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THE TOP MANAGEMENT TEAM AND CORPORATE PERFORMANCE

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This research tested the relationship between the characteristics and background of U.S. top executives, and measures of corporate performance. Data were obtained from 953 top managers; the dominant coalition of the largest 150 companies within five U.S. industries—dairy, footwear, tyres, mobile homes, and machine tools. Results were generally positive: managerial characteristics not only predicted performance variations within industries—the top performers having significantly different managerial profiles than poorly performing companies—but also that the characteristics of managers within high-performing companies were similar across *the five industries.*

THEORETICAL DEVELOPMENT

The search to explain corporate performance variability both within, and across, industries has developed from what are essentially inanimate variables—strategy/structure relationships (Scott, 1971; Wrigley, 1971; Channon, 1976), or from definitions of strategic typologies (Rumelt, 1974). In the genesis of strategic management, early focus was therefore upon the choice of what constituted an appropriate strategy (for a comprehensive review, see Hofer and Schendel, 1980), a focus which shifted towards the more animate problems of implementation (e.g. Peters and Waterman, 1982), and, more recently, upon the impact of the dominant coalition within the top management team (TMT). Does, in fact, top management matter? Whereas the population ecologists (Hannan and Freeman, 1977) consider the TMT to be but a passive agent in the determination of corporate performance, or whereas some scholars (e.g. Pfeffer and Salancik, 1978) consider top management's role to be mainly symbolic, alternative theory contends that the characteristics of the TMT could well provide useful indicators of corporate competitive performance.

Drawing upon the literature from organizational behaviour and strategic management, Hambrick and Mason (1984) advanced 21 propositions relating to TMT characteristics which purported to explain, partially, organizational performance—their 'upper-echelon' theory which focuses upon the pinnacle of the organization's structural hierarchy. Their propositions were grouped into seven categories—age-related, functional experiences, corporate influences, education, socioeconomic background, stockholding, and group heterogeneity. It should be emphasized that their theory was advanced with a heavy emphasis upon data which could easily be accessible from secondary sources: 'In taking this approach, we are bypassing some complex psychological issues in favor of an emphasis on broad tendencies which, if empirically confirmed, can be later held up to the psychologist's finer lens'; thus issuing a caveat which helps to accelerate theoretical development, whilst being mindful of its potential limitations.

In the first U.S. test of the theory, a number of the propositions have found support in the study of Hambrick and D'Aveni (1985) who, using a matched-pair design, compared the TMT characteristics of 60 large U.S. companies which

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experienced bankruptcy within the period 1970–82, to that of financially successful companies within the same industry classification. Characteristics of bankrupt TMTs showed a greater preponderance of throughput functional experience (e.g. production, process engineering, accounting) than output functions (e.g. marketing, sales, product R&D), of shorter tenure, of fewer technical degrees but more MBAs and BBAs, and of fewer outside directors. This study thus provides justification for further investigation across a more extensive population on both an inter- and intra-industry basis.

Contemporaneous to this U.S. development, European academics also considered the characteristics of top management and corporate performance worthy of research. Drawing heavily upon leadership studies, in addition to organizational behaviour and strategic management, Norburn (1986) tested the characteristics of top managers who formed the dominant coalition within the U.K.'s largest companies against the financial performance of those industries in which they were strategically competing. Norburn's 64 independent variables were categorized into similar constituencies to that of Hambrick and Mason—characteristics hypothesized to be influenced by corporate experiences, by domestic and educational experiences, and by their own self-concept. Despite the broader nature of this particular research, considerable support emerged for the proposition that top management characteristics would be significantly different within industry sectors of growth, turbulence, and decline. Although focusing upon the wider aggregates of inter-industry managerial characteristics, rather than an intra-industry emphasis, it strongly recommends future avenues for research in the same general direction of Hambrick and Mason.

A third stream of evidence supporting further investigation of upper-echelon theory emanates from the literature of the succession theorists. Whereas most studies concern the internal or external origins of the chief executive officer (CEO) rather than that of the wider constituency of the TMT, controversy as to the impact by the CEO upon corporate outcomes is evident. One school argues that larger organizations appear to run themselves, being minimally impacted by the CEO (Hall, 1980; Mintzberg, 1979), a view supported by the population ecologists (e.g. Hannan and Freeman, 1977). A second school argues the reverse, holding that leadership accounts for a significant amount of the unexplained variance in corporate performance (Lieberson and O'Connor, 1972; Shetty and Perry, 1976; Wiener and Mahoney, 1981), although the latest empirical study (Lubatkin and Chung, 1985), fails to support this view. This very controversy within the camp of the succession theorists adds momentum for the need to widen the debate to include the TMT on a multi-dimensional spectrum.

