribution of the Craftsmen, tend to equate experience with outmoded ideas, and see the Craftsman’s natural prudence as intellectual inferiority. They fire them. They see Artists as “dreamers,” and the decentralization that spawns innovation as costly, messy, and risky; the members of Team 3 are all very

“conservative” men. Having little knowledge of the industry or its products, the only form of “innovation” of which they are capable is administrative. It is not surprising, therefore, that once Team 3 is in power, administrative innovation drives out more important forms of innovation.

Had we tried to correlate performance with administrative innovation only, we would be faced with the paradoxical result that high innovation is bad for performance. This demonstrates the critical interaction between the operationalization of both independent and dependent variables. With problems with both, we may get aberrations. Table 2 compares the Bantel and Jackson (1989) results with the case results. We see, for example, that their results for age, functional background heterogeneity, and technical innovation were nonsignificant. Our case data using these two proxies would have produced a confusing pattern of false negatives and positives, whereas both industry experience and personality heterogeneity produce consistently positive correlations between heterogeneity and technical innovation. Similarly, age and functional background heterogeneity produce an inconsistent pattern of false positives and negatives with administrative innovation, whereas both industry experience and personality heterogeneity correlate consistently negatively with administrative innovation.

Study 2: TMTs and Diversification

On the assumption that diversification posture represents an important aspect of TMT strategic decision making as companies seek to navigate toward sectors of highest potential, Wiersema and Bantel (1992) attempted to explore the relationship between team heterogeneity and change in diversification. Team heterogeneity was operationalized by age, by organizational and team tenure, by number of years of education, and by educational specialization. The TMT was defined as the two highest levels of management based on titles; the average team size was 4.3 (with a .95 standard deviation). Strategic change was operationalized by the net change in the amount (but not the direction) of diversification over a three-year period. Only one heterogeneity measure, educational specialization reached significance. The authors concluded (Wiersema and Bantel, 1992 p. 115) that, “group diversity on age, and of organizational tenure, and team tenure may not adequately capture the underlying constructs of creativity-innovativeness and diversity of information,” and expressed regret at not having used industry experience as a measure of heterogeneity because “managers with varied industry experience will think more broadly about the diversification possibilities a firm might pursue.”

Unfortunately, their study does not permit us to rule out age and team tenure as proxies for the independent variable because, as we show below, the results may have been confounded by the operationalization of the dependent variable. The field work casts some doubt that the absolute change in diversification posture over a three-year period is an adequate proxy for strategic creativity. In the first instance, at the time that Team 1 was engaged in its diversification thrust, it was pioneering and ahead of many other financial services firms. Beginning with Team 2 and accelerating with Team 3, the diversification posture was reduced to two sectors only, a clear strategic retreat which would be difficult to classify as “innovative.” It is not clear that measuring the net absolute change, and not its direction, would be able to capture strategic innovation.

Table 2 compares once again the large-sample data with the case data. Whereas Wiersema and Bantel's (1992) results for age and team tenure were nonsignificant, our case results with these proxies produce a confusing pattern of negatives, positives, and false negatives. Worse, whereas in the innovation study above both industry experience and personality heterogeneity produce consistent and interpretable correlations with both technical and administrative innovation, here even they do not work. If we look at the results for industry experience heterogeneity, for example, we would see that high heterogeneity correlates with a period of increasing diversification for Team 1. With Team 2, both diversification activity and heterogeneity slow. However, by Team 3, heterogeneity continues to fall but diversification activity increases, producing a negative correlation. This confusion arises because the dependent variable captures absolute changes but not their direction.

Further, in our cases we see that a significant net change in strategic posture took many more than three years to accomplish. The high level of diversification seen during the Team 1 era was the result of the Chairman's twenty-year effort, and the retreat took more than ten. It was not at all unusual for the process of one divestiture alone to take years: from first doubts, to confirmatory studies, to sending out “feelers” about buyer interest, to hiring a broker, to negotiating a deal, to due diligence, to signing off. Changing the posture as a whole in a magnitude that would reach statistical significance takes much longer than the three-year period used in this study.

With this study, we see the critical interaction of the operationalization of both independent and dependent variables that may result in nonfindings where real findings were possible, and prevents us from disqualifying some operationalizations of heterogeneity. Once again we

see a haphazard pattern of results even with relatively good proxies.

