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Measuring Strategic Performance

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Summary
This paper demonstrates the inadequacy of traditional measures, that are based on a firm's profitability, for evaluating its strategic performance. Two other measures, one that attempts to assess the quality of a firm's transformations (and not merely its outcomes) and the other that attempts to measure the satisfaction of all of the firm's stakeholders (and not merely its stockholders), are shown here to be important discriminators of strategic performance. The performances of seven 'excellent' firms from the computer industry, featured in the recent book by Peters and Waterman, are contrasted with that of seven 'non-excellent' firms from the same industry, to develop a framework for measuring strategic performance.

Strategic management is the process through which managers ensure the long-term adaptation of their firm to its environment (Chakravarthy, 1981; Miles, 1982; Miles and Snow, 1978; Zammuto, 1982). Useful measures of strategic performance are therefore those that help assess the quality of a firm's adaptation.

Organizational performance (Child, 1974, 1975; Lenz, 1981; Thorelli, 1977), and organizational effectiveness (Cameron and Whetten, 1983; Evan, 1976; Ghorpade, 1970; Goodman and Pennings, 1977; Spray, 1976; Steers, 1977) are but two of the labels under which aspects of strategic performance have been researched. Despite these attempts there is little agreement on how strategic performance should be measured (Cameron and Whetten, 1983). Some authors have even suggested that the construct be abandoned altogether (Goodman, 1979; Hannan and Freeman, 1977). It can be argued, however, that without a performance referent managers cannot objectively or consistently evaluate the quality of their strategic decisions.

This paper seeks to identify useful measures of strategic performance that can help distinguish well-adapted firms from mal-adapted ones. It is divided into three sections. The first section discusses the research design used for the study. The next section evaluates some of the current perspectives on measuring strategic performance and points to their limitations. The third section analyzes alternate perspectives on measuring strategic performance that focus on the quality of the firm's 'slack' management and the satisfaction that a firm provides its various stakeholders. The paper concludes with a proposal for measuring strategic performance.

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RESEARCH DESIGN

In search of a sample

The basic approach used in this study was to select a sample of well-adapted and mal-adapted firms from the same industry, and then to identify performance measures that best distinguished the two groups. A vexing problem was to assess the quality of a firm's adaptation without falling into the tautological trap of arbitrarily using a performance measure for that purpose.

In theory, the quality of a firm's adaptation can be evaluated on a number of dimensions. These include whether:

1. a firm's strategy is congruent with its industry structure (Porter, 1980) and competitive context (Buzzell, Gale and Sultan, 1975; Henderson, 1979);
2. its organization structure fits its environment (Lawrence and Lorsch, 1967) and strategy (Chandler, 1962; Rumelt, 1974);
3. its management systems fit its strategy and organization structure (Miles and Snow, 1978; Vancil, 1979); and
4. its management style is tailored to its strategic context (Mintzberg and Waters, 1983).

In short, a well-adapted firm must be able to match its strengths with the opportunities in its environment; and to align its various administrative systems to its chosen strategy (Pascale and Athos, 1981). In popular parlance, such a firm must have an effective strategy, and efficient synchronization of its 7-Ss. Fashioned by McKinsey, the management consulting firm, the 7-Ss are the so-called hard Ss of *s*trategy, *s*tructure and *s*ystems; and the soft Ss of *s*tyle, *s*hared values, *s*taff and *s*kill.

Appealing as the above framework is, it is difficult and time-consuming to classify the quality of adaptation of a firm based on whether it enjoys all of the above fits. The popular book on 'excellence' by Peters and Waterman (1982) was therefore very useful for this study. Both Peters and Waterman were consultants with McKinsey at that time and used the 7-S framework to guide their research. Given their privileged access as consultants, they were able to verify the fit between the 7-Ss in several of the 'excellent' firms cited by them. Firms that enjoyed superior fit between their 7-Ss were 'especially adroit at continually responding to change of any sort in their environments' (Peters and Waterman, 1982: 12). 'Excellent' firms were internally well fitted and externally well adapted.

Subjective and partial as Peters and Waterman's validation may be (Carroll, 1983), it still represents the only attempt at systematically examining the quality of adaptation in a large sample of companies. Moreover, each of the 62 firms short-listed by them was identified as well adapted by 'an informed group of observers of the business scene—businessmen, consultants, members of the business press, and business academics' (Peters and Waterman, 1982: 12). For purposes of this paper, therefore, 'excellence' as used by Peters and Waterman and quality of adaptation are treated synonymously. Performance attributes that discriminate 'excellence' also discriminate the quality of a firm's adaptation. They are reasonable measures of strategic performance.