INTRA- VS. INTER-INDUSTRY

Hambrick and Mason's theory is limited specifically to intra-industry variability—'Because of the effect of industry characteristics, all the propositions . . . should be thought to carry the implicit phrase, "within an industry"'—thus making an *a priori* assumption that one particular industry environment will condition managerial characteristics to such a degree that inter-industry differences could be invalid. That inter-industry differences *are* indeed evident has been demonstrated by Norburn's U.K. study. Norburn grouped his 108 companies representing 18 standard industrial classifications (SIC) into three performance categories relative to the underlying GNP momentum at constant factor cost—those in growth (GOGOs); in turbulence (YOYOs); and in decline (DODOs). Whereas significant managerial differences were demonstrated *between* the three categories of industry performance, particularly with regard to those variables which he classified as being within the corporate constituency, distinct similarities were demonstrated *within* the three.

Whereas Hambrick and Mason are rightly concerned with the 'masking' effect of *prima facie* differences across industries, and whereas Norburn's methodology precluded intra-industry performance variation, it is our view that upper-echelon theory would be subject to a more stringent test if both intra-industry differences *and* inter-industry similarities emerged across high-, or low-performing companies. This would extend Hall's (1980) empirical investigation of U.S. declining industries which revealed that those companies which had shown the highest corporate performance over the previous 5

years had all adopted similar strategies despite competing within eight entirely different SICs. By introducing this element of managerial characteristics as an explanatory variable, positive results could also support the statement of Buzzell, Gale and Sultan (1975): 'that the simplest of all explanations for the market share/profitability relationship is that both share and ROI reflect a common underlying factor: the quality of management'.

THIS RESEARCH

This research seeks therefore to establish the extent of similarity and difference of top management characteristics from five U.S. industries. The data were analysed to address three broad questions:

1. To what extent would upper-echelon propositions be supported on an inter-industry basis?
2. Would these propositions explain corporate performance variability within each industry?
3. If so, what commonality existed across the five industries when dichotomized into high- and low-performance categories within each industry?

The first question directly tests Norburn's U.K. results within a U.S. context; the second tests the majority of Hambrick and Mason's propositions; the third attempts to extend the power of upper-echelon theory beyond the constraints of single industries.

In Norburn's British study, variables were grouped into three constituencies—those factors of potential influence emanating from childhood, parental and educational experiences; those from within a company context with regard to managerial 'grooming'; and those which were considered as perceptual—their 'self-concept'. Given the emphasis by Hambrick and Mason that TMT characteristics should be accessed from data readily available, Norburn's third category of self-concept was eliminated from this research, its validation being reliant upon primary data sources.

It should be emphasized, however, that the 21 Hambrick and Mason propositions were advanced both as 'illustrative' [sic] and with 'caveats for theory building and research design'. Consequently when their caveat of the data being readily accessible is applied, empirical investigation utilizing secondary data sources removes a substantial number. Their remaining testable propositions, together with those analysed within the U.K. by Norburn, are seen in Table 1. These form the 11 propositions central to this research in the two groupings of corporate and non-corporate factors. This division of variables as to managerial influencing factors has been also supported at both the entrepreneurship level (Cooper, 1981) and with multi-nationals (de la Torre and Toyne, 1978).

Corporate factors

The importance of functional experience and its effect upon perceptions of different trading environments has been developed by Lawrence and Lorsch (1967), Hayes and Abernathy (1980), and by Miles and Snow (1978). Length of tenure and stability of company performance are linked by Shetty and Perry (1976), and by Kotter (1982). The relationship between certain leadership experience and corporate trading environments is debated by Vroom and Yetton (1973), Osborne and Hunt (1975), Pfeffer and Salancik (1978), and by Yukl (1981). Handy (1976), Norburn and Miller (1981), and Leontiades (1982) all stress the importance of relating the breadth of managerial experience in multiple trading conditions.

Non-corporate factors

On both sides of the Atlantic—in England, Channon (1976), and in the United States, Collins and Moore (1970), Miner (1975), and Pfeffer (1981)—type of education is thought to predict membership of managerial level. With regard to age, youthfulness has been related to risk propensity (Child, 1974), and to the ability to consider commercial solutions from a wider set of options (Hart and Mellons, 1970).

