



AN EMPIRICAL TEST OF UPPER-ECHELON THEORY

DAVID NORBURN
Professor of Business Policy
Cranfield School of Management

SUE BIRLEY
Research Professor in Entrepreneurship
Cranfield School of Management
Cranfield Institute of Technology
Cranfield, Bedford MK43 0AL
England

Tel : 0234 751122

Submitted to Business Policy and Planning Division;
1986 National Academy of Management Meeting, Chicago.

Working Paper 86.01

Copyright Norburn and Birley

January 1986



AN EMPIRICAL TEST OF UPPER-ECHELON THEORY

ABSTRACT

This research tested the validity of Hambrick and Mason's (1985) upper-echelon theory which posits that the characteristics of top executives will explain, partially, financial performance variations within industries. Data was obtained from 953 top managers, the dominant coalition of the largest 150 companies within five US industries - Dairy, Footwear, Tyres, Mobile Homes and Machine Tools. Results were generally supportive: 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. This greatly increases confidence in predicting superior organisations, and enables the management development function to improve the chances of commercial success of future top managers.

AN EMPIRICAL TEST OF UPPER-ECHELON THEORY

Theoretical Development:

The search to explain financial variability both within, and across, industries has developed from what are essentially inanimate variables - strategy/structure relationships (Scott, 1971; Wrigley, 1971; Channon, 1974) or from definition of strategic typologies (Rumelt, 1974). In the genesis of Strategic Management, early focus was upon the choice of an appropriate strategy (for a comprehensive review see, Hofer & Schendel, 1978), a focus which shifted towards the problems of implementation (e.g., Peters & 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 & Freeman, 1977) consider the TMT to be but a passive agent in the determination of corporate performance, or whereas some scholars (e.g. Pfeffer & Salancik, 1978) consider top management's role to be mainly symbolic, a momentum of scholarship now contends that the characteristics of the TMT could well provide useful indicators of corporate competitive performance.

Drawing upon academic empiricism in the disciplines of Organisational Behaviour, and Strategic Management, Hambrick & Mason (1985) advanced twenty-one propositions relating to TMT characteristics which purported to explain, partially, organisational performance - their "upper-echelon" theory. The propositions were grouped into seven categories - age related, functional experiences, corporate influences, education, socio-economic background, stockholding, and group heterogeneity. It should be emphasised that their theory is advanced with a heavy emphasis upon data which is easily 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 psychologists'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 these propositions have found support in the empirical study of Hambrick and D'Aveni (1985) who, using a matched pair design, compared the TMT characteristics of 60 large U.S. companies which experienced bankruptcy within the period 1970-1982, 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 a solid 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 financial performance worthy of research. Drawing heavily upon Leadership Studies, in addition to Organisational 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 categorised into similar constituencies to that of Hambrick & Mason - characteristics hypothesised 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, with its emphasis upon industry aggregates rather than individual firm performance, considerable support emerged for the proposition that top management characteristics would be significantly different within

industry sectors of growth, turbulence, and decline. Although focussing 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 empirical investigation of upper-echelon theory comes from the literature of the succession theorists. Whereas most of these studies concern the internal or external origins of the Chief Executive [CEO] rather than that of the wider constituency of the TMT, controversy as to the impact by the CEO upon financial outcomes is evident. One school argues that larger organisations appear to run themselves, being minimally impacted by the CEO [Hall, 1977, 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 financial performance [Lieberson and O'Connor, 1972, Shetty and Perry, 1977, 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 specifically limited 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

evident has been demonstrated by Norburn's UK study. Norburn grouped his 108 companies representing 18 Standard Industrial Classifications [SIC] into three categories relative to the underlying GNP momentum at constant factor cost - those in growth [GOGOs]; in turbulence [YOYOs]; and in decline [DODOs]. Significant differences of managerial influential factors emerged, particularly those which he classified as being within the corporate constituency.

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 the view of these researchers 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 [1977] empirical investigation of U.S. declining industries which revealed that those companies which had shown the highest financial performance over the previous five 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 markets share/profitability relationship is that both share and ROI reflect a common underlying factor: the quality of management."

THIS RESEARCH

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

- . To what extent would upper-echelon propositions be supported on an inter-industry basis?