Study 3: TMTs and Performance

Establishing significant relationships between the TMT and some measure of strategic change, such as innovation or diversification, is very difficult. With numerous moderating and intervening variables between the team and its eventual performance, finding significant relationships would appear to be almost impossible, and yet several scholars have done so (Boeker 1997, Eisenhardt and Schoonhoven 1990, Murray 1989). Murray (1989) hypothesized that TMT heterogeneity would be positive for long-term performance (because the inclusion of different points of view would promote adaptation necessary for the long term) and negative for short-term efficiency (because different points of view might produce conflict and slow decision making). These relationships, he hypothesized, would be moderated by the rate of change and rivalry within the industry because such change would require more creative adaptation.

His data covered the more turbulent oil industry and the more stable food industry. The proxy used to explore the efficiency argument was an index of multiple measures of short-term financial performance, such as return on equity, and the adaptation proxy was represented by multiple measures of long-term performance including stock price to market value. Heterogeneity was operationalized by two composite indexes representing temporal heterogeneity (age, tenure in the team, tenure in the organization) and occupational heterogeneity (functional background and education). In spite of the complexity of the task, the relationship between temporal heterogeneity and long-term adaptability did reach significant levels for the oil industry, and thus constituted a strong result. However, only three out of sixteen possible direct effects of heterogeneity measures were significant.

We believe the cases help to show why Murray's (1989) hypotheses, although on theoretically strong ground, produced empirical results weaker than he had hoped. If we look at Team 1, we see a strong relationship between growth, a high ratio of stock price to book value (140% in a private transaction culminating in 1985), and virtually all measures of TMT heterogeneity. This conforms to Murray's argument about the benefits of diverse teams with respect to long-term adaptability in a changing industry environment. However, while Team 2 was still heterogeneous by demographic measures, market-to-book value began to fall. By Team 3, many of the demographic measures are still registering relative heterogeneity yet the ratio of stock price to book value has fallen

to 47% compared to the industry leader at 110%. On the other hand, as we see in Table 2, if our measure of heterogeneity is a close approximation and takes account of power, the results would conform perfectly to Murray's hypotheses. In a turbulent and changing industry, the team became more and more homogenous, concentrated less and less on adaptation, and more and more on efficiency (short-term earnings). As a result, it could be argued, the stock price fell.

If the underlying heterogeneity measures pose difficulties, an index of them poses even more. As noted, Murray collapsed different demographic features into two indexes of temporal and occupational heterogeneity. When we combine all of the unadjusted demographic indicators in our data into an index, we see that "average heterogeneity" in Team 1 is 0.63, Team 2 is 0.48, and Team 3 is 0.46. Are these teams then homogeneous or heterogeneous? Multiple proxies seem to cancel one another out and almost guarantee nonfindings. In Table 2, we substitute an average of age and team tenure heterogeneity from the cases for Murray's "temporal heterogeneity", and functional background for his "occupational heterogeneity", and once again we get not only the positive correlations he hypothesized, but also false negatives. We think this may help to explain not just Murray's difficulties but also West and Schwenk's (1996) "resounding nonfindings." These researchers also combined different measures into an index. In the light of our data at least, these nonfindings are not surprising, but they do not necessarily imply, as West and Schwenk suggest (1996, p. 575), that our methods should be "cast aside." They need refinement.

Discussion

We indicated in the introduction that there were many potential explanations for the lack of robust findings with respect to TMT heterogeneity. Our overall conclusion from this comparative exercise is that scholars have been on firm theoretical ground. The relationships typically hypothesized between heterogeneity, innovation, strategic change, and performance are all borne out in our cases, and if large-sample research has for the most part been unable to demonstrate them consistently, it has been largely for methodological reasons. We conclude with some suggestions for researchers pursuing large-sample studies of top management team heterogeneity.