METHODOLOGY

Population

Industry

Based upon dual criteria of a range of sales revenue and employment levels over the time

Table 1. Upper-echelon propositions

		Hambrick and Mason	Norburn
Corporate influence			
P1	Degree of output-function experience will be positively associated with growth.	*	*
P2	Throughput-function experience will be positively associated with financial performance in stable industries.	*	*
P3	Output-function experience will be positively associated with financial performance in turbulent industries.	*	*
P4	Years of tenure will be positively associated with financial performance and growth in stable industries.	*	*
P5	Years of tenure will be negatively associated with financial performance and growth in turbulent industries.	*	*
P6	Number of companies worked for will be positively associated with growth and financial performance.	—	*
P7	Number of management functions experienced will be positively associated with growth and financial performance.	—	*
P8	Number of directorships will be positively associated with growth and financial performance.	—	*
Non-corporate influence			
P9	'Youthful' TMTs will show greater growth than industry means than will older TMTs.	*	*
P10	The amount of formal education will be positively associated with growth and financial performance.	*	*
P11	The type of degree—arts or science—will be associated with financial performance and growth.	—	*

* Source of proposition.

frame 1980–84, upon a mix of both consumer and industrial end-user SICs, of different concentration ratios, and of differing technologies, five industries were chosen to test for both intra- and inter-industry similarities and differences. Whereas it is not claimed that these five are representative of U.S. industry as a whole, they do qualify to be categorized into those industry performance constituencies as defined both by Norburn, and by Hambrick and Mason. Of the five industries seen in Table 2, dairy and footwear were in relative growth, tyres and mobile homes were comparatively volatile and machine tools was in decline.

Companies

The source of secondary data as justified earlier in this paper derived from the Dun and Bradstreet *Handbook of Corporate Leaders*, 1984, which lists the backgrounds of all TMT members comprising the largest 6000 U.S. corporations. Within each of the five industries, only those companies which listed the industry SIC as their *predominant* activity were chosen. The summary characteristics of the resultant sample are listed below:

Total number of firms	= 150
Total number of executives	= 953
Size of top management team:	
Mean	= 6.35
Median	= 5
Range	= 1–28
Executive directors:	
Mean	= 2.47

Table 2. Industry performance

	Growth		Volatile		Decline:
SIC	Dairy (202)	Footwear (314, 3021)	Tyres (3011)	Mobile homes (2451)	Machine tools (3541, 3542, 3544)
Current sales ($m)					
Mean	930	257	1691	251	180
SD	2168	535	2484	646	224
Skewness	+ ve	+ ve	+ ve	+ ve	+ ve
Median	148	102	464	74	105
No. observations	48	30	16	21	25
Total employees					
Mean	5950	5294	18600	2364	2452
SD	16367	10110	34401	5580	3041
Skewness	+ ve	+ ve	+ ve	+ ve	+ ve
Median	549	2100	4450	1000	1300
No. observations	50	31	17	25	27
Sales growth (%)					
Mean	36	66.7	8.13	−0.67	−6.5
SD	21	184.3	3.7	33.7	20.8
Skewness	~	+ ve	~	~	~
Kurtosis	−0.472 SE 1.964		−0.47 SE 1.932	−0.69 SE 1.939	1.65 SE 1.943
Median	38	24	5	0	−4.5
No. observations	46	29	15	21	24
Employment growth (%)					
Mean	5.4	3.7	−7.9	2.2	−25.3
SD	19.9	24.8	23.6	42.2	15.1
Skewness	~	~	~	+ ve	~
Kurtosis	2.545 SE 1.966	0.441 SE 1.951	−0.631 SE 1.938		−0.910 SE 1.946
Median	0	1.5	−6.5	0	−22
No. observations	49	31	16	25	26
Sales/employee					
Mean ($'000)	390	84	806	92	74
SD	330	105	2207	29	31
Skewness	+ ve	+ ve	+ ve	~	~
Kurtosis				1.055 SE 1.939	1.224 SE 1.945
Median	260	50	110	80	60
No. observations	48	30	16	21	25
No. of companies	50	31	17	25	27
No. of executives	250	202	164	106	231

Source: Duns market identifiers

Median = 2
Range = 1–11

Senior vice-presidents
Mean = 0.34
Median = 0
Range = 0–6

Other officers:
Mean = 3.93
Median = 3
Range = 0–6

Data collected

For each executive member of the TMT the following data were collected:

Personal — Age, sex, marital status
Education — University degrees, graduation dates
Employment pattern — Date started work, number of firms worked for, date joined current firm, date took current job, number of jobs current firm, number of directorships
Career path — Starting function, ending function, main career function.