- . Would these propositions explain corporate performance variability within each industry?
- . If so, what commonality exists across the five industries when dichotomised 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 Hambrick & Mason's propositions: the third attempts to extend the power of upper-echelon theory beyond the constraints of single industries.

Population:

(a) Industry: Based upon dual criterion of sales revenue and employment-level trends over the timeframe 1980 - 1984, 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 categorised into those industry performance constituencies as defined by Norburn, and by Hambrick and Mason. Of the five industries seen in Table 1 below, Dairy and Footwear were in relative growth, Tyres and Mobile-Homes were relatively volatile, and Machine-Tools was in decline.

[Insert Table 1 about here]

(b) 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 6,000 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
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 was 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, Career Path.

Sixty three percent of the executives in the sample had attained a first degree; of these, 57% were science degrees, 33% arts degrees, and 9% business degrees. Only six Universities accounted for more than 1% of the sample. These are, ranked in order, Ohio State, Yale, Wisconsin, Purdue, Ann Arbor, 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 percent of executives also possessed a second degree, 52% being MBA and 29% JD. In this case only Harvard and Ann Arbor accounted for more than 1% of the sample.

Twenty two percent of the sample held the title Chairman or CEO, and 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 end function was that of general management.

Performance:

To ensure compatibility, financial performance data from those companies listed within the five industries from the Dun & Bradstreet Handbook of Corporate Leaders was taken from the Duns Market Identifier Files. Whereas sales revenue data was 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: 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 inter-industry comparison, remaining measures should be taken on an individual basis. Had the population within the five industries been limited to publicly-traded companies solely, the use of profitability as a criterion for organisational performance would have been chosen. However, since the research design mandated TMT characteristics of all major producers within an industry, sales per employee was chosen as the measure of corporate productivity.

The criteria of performance therefore delineate into measures of size (sales revenue and numbers employed), 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 financial measures and TMT characteristics - for metric data, regression analysis and ANOVA; for non-metric data, chi-squared tests of homogeneity. 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

1. Inter-Industry Analysis:

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" in industries if segmented upon a criterion of growth, of turbulence, or of decline. His UK results supported these propositions, particularly with regard to functional experience, tenure, and education. Table 2 & 3 below show the results from the five US industries.

[Insert Table 2 and 3 about here]

The obvious conclusion from Tables 2 & 3 is the striking dissimilarity across the five industries. Of the twenty variable analysed, seventeen (85%) 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 turbulence to add support to Norburn's propositions within a US context. Applying Kendal's Coefficient of Concordance to the rankings of factors 1, 2, 4, 5 and 7 in Table 2, no significant difference was found to exist [$W = 0.67$, $S = 176$, Critical Value of S at 5% SL = 112.3]. Thus, the TMT of Dairy and Footwear (GOGOs) were younger, showed a smaller tenure within their current position, in counter-point to those of Machine Tools (DODOs). Education further delineated between the groups: the greater the number of first-degree graduates, the less productive the

industry. Further, 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 were throughput functionalists, whereas GOGOs and YOYOs were more likely to have been disciplined within 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 show some support for the theory of Hambrick and Mason, and partially support Norburn's results on a cross-national basis.

2. Intra-Industry Analysis:

[Insert Table 4 about here]

Table 4 shows summary results for metric, and non-metric data, respectively. Again, as with the results for inter-industry comparison, the number of statistical associations is mixed. Whereas the combined propositions of Hambrick & Mason, and Norburn, posit differing TMT characteristics relative to performance measures, results from these five populations gives less than robust overall support.

(a) Dairy: From the metric data in Table 4, 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.

(b) 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 - low tenure and sales growth - the results within the category of employee growth were in antithesis.

(c) Tyres: Few significant results emerged for Tyres. Where results were 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.

(d) 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. As with Tyres, the less the corporate experience, the faster the growth in Sales Revenue.

(e) Machines 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 growth in Sales and in Sales per Employee, the Machine Tool industry showed the reverse association.

From the non-metric data in Table 4, 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 (Sales Revenue or Number of Employees), the larger the corporation, the larger the number of first-, and second-, degree graduations. However, with respect to the performance measures of growth and profitability, results showed an inverse relationship - the fewer 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.

3. Inter-Industry Analysis: High and Low Performers.

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 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 [see Table 5].