Selecting the Sample

The cases show that extra care is needed in sample selection. Caution is in order when using a database like

PIMS or the one used by Chattopadhyay et al. (1999), which includes information on subsidiaries of large corporations. For example, in our data, by Team 3 the TMTs of supposedly autonomous divisions no longer had an impact either on the strategic decision-making process or on performance. They received instructions from corporate head office and carried them out in spite of independent boards, separate financial reporting, and in many cases, publicly traded shares, which all gave the impression of autonomy. We have no way of knowing how often this situation prevails in other corporate groups, but capturing such entities in the sampling could confound or seriously attenuate results. For example, such a team may be highly heterogeneous by all measures, and yet its strategy may be inimical to innovation because of operating instructions received from head office. Asking such a team if it is autonomous invites a socially acceptable response. Perhaps consulting financial analysts on at least a subset of the sample could offer a partial check on the problem.

Defining the Team

As we have seen, researchers have used a variety of means to arrive at a suitable measure of the team: surveys of the CEO (Bantel and Jackson 1989, West and Schwenk 1996), all officers reporting to the CEO (Boeker 1997, Sutcliffe 1994), all officers on the board (Finkelstein and Hambrick 1990, Halebian and Finkelstein 1993), first-level officers (Murray 1989), titles of vice-president or higher (Keck and Tushman 1993, Krishnan et al. 1997, Michel and Hambrick 1992), or interviews with the CEO (Eisenhart and Schoonhoven 1990, Iaquinto and Frederickson 1997, Knight et al. 1999, Smith et al. 1994). Of all such measures, we believe that having the CEO define the team with either surveys or interviews represents the best hope for accuracy.

As we see in our cases, arbitrarily selecting the "top-level" (divisional CEOs) would have corresponded to the real team during Team 1; they were not VPs but they did all report to the CEO. By Team 2, VPs at Head Office began to have influence. Although divisional CEOs still reported to the CEO of the group and on paper formed the TMT, they were less and less part of the decision-making process. By Team 3, Head Office VPs and one divisional CEO were in the "team." The only way to account for the great variety of power arrangements is to ask without "leading the witness". In answering an open question such as, "Who are the people you work most closely with?", the chairman of Team 1 would have mentioned the key divisional CEOs and the President. The

Chairman of Team 2 would have mentioned the COO and two divisional CEOs early on, but only the COO and two Head Office VPs by the end. The Chairman of Team 3 would have mentioned 3 VPs and one divisional CEO. Researchers may also consider sending an instrument like Iaquinto and Frederickson (1997) that described several types of strategic decisions and asked the CEO to identify which top managers would be involved in them.

Taking Account of Power Differentials

Questioning the CEO about team membership has an advantage above and beyond the issue of the accuracy of team membership. Indirectly, it tackles the power problem. If the CEO fails to include levels (VP) or people (direct reports) whom we might imagine to be in the team, it is because they are not powerful. CEO identification of the team may actually be the only way in which we need to adjust for power differentials in the team. On the other hand, Eisenhardt and Bourgeois (1988) surveyed power differentials directly with CEO interviews, with convincing results. Although we chose to use the power weighting that emerged from Finkelstein's (1988) study, his proxy for power differentials (inside board members versus nonboard members) does not address the problem of powerless team members among the nonboard members, and may, therefore, leave too much "noise" in the data. Further, in pursuit of more "independent" and vigilant boards, pressure is mounting to minimize the number of officers on boards, such that this proxy for power differentials will be less and less useful.

Measuring Heterogeneity

While all proxies for cognitive diversity suffer in comparison to measuring cognitive diversity itself, in our study industry experience heterogeneity came a close second. Previous large-sample research (Eisenhardt and Schoonhoven 1990, Smith et al. 1994) using industry experience heterogeneity also showed significant results. Because the goal is to boost significantly, but not necessarily perfectly, the explanation of variance, this proxy may be a very acceptable substitute. We say "may" because large-sample replications using this proxy and simultaneously controlling for power are needed before we can say "definitively."

Personality is complex and difficult to measure, but perhaps we need not go that far. Different personalities spawn different attitudes and beliefs. For example, in our cases, we saw that the personality pattern labeled Artist included beliefs about goals and means-ends relationships quite different from the two other archetypes: The Artist

believes that constant growth and strategic innovation are necessary to success; the Technocrat believes that such things should take a backseat to efficiency considerations. The Craftsman puts his faith in product development.