Sixty-three per cent of the executives in the sample had attained a first degree; of these, 57 per cent were science degrees, 33 per cent arts degrees, and 9 per cent business degrees. Only six universities accounted for more than 1 per cent of the sample. These are, ranked in order, Ohio State, Yale, Wisconsin, Purdue, Michigan, and Princeton—this predominance of Mid-West Universities reflects the historic base of three of the industries (dairy, mobile homes and machine tools).

Twenty-seven per cent of executives also possessed a second degree, 52 per cent being MBA and 29 per cent JD. In this case only Harvard and Michigan accounted for more than 1 per cent of the sample.

Twenty-two per cent of the sample held the title Chairman or CEO. The ratio of senior to junior executives in the TMT was 1 : 1.8. The most frequent starting function, and main career path, was finance or accounting, whilst the main ending function was that of general management.

Performance

To ensure compatibility, corporate performance data from those companies listed within the five industries from the Dun and Bradstreet *Handbook of Corporate Leaders* was taken from the Duns market identifier files. Whereas sales revenue data were available for the entire population, profitability performance was not, since the shareholding in a large number of the population was in private ownership. Four measures were, however, common for all companies: current sales, total employees, sales growth percentages, and employment growth percentages. Accordingly, tests were conducted to determine the extent of potential substitution between these measures for both intra- and inter-industry comparison. Results from these tests showed that whereas sales revenue and employee size may be substituted for comparison ($p<0.05$), the remaining measures should be taken on an individual basis. Had the population within the five industries been limited to publicly traded companies solely, a measure of profitability would have been chosen as an additional criterion for organizational performance. However, since the research design mandated TMT characteristics of *all* major producers within an industry, sales per employee, rather than accounting profitability, was chosen as a measure for corporate productivity, thus reducing the risk of possible bias in interpretation by excluding those major producers whose ownership lay within private hands. Nevertheless it is important to underline that interpretation of the analysis should take into account two caveats resulting from these measures. First, sales growth and employment growth were data extracted from the Duns market identifier files covering a short period of time; and second, there has been no attempt to examine the 'success' of the firm, but rather its current corporate 'performance'.

The criteria of corporate performance therefore delineate into measures of size (sales revenue), of momentum (sales growth and employment growth), and of productivity (sales per employee).

Statistical analysis

Analysis of variance was conducted to test for relationships between the performance measures and TMT characteristics—for metric data, regression analysis and ANOVA; for non-metric data, chi-squared tests of homogeneity. When analysing the non-metric data, firms were classified as high or low performers relative to the median in the industry. Stepwise discriminant

analysis was also conducted, but the results are not included in this paper since the proportion of missing values made the results potentially misleading.

RESULTS

Inter-industry analysis

Top management characteristics would differentiate relative to industry performance.

Hambrick and Mason cite Harris's (1979) study of railroad executives to warn of the dangers of comparing executive characteristics where their host industries exhibit disparate growth. Norburn's study developed this concept of potential dissimilarity across the spectrum of industry performance, but posited that TMT characteristics would 'cluster' if industries were segmented upon a criterion of growth, of turbulence, or of decline. His U.K. results supported these propositions, particularly with regard to functional experience, tenure and education. Exploring this direction, results from within the five U.S. industries are shown in Tables 3 and 4.

The obvious conclusion from Tables 3 and 4 is the striking dissimilarity across the five industries. Of the 20 variables analysed, seventeen (85 per cent) showed a significant difference. The caveat from Hambrick and Mason therefore appears prudent. However, sufficient *prima facie* similarities emerged within the industry performance groupings of growth and decline to add support to Norburn's propositions within a U.S. context. Applying Kendal's coefficient of concordance to the rankings of propositions 4, 5, 6 and 9 in Table 3, no significant difference was found to exist (W=0.67, S=176, critical value

Table 3. Inter-industry characteristics: metric data (Analysis of variance between groups)