[Insert Table 5 about here]

For metric measures, almost all variables correlate positively with corporate size. The larger the company in both Sales Revenue and in the number of Employees, the greater the years of experience since graduation and in the multiple number of different jobs responsible 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 sales growth, it is the "newcomers" who show the greater momentum.

For non-metric measures, the size of the corporation yielded significant results in six of the ten variables. Larger companies had proportionately fewer vice-presidents, employed more women top managers, 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 TMT's 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

post-graduate 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 performing companies who employed more female, and more single, top managers. 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 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 extended upper-echelon theory 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 from this study. Nevertheless, on an inter-industry basis, many of the characteristics grouped relative to the individual industry performance - industries in steady growth [GOGOs] showing substantial similarity. This result gives a degree of support on a cross-national basis for Norburn's

study, but with the caveat that the US study covered five SICs as compared to the eighteen of the UK.

With regard to the second area of analysis, results were somewhat mixed; underlining the dangers of enthusiastic generalisability 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.

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 supra-ordinate 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.

REFERENCES

- Channon, D. 1974
The Strategy & Structure of British Industry. London MacMillan.
Dun & Bradstreet, 1984
Handbook of Corporate Leaders. New York.
- Hall, W.K. 1980
"Survival strategies in a hostile environment" Harvard Business Review Sept. 75-85.
- Hambrick, D.C. & D'Aveni, R. 1984
"Top Management Characteristics & Strategic Failure". Paper presented at the 4th International Conference. SMS Philadelphia.
- Hambrick, D.C. & Mason, P.A. 1984
"Upper-echelons: the organisation as a reflection of its top managers" Academy of Management Review. Vol. 9. No. 2, April, 1-34.
- Hannan, M.T. & Freeman, J.H. 1977
"The population ecology of organisations". American Journal of Sociology, 82, 929-964.
- Harris, R.G. 1979
"The Potential Effects of Deregulation. Draft report, Washington D.C. Public Interest Economics Center.
- Hofer, C. & Schendel, D. 1979
Strategic Management, Boston, Little Brown & Co.
- Lieberson, S. & O'Connor, J.F. 1972
"Leadership and organisational performance: a study of large corporations". American Sociological Review, 37, 117-130.
- Lubatkin, M. & Chung, K. 1985
"Leadership origin and Organisational Performance in Prosperous and Declining Firms" Proceedings, Academy of Management Conference, San Diego. 25-29.
- Mintzberg, H. 1979
"Organizational power and goals: a skeletal theory", in Hofer & Schendel (Eds.) Strategic Management. Boston. Little Brown & Co., 64-80.
- Norburn, D. 1986
"Gogos, Yoyos, & Dodos: Company directors and industry performance". Strategic Management Journal. Vol.7, No.2.
- Peters, T.J. & Waterman, R.H. 1982
In search of Excellence: lessons from America's best run companies
New York, Harper & Row.
- Pfeffer, J. & Salancik, G.R. 1978
The External control of Organizations. New York, Harper & Row.
- Rumelt, R. 1974
Strategy, Structure, and Economic Performance. Boston Division of Research, Harvard Business School.
- Scott, B.R. 1971
"Stages of Corporate Development". Unpublished paper, Harvard Business School.
- Shetty, Y.K. & Perry, N.S. 1976
"Are top managers transferable across companies"? Business Horizons, 19(3) 23-28.
- Wiener, N. & Mahoney, T.A. 1981
"A model of corporate performance as a function of environmental, organizational, and leadership influences" Academy of Management Journal. 24, 453-470.
- Wrigley, L. 1971
"Divisional autonomy and diversification". Unpublished doctoral dissertation, Harvard Business School.