It must be mentioned that Peters and Waterman subsequently applied two performance screens to further refine their sample. The first was financial performance. An 'excellent' firm had to be in the top half of its industry in at least four of the following six measures over a 20-year period, 1961 through 1980: compound asset growth, compound equity

growth, ratio of market to book value, average return on total capital, average return on equity, and average return on sales. The second was a measure of innovativeness. Select industry experts were asked to rate the companies in their industry on their 20-year record of innovating bellwether products and services, and on their ability to adapt rapidly to changing industry conditions. As will be discussed later in the paper, some of these measures are necessary conditions for 'excellence'. However, the financial criteria in particular were not sufficient to discriminate 'excellence' in the Peters and Waterman sample.

This paper seeks to find a better definition of the performance profile of an 'excellent' firm. Such a profile can then form the basis for measuring strategic performance.

The sample

The structure of the industry in which a firm operates constrains its strategies and affects its performance (Porter, 1980). Given the difficulties in comparing performance across industries (Hirsch, 1975), only firms from a single industry, computers, were chosen for this study. The computer industry had the highest representation of 'excellent' firms (seven) among the industries studied by Peters and Waterman. The choice of this industry was also influenced in part by the difficulties in getting business-level performance statistics for diversified firms. Firms in the computer industry have been predominantly single-business firms, with very little diversification outside the industry. Their aggregate performance can therefore be used as a close surrogate for the performance of their computer business units.

The seven 'excellent' firms in the computer industry are IBM, Hewlett Packard (HP), Digital Equipment Corporation (DEC), National Cash Register (NCR), Amdahl, Wang, and Data General. The first three are among the handful of exemplar firms that were frequently cited by Peters and Waterman to illustrate various traits of 'excellence'.

The 'excellence' of the five larger firms chosen (excluding Data General and Amdahl) is also corroborated by the *Fortune* magazine survey of corporate reputations (Table 1). For the past 3 years, *Fortune* (1983, 1984, 1985) has been polling senior industry executives, outside directors and financial analysts knowledgeable about the computer industry (one of 20 industries surveyed), to score the reputation of its 10 biggest competitors on eight different performance attributes. The three exemplar companies in our sample ranked overall among the top four in their industry (Table 1). In fact, IBM and Hewlett Packard have been consistently placed among the top five in the entire sample of 200 companies surveyed by *Fortune*.

Table 1. Ranking of Corporate Reputations (average score)

	1982	1983	1984
1. IBM	8.26	8.53	8.44
2. Hewlett Packard	8.26	8.24	8.08
3. Digital Equipment	7.70	7.24	6.86
4. Wang	7.35	7.22	7.07
5. NCR	5.76	6.29	6.07
6. CDC	6.12	5.98	5.50
7. Honeywell	5.67	5.79	5.78
8. Burroughs	5.05	5.04	5.33
9. Sperry	4.93	5.16	5.00

Sources: *Fortune*, 10 January, 1983, pp. 34–44; *Fortune*, 9 January, 1984, pp. 50–62; *Fortune*, 7 January, 1985, pp. 18–30.

Table 2. The Sample

SI no	Company name	SIC code[a]	Evaluation by Peters and Waterman	1983 sales ($ billion)	1983 *Fortune* rank
1	IBM	3680	Exemplar	40.18	5
2	Hewlett Packard (HP)	3680	Exemplar	4.71	75
3	Digital Equipment (DEC)	3680	Exemplar	4.27	84
4	NCR	3680	Excellent	3.73	101
5	Wang	3681	Excellent	1.54	227
6	Data General	3682	Excellent	0.83	335
7	Amdahl	3682	Excellent	0.78	350
8	Honeywell	3680	–	5.75	60
9	Sperry	3680	–	4.91	66
10	Control Data	3680	–	4.58	76
11	Burroughs	3680	–	4.30	82
12	Commodore	3681	–	0.68[b]	–
13	Prime Computer	3682	–	0.52	451
14	Cray Research	3682	–	0.17	–

[a] 3680: Electronic computing equipment; 3681: Computers—mini and micro; 3682: Computers—mainframe.
[b] Unranked in *Fortune* 500 because complete year's results were unavailable at the time of ranking.