		Mean	S.D.	No. obs.	'F'	S.L.	Industry ranks*				
							A	B	C	D	E
P4/5	Date started work	1955	9.8	788	2.790	0.026	4	3	2	5	1
P4/5	Date joined firm	1964	13.5	815	5.141	0.000	3	4	2	5	1
P4/5	Date current job	1974	11.7	757	3.120	0.015	4	2	5	1	3
P6	No. firms worked for	2.3	1.4	871	3.301	0.011	2	4	1	5	3
P7	No. jobs held	4.9	4.3	681	4.446	0.001	3	2	5	1	4
P7	No. jobs current firm	3.1	2.5	817	23.297	0.000	3	2	5	1	4
P9	Date of birth (age)	1930	9.6	887	4.943	0.001	2	4	1	5	3
P9	Graduation date	1953	9.5	523	2.952	0.020	4	2	3	5	1
P9	2nd degree date	1959	11.9	223	1.682	N.S.	—	—	—	—	—

* Low rank = low number: A = dairy; B = footwear; C = tyres; D = mobile homes; E = machine tools.
N.S. = not significant.

Table 4. Inter-industry characteristics: non-metric data

		χ^2	Degrees of freedom	Significance level
P1/3/7	Job title	16.55	12	N.S.
P1/P3/P7	Ending function	32.5	8	0.00
P2	Main career path	71.1	28	0.00
P7	Starting function	82.9	24	0.00
P8	Directorships	46.8	4	0.00
P10	University degree	93.1	4	0.00
P10	2nd degree	2.4	4	N.S.
P11	Type of degree	24.6	8	0.02
P11	Type of 2nd degree	26.18	12	0.01
	Sex	13.4	4	0.01
	Marital status	7.92	4	0.09

N.S. = not significant.

of *S* at 5 per cent SL=112.3). Thus, the TMT of dairy and footwear (GOGOs) were younger, showed a smaller tenure within their current firm, and had worked for fewer firms, a result in counter-point to that of machine tools (DODOs). Education further delineated between the groups: the greater the number of first-degree graduates, the less productive the industry. Moreover the DODOs were more likely to have studied science, whereas the GOGOs showed a greater preponderance for liberal arts. This educational demarcation continued in terms of functional experience once the new graduate entered industry. DODOs entered as throughput functionalists, whereas GOGOs and YOYOs were more likely to have started their experience with output functions. In general, results for the two industries in turbulence—mobile homes and tyres (YOYOs)—reflected their metastable performance and showed little 'clustering' of characteristics.

If the concept of 'upper-echelon' theory is extended to an inter-industry context, these results, summarized in Table 5, show some

Table 5. Summary of inter-industry results

	Proposition	Data collected	Inter-industry
Corporate influence			
P1	Degree of output-function experience will be positively associated with growth.	Job title	N.S.
		Ending function	**
P2	Throughput-function experience will be positively associated with financial performance in stable industries.	Main career path	**
P3	Output-function experience will be positively associated with financial performance in turbulent industries.	Job title	N.S.
		Ending function	**
P4	Years of tenure will be positively associated with financial performance and growth in stable industries.	Date started work	**
		Date joined firm	**
		Date current job	**
P5	Years of tenure will be negatively associated with financial performance and growth in turbulent industries.	Date started work	**
		Date joined firm	**
		Date current job	**
P6	Number of companies worked for will be positively associated with growth and financial performance.	No. of firms worked for	*
P7	Number of management functions experienced will be positively associated with growth and financial performance.	No. jobs held	**
		No. jobs current firm	**
		Job title	N.S.
		Starting function	**
		Ending function	**
P8	Number of directorships will be positively associated with growth and financial performance.	No. of directorships	**
Non-corporate influence			
P9	'Youthful' TMTs will show greater growth than industry means than will older TMTs.	Date of birth (age)	**
P10	The amount of formal education will be positively associated with growth and financial performance.	Graduation date	**
		2nd degree date	N.S.
		University degree	**
		2nd degree	N.S.
P11	The type of degree—arts or science—will be associated with financial performance and growth.	Type of university degree	*
		Type of 2nd degree	*

* Significant at 5%; ** significant at 1%; N.S. not significant.

support for the theory of Hambrick and Mason, and partially support Norburn's results on a cross-national basis.

Intra-industry analysis

Top management characteristics will dichotomize relative to corporate performance measures within an industry.

Table 6 shows summary results for metric, and non-metric data, respectively. Again, as with the results for inter-industry comparison, the extent of statistical associations is mixed. Whereas the combined propositions of Hambrick and Mason, and Norburn, posit differing TMT characteristics relative to performance measures, results from these five populations gives less than robust overall support.