Priem (1990) found that a top manager's normative beliefs about strategy-structure-environment fit had a direct impact on actual strategic decisions. One recent study (Chattopadhyay et al. 1999) identified top manager's beliefs using well-established scales (Beyer et al. 1997) with respect to normative beliefs (i.e., rating of 17 different goals) and means-ends relationships (e.g., how certain variables would affect long-term profitability). Another study found that deep-level attitudinal differences are much more potent in group interactions than surface-level demographic differences (Harrison et al. 1998). While using belief scales may not be a perfect substitute for in-depth personality assessment, measuring key attitudes to organizational goals and means may sufficiently pick up these underlying personality differences, so as to make the greater and time consuming effort of measuring personality itself unnecessary.

Measuring Outcomes

In strategic management, scholars' ultimate goal is to be able to advise managers about success factors. Our dependent variables must be operationalized such that we are confident that our results will eventually be interpretable in terms of better management. For example, the Wiersema and Bantel (1992) study and, more recently, Boeker (1997) measured net absolute change in diversification posture. While both studies showed significant relationships between some form of team heterogeneity and diversification, because they did not measure the direction of change they do not permit us to advise managers with respect to the impact of heterogeneous teams on diversification and, hence, on performance. While these studies represent a good beginning, we argue from our data that the direction of diversification change is as important as its magnitude, and that future studies should take this into account.

Similarly, no firm relationships have been established between administrative change such as planning activities and personnel policies, and ultimate performance. On the other hand, product innovation is directly established (Dougherty 1992, Jelinek and Schoonhoven 1990). The Bantel and Jackson (1989) study cited above was also a good beginning, but if researchers want to measure innovation, and we believe this is an important dependent variable, it should be operationalized by reliable indicators with a proven relation to ultimate performance (e.g., R&D, new product introductions, etc). In fact, these

researchers did have a good measure for technical innovation, but failed to get results because of the operationalization of cognitive diversity.

With respect to performance itself, we think Murray did a tremendous job of developing composite measures of short-term and long-term performance. Yet, he himself felt that his own measures were plagued by time-lag questions and suggested that “strategic eras” should be used. The strategic eras that he had in mind were defined by “stable environmental conditions” (Murray 1989, p. 139). We would add “strategic eras” defined by the reign of the CEO. In addition, TMT goals are related to the appropriate operationalization of the dependent variable. In the Eisenhardt and Schoonhoven (1990) study, sales growth and not profit was the relevant measure of successful performance; in our study, assets and the ratio of market-to-book value was appropriate to the TMT goals.

Finally, and more generally, we believe our field work demonstrates that statistical work linking some features of the TMT to strategic outcomes of critical importance to managers needs to continue. While investigating intervening team processes and interactions (Amason 1996, Knight et al. 1999, Smith et al. 1994) may be of intrinsic scholarly interest and complementary to the direct linking of team composition to outcomes, it is not a substitute. Insights drawn from our cases, corroborating as they do some earlier statistical results, can inform the design of large-sample upper echelon research on TMT heterogeneity going forward, and drive it in the direction of a replication strategy (Hubbard et al. 1998) which will produce more robust results for scholars and managers. In a not-too-distant future, management scholars may be in a position to tell managers that research proves beyond the shadow of a doubt that TMT heterogeneity is vital to innovation and to corporate success, that they should be prepared to experience and even encourage the conflict that it may engender, and that the team leader (whatever his or her title may be) will need to be a rigorously open-minded executive capable of living with forthright colleagues.

Conclusion

Linking the cognitive diversity of TMTs to strategic outcomes has proven problematic; statistical results have often been nonsignificant, weak, or inconsistent with previous work. Some (Finkelstein and Hambrick 1996) have offered theoretical explanations for the weakness, while others have attributed it to methodological problems (West and Schwenk 1996). At the beginning of this article, we outlined five potential reasons. Number one was