TABLE 1: INDUSTRY PERFORMANCE

SIC	GROWTH		VOLATILE		DECLINE
	DAIRY	FOOTWEAR	TYRES	MOBILE HOMES	MACHINE TOOLS
	[202]	[314,3021]	[3011]	[2451]	[3541, 3542,3544]
<u>Current Sales \$m</u>					
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
<u>Total Employees</u>					
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
<u>Sales Growth %</u>					
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		-0.47	-0.69	1.65
	SE 1.964		SE 1.932	SE 1.939	SE 1.943
Median	38	24	5	0	-4.5
No. observations	46	29	15	21	24
<u>Employment Growth %</u>					
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	0.441	-0.631		-0.910
	SE 1.966	SE 1.951	SE 1.938		SE 1.946
Median	0	1.5	-6.5	0	-22
No. observations	49	31	16	25	26
<u>Sales/Employee</u>					
Mean (\$'000)	390	84	806	92	74
SD	330	105	2207	29	31
Skewness	+ VE	+ VE	+ VE	~	~
Kurtosis				1.055	1.224
				SE 1.939	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

TABLE 2: 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
1. Date of Birth (Age)	1930	9.6	887	4.943	0.001	2	4	1	5	3
2. Graduation date	1953	9.5	523	2.952	0.020	4	2	3	5	1
3. 2nd degree date	1959	11.9	223	1.682	N.S**	-	-	-	-	-
4. Date started work	1955	9.8	788	2.790	0.026	4	3	2	5	1
5. Date joined firm	1964	13.5	815	5.141	0.000	3	4	2	5	1
6. Date current job	1974	11.7	757	3.120	0.015	4	2	5	1	3
7. No. firms worked for	2.3	1.4	871	3.301	0.011	2	4	1	5	3
8. No. jobs held	4.9	4.3	681	4.446	0.001	3	2	5	1	4
9. No. jobs current firm	3.1	2.5	817	23.297	0.000	3	2	5	1	4

* Low rank = low number: A = Dairy; B = Footwear; C = Tyres; D = Mobile Homes; E = Machine Tools

** NS = Not Significant

TABLE 3: INTER-INDUSTRY CHARACTERISTICS; NON-METRIC DATA

	X ²	Degrees of Freedom	Significance Level
Job title	16.55	12	N.S*
Sex	13.4	4	0.01
Marital Status	7.92	4	0.09
University degree	93.1	4	0.00
Type of degree	24.6	8	0.02
2nd degree	2.4	4	N.S.
Type of 2nd degree	26.18	12	0.01
Starting function	82.9	24	0.00
Ending function	32.5	8	0.00
Main Career Path	71.1	28	0.00
Directorships	46.8	4	0.00

* NS = Not Significant

TABLE 4: 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				
Age	- +	+ +	+ +	- - +
Graduation Date	+ + - +	-	+ +	- - - +
Grad. Date Second Degree	+ + + +	-		- - - +
Date Started Work	+ - + +	-		- - - +
Tenure with Company	+ + + +	- +	+ +	- - - +
Tenure this job	+ + + +	- -	+ -	- - - +
No. companies worked for	+ - + +	- -	- -	- - - +
No. jobs any company	+ + + +	+ - - +	+ - -	- - - -
No. jobs this company	+ + + +	- - -	- - +	- - - -
b) Analysis of Variance				
Job Title	* * * *	*	*	* *
Sex				*
Marital	*		*	
Univ. Degree	* * *	* *		* *
Type of Degree	* *	* *	* *	
Second Degree	* *	* *	* *	*
Type of Second Degree			*	
Main Career	* *	* *	*	* *
Directorships		*	*	*

- . A = Dairy; B = Footwear; C = Tyres; D = Mobile Homes; E = Machine Tools
- . + = positive association; - = negative association
- . * = Results significant <0.10

TABLE 5: INTER INDUSTRY HIGH AND LOW PERFORMERS; SIGNIFICANT RESULTS

VARIABLE	SIZE	SALES GROWTH	EMPLOYEE GROWTH	SALES PER EMPLOYEE
<u>A. METRIC DATA</u>				
Age		+	+	
Graduation Date	+			
Graduation Date, Second Degree	+			
Date Started Work	+			-
Tenure with Company	+	-		
Tenure in Current Job	+	-		
No. Companies Worked For				-
Total No. of Jobs	+			
No. Jobs Current Firm	+	-		
<u>B. NON-METRIC DATA</u>				
Job Title	*	*		*
Gender	*		*	
Marital Status			*	
University Degree	*	*	*	*
Type of Degree Second Degree	*	*		*
Type of Second Degree	*		*	
Ending Function		*		*
Main Career Path Directorships	*	*	*	*

+ = Positive Association; - = Negative Association

* = Significant Results

All Results Significant at ≤ 0.10