Dairy

From the metric data in Table 6, all the significant results show positive associations with sales revenue and employee growth, but are negatively associated with sales growth and sales per employee: the less the tenure and the fewer jobs within their company, the greater both the sales growth and sales per employee.

Footwear

Since footwear was classified as an industry in steady growth, similar results to dairy were expected, but not achieved. Although some patterning was observed—graduation, job tenure—remaining significant results were in antithesis.

Tyres

Few significant results emerged for tyres and, where demonstrated, they clustered within the corporate grouping—tenure, number of companies worked for, number of jobs. Similar to dairy, and footwear, these results were correlated negatively.

Table 6. Intra-industry analysis: significant results

	Variable	Size					Sales growth					Employee growth					Sales/ employee				
		A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E
A. Regression analysis																					
P4/5	Date started work	+	−		+	+	−										−		−	−	+
P4/5	Tenure with company	+				+	−				+	+					−				+
P4/5	Tenure this job	+			+		−		−			+			−		−	−		+	
P6	No. companies worked for	+	−						−						−		−				+
P7	No. jobs any company				+	+	+	−	−		+	+	−		−			−	−	−	
P7	No. jobs this company				+	+	−	−	−			−			−	+	−	−	−		
P9	Age		−			+					+	+	+					−		−	+
P9	Graduation date	+	+		−							+		+			−	−			
P9	Graduation date 2nd degree	+	+	+		+											−	−			
B. Analysis of variance																					
P1/3/7	Job title	*		*	*	*	*							*			*		*		
P2	Main career	*	*			*	*					*					*				*
P8	Directorships					*										*					
P10	University degree	*	*	*			*		*							*	*		*		
P10	2nd degree	*				*	*				*	*				*			*		
P11	Type of degree		*		*				*			*	*								
P11	Type of 2nd degree										*										
	Sex																			*	
	Marital status			*											*						

A = dairy; B = footwear; C = tyres; D = mobile homes; E = machine tools.
+ = Positive association: − = negative association.
* Results significant ≤0.10.

Mobile homes

Results were inconclusive for the entire category of sales growth, but were significant for sales revenue—the greater the age and corporate experience, the larger the company: the less the corporate experience, the higher the corporate productivity in terms of sales per employee.

Machine tools

Results for this industry related positively to size of sales revenue. No negative correlations emerged in any of the performance categories. In contrast to the other industries, where youth and corporate inexperience was correlated with sales growth and sales per employee, the machine tool industry showed the reverse association.

From the non-metric data in Table 6, the majority of significant results across all four performance measures grouped mainly within the categories of education and functional experience. In terms of company size the larger the corporation, the larger the number of first- and second-degree graduations. However, with respect to the performance measures of growth and productivity, results showed an inverse relationship—the smaller the number of graduates, the more dynamic would appear to be the corporate result.

Career functional experience also delineated throughput functions demonstrating an association with larger companies, but negatively with performance measures. Output functions (e.g. sales and marketing) showed a positive association, as did a substantial number of years within the general management function.

Inter-industry analysis: high and low performers

Top management characteristics will demonstrate similarity across industries when dichotomized upon a criterion of supra- or subordinate competitive corporate performance.

From the results reported above, the propositions of upper-echelon theory would appear to be supported partially on both an inter- and intra-industry basis. Given this momentum, the propositions were therefore subjected to a more robust test by extending their validity on an inter-industry performance basis. The 953 top managers were grouped into performance categories relative to the median of their industry, and their characteristics tested against this relative performance. Results from this analysis are seen in Table 7.

For metric measures, almost all variables correlate positively with corporate size. The larger the company in its industry, the greater the years of experience since graduation, and in the multiple number of different job exposure both within, and external to, the contemporary corporation. Further, when criteria of growth are applied, it is the older TMTs who predominate, but in the case of corporate productivity it is the 'newcomers' who show the greater momentum.

For non-metric measures the size of the corporation yielded significant results for six of the ten variables. Larger companies had proportionately fewer vice-presidents, employed more women top managers, and employed more graduates from broader academic disciplines, the career path of whom was essentially within throughput functions.

Growth measures showed dissimilar results. Using sales growth as the criterion, high-performing TMTs contained a greater proportion of vice-presidents than presidents, were less likely to employ graduates but, where they did, employees were more likely to have attained a postgraduate qualification. Additionally, more output functional experience was positively associated with superior sales growth.