that our theory is fundamentally flawed, and team composition does not materially affect strategic outcomes. We believe our cases show the contrary. Number two, while cases cannot adequately address moderator variables such as industry, our cases do lend indirect support in the sense that the homogenous Team 3 was inappropriate to the turbulent competitive environment in which it operated, and the organization ultimately disappeared. Number three advanced the idea that neglected intervening variables like team process may be as important as composition per se and, thus, confound results. Our cases seem to demonstrate this effect as the interplay of personality and power in the teams had a direct influence on strategic outcomes, and even the best proxies for cognitive diversity fail to track these developments unless adjusted for power. Number four addressed the potential pitfalls involved in our operationalizations of both dependent and independent variables leading to insignificant results or false positives and negatives that contradict other work. We believe Table 2 shows this pattern. For example, in the first study, Bantel and Jackson (1989) had a good operationalization for technical innovation but a tenuous operationalization of heterogeneity, and got insignificant results. Their operationalization of innovation as administrative change and Wiersema's and Bantel's (1992) operationalization of strategic innovation as absolute change in diversification both resulted in what may be false positives or negatives. With respect to number five, by creating an index of demographic heterogeneity measures, Murray (1989) and West, Schwenk (1996) may have inadvertently attenuated results. We believe we are on firm ground to assert that the previous lack of consistently strong findings is the result not of theoretical, but of methodological, problems and we have made some suggestions to correct them.

We believe that this work demonstrates the fruitful collaboration of large-sample and longitudinal case research. Here, the cases demonstrate the critical importance of both personality and power and their impact on heterogeneity proxies for cognitive diversity. They show why some forms of heterogeneity may be more important than others with respect to strategic outcomes like innovation and performance. More generally, cases can be used to clarify constructs and relationships and contribute both to refining and to speeding up research to make it more useful to managers. We strongly encourage other qualitative researchers to include such considerations in their research designs.

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Appendix. Adjective Check List

Subject: _____ Observer: _____

From among the following list of words, please check those that most apply to the person concerned. You may check as many words as you see fit.

- | | |
|------------------------|------------------------|
| 1 [] volatile | 31 [] exciting |
| 2 [] humane | 32 [] warm |
| 3 [] stable | 33 [] uncompromising |
| 4 [] unpredictable | 34 [] emotional |
| 5 [] well-balanced | 35 [] stiff |
| 6 [] controlled | 36 [] intense |
| 7 [] funny | 37 [] trustworthy |
| 8 [] people-oriented | 38 [] meticulous |
| 9 [] serious | 39 [] energetic |
| 10 [] imaginative | 40 [] dedicated |
| 11 [] thoughtful | 41 [] detail-oriented |
| 12 [] predictable | 42 [] generous |
| 13 [] daring | 43 [] punctual |
| 14 [] helpful | 44 [] visionary |
| 15 [] conventional | 45 [] easy-going |
| 16 [] bold | 46 [] realistic |
| 17 [] amiable | 47 [] open-minded |
| 18 [] conservative | 48 [] analytical |
| 19 [] intuitive | 49 [] entrepreneurial |
| 20 [] honest | 50 [] knowledgeable |
| 21 [] distant | 51 [] determined |
| 22 [] insightful | 52 [] steady |
| 23 [] straightforward | 53 [] methodical |
| 24 [] cerebral | 54 [] polite |
| 25 [] brilliant | 55 [] reasonable |
| 26 [] hard-working | 56 [] inspiring |
| 27 [] sensible | 57 [] fastidious |
| 28 [] difficult | 58 [] hard-headed |
| 29 [] wise | 59 [] non-nonsense |
| 30 [] responsible | 60 [] other |

Endnotes

¹The corporation is disguised to preserve confidentiality and is sometimes referred to as ABC corporation.

²Because the ten observers per subject were different, standard interrater reliability tests were impossible. This measure is based on agreement of seven or more observers out of ten on a given adjective, and is conservative because it does not count close substitutes such as "daring" and "bold" as agreement.

³Both Brews and Hunt (1999) and Miller and Cardinal (1994) have recently claimed to have put the debate to rest, yet both studies raise serious methodological issues. For example, Miller and Cardinal (1994, 1996) write, "When industry effects are uncontrolled, an archival source of performance data is used, only standardized or formalized planning is measured, and a low-quality assessment strategy is used, the expected correlation is $-.05$." The Brews and Hunt study uses perceptual measures of both planning and performance (not archival) and informal, as well as, formalized planning procedures casting doubt

on the comparability of this research with other research based upon the more common conception of strategic planning as a formal, highly structured process.

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