Conversely, using growth in employment as the criterion, it was the high-growth companies who employed more female, and more single, top managers. High-growth TMTs were more likely to have achieved an MBA and, again, were more likely to have experienced an output functional 'grooming' prior to achieving the upper echelon.

Using sales per employee as the criterion for corporate productivity, high-performers employed proportionately fewer vice-presidents and fewer graduates. As with the growth measures, output functional experience predominated.

CONCLUSIONS

This research tested those propositions of upper-echelon theory available from secondary data

Table 7. Inter-industry high and low performers: significant results

	Variable	Size	Sales growth	Employee growth	Sales per employee
A. Metric data					
	Age		+	+	
P4/5	Date started work	+			−
P4/5	Tenure with company	+	−		
P4/5	Tenure in current job	+	−		
P6	No. companies worked for				−
P7	Total no. of jobs	+			
P7	No. jobs current firm	+	−		
P9	Graduation date	+			
P9	Graduation date 2nd degree	+			
B. Non-metric data					
P1/3/7	Job title	*	*		*
P1/3/7	Ending function		*		*
P2	Main career path	*	*	*	*
P8	Directorships			*	
P10	University degree	*	*	*	*
P10	2nd degree	*	*		*
P11	Type of degree				
P11	Type of 2nd degree	*		*	
	Sex	*		*	
	Marital status			*	

+ = Positive association; − = negative association.
* = Significant results.
All results significant at ≤ 0.10.

sources. Analysis was conducted in three groupings. The first concerned differences in TMT characteristics across industries: the second concerned those differences which might explain company performance variability within individual SICs: the third subjected upper-echelon theory to a more robust examination by testing for TMT similarity of those companies classified as high- or low-performers within their own industry, on an inter-industry basis. Would the propositions of the theory predict performance across the entire population?

Results from the first analysis show quite clearly that the characteristics within those propositions tested from upper-echelon theory are different across the five industries. Nevertheless, on an inter-industry basis, many of the characteristics grouped relative to the individual industry performance—industries in steady growth (GOGOs) employing executives with a greater preponderance both for a liberal arts education and for experience in the output functions. This result gives a degree of support on a cross-national basis for Norburn's study, but with the caveat that the U.S. study covered five SICs as compared to the 18 of the U.K.

Despite the methodological uncertainties of cross-cultural research, described in Sekaran's (1983) study as a 'twilight zone', further investigation into industrial sociologies on a cross-national basis certainly appears merited. This could well extend into the two additional groupings of factors—contextual and environmental—of de la Torre and Toyne (1978) inapplicable for this research, thus widening the search for both similarities and differences labelled by Adler's (1983) typological review as 'universality' and 'cultural specificity'.

With regard to the second area of analysis, results were somewhat mixed, underlining the dangers of enthusiastic generalizability from single-industry data. This is not to claim that the results from this study negate Hambrick and Mason's theory; rather that certain of their groupings of propositions (functional experience, education) are stronger than their others in predicting corporate performance variability within industry norms, thus supporting the

functional theories of Lawrence and Lorsch (1967), Hayes and Abernathy (1980), Miles and Snow (1978), and the significance of education—for example, Channon (1976), and Pfeffer (1981). Clearly, what is needed is a much larger population of industries to ensure a comprehensive mix (e.g. growth rates, technologies, import vulnerabilities) more representative of U.S. SICs as a whole.

It is, however, within the third area of analysis that these authors find the most encouraging results. When the propositions of upper-echelon theory are tested across companies stratified by sub- or supraordinate performance, considerable support is demonstrated. On the evidence from this research it would appear that upper-echelon theory is stronger measured against this third criterion than against a criterion of intra-industry performance. From these results we consider that the theory has survived a more robust test and, as such, should be considered more powerful as a predictive mechanism for corporate performance. Further, by positioning the results of this study with the theoretical hypothesis of Hambrick and Mason (1984), and the empirical data of Norburn (1986), we now advance the theory that:

> *top management teams which demonstrate a preponderance of output functional experience, of multiple company employment, and of wider educational training will outperform those which do not, whether this be upon criterion of inter- or intra-industry productivity.*

We believe that the combination of these three factors creates an environment of managerial development which exposes the embryonic top management to consider external forces, to adapt to different corporate cultures, and to evaluate subjective evidence—a superior managerial 'grooming' for contemporary conditions of increased competitive pressures.

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