The above sample of seven firms was then expanded to include seven other 'non-excellent' firms: Burroughs, Control Data Corporation (CDC), Sperry, Honeywell, Prime Computers, Cray, and Commodore. They were selected for three reasons:

1. Their omission from the short list of firms proposed by industry experts in the Peters and Waterman survey is construed here as evidence of their lack of 'excellence'. The corporate reputations of these 'non-excellent' firms, where available, was also lower than that of the 'excellent' firms (with the exception of NCR in 1983) in the *Fortune* survey (see Table 1).
2. Each of the selected 'non-excellent' firms has been held publicly since 1977, when Peters and Waterman first began their survey. Newer firms may not have been considered by industry experts in responding to that survey.
3. The selected firms belong to the same three SIC groups as the 'excellent' firms: electronic computing equipment (SIC 3680), mini and micro computers (SIC 3681), and mainframes (SIC 3682). The three groups are represented by eight, two, and four firms respectively, with equal numbers of 'excellent' and 'non-excellent' firms in each (Table 2).

The performance of the 14 firms, as reported in the Standard and Poor's Compustat data base, was analyzed on a variety of criteria. The more discriminating a performance criterion is in distinguishing 'excellence' from 'non-excellence', the more useful it is for measuring strategic performance.

CONVENTIONAL MEASURES OF STRATEGIC PERFORMANCE

Measures of profitability

A recent survey of performance measures used in research on strategic management, identified 14 distinct quantitative measures: Return on Investment, Return on Sales,

Growth in Revenues, Cash Flow/Investment, Market Share, Market Share Gain, Product Quality Relative to Competitors, New Product Activities Relative to Competitors, Direct Cost Relative to Competitors, Product R&D, Process R&D, Variations in ROI, Percentage Point Change in ROI, and Percentage Point Change in Cash Flow/Investment (Woo and Willard, 1983). The authors factor-analyzed the 14 variables using the PIMS data base and isolated four factors which they named: profitability, relative market position, change in profitability and cash flow, and growth in sales and market share. Of these, again, the profitability factor demonstrated the highest factor magnitude. The primary variables that loaded on this factor were Return on Investment, Return on Sales, and Cash Flow to Investment, with the first and third variables being highly correlated.

Woo and Willard concluded that profitability measures such as Return on Investment (ROI) and Return on Sales (ROS), despite their many limitations (Dearden, 1969; McGuire and Schneeweis, 1983; Reece and Cool, 1978), were important measures of performance:

> Despite the problems inherent in ROI (Return on Investment), results from this study would support the continued use of this measure. The profitability factor demonstrated the highest factor magnitude (explaining 17.7 percent of the variance) and significantly exceeded the magnitude of the second factor, relative market position (which explained 10.7 percent of the variance). . . . When properly complemented by other measures, this study shows that ROI is essential to the comprehensive representation of performance (Woo and Willard, 1983: 13)

This was an encouraging conclusion given that data on two of the four factors, i.e. relative market position and growth in sales and market share, are not readily available for all businesses. The data are proprietary to the PIMS data base, limited therefore only to its members, and even then revealed not by company but only in aggregate form.

Return on Total Capital and Return on Book Equity are two popular variants of the ROI measure. Three variables associated with the profitability factor, Return on Sales, Return on Total Capital, and Return on Book Equity, were used to analyze the performance of the 14 computer companies in the sample (Table 3). These incidentally were also the three profitability screens used by Peters and Waterman (1982).

The mean performance of each firm was compared on the three profitability measures with other firms in the sample. Tukey's (1953) standardized range test was used for the multiple comparison of means. Repeated *t*-tests were not used because with 91 different comparisons (14 companies paired two at a time), the chance of making at least one type 1 error approaches 1. The Tukey procedure controls MEER (maximum experimentwise error rate under any complete or partial null hypothesis) at specified α levels—0.05 in this study. It also allows for an unequal number of observations, due to varying ages of the firms in the sample.

It must be noted, however, that the Tukey procedure is a conservative one. Its failure to reject the null hypothesis, that the means of the two companies compared are equal, does not imply that the population means are in fact equal. It only suggests that the difference between the two population means, if any, is not large enough to be detected with the given sample size.

None of the three measures of profitability was able to clearly distinguish 'excellent' firms from 'non-excellent' ones, despite their use as performance screens by Peters and Waterman (who incidentally must have merely looked at the means without examining the associated standard deviations). Table 4 summarizes the results of the pairwise comparison of mean

Table 3. Comparison of profitability (1964–83)

Company	No. of years	Return on sales		Return on total capital		Return on book equity	
		mean	SD	mean	SD	mean	SD
Excellent companies							
IBM	20	13.43	0.93	34.06	3.75	19.02	2.28
HP	20	8.27	0.80	29.12	4.31	15.44	2.17
DEC	18	9.75	1.45	26.94	14.92	16.17	7.10
NCR	20	4.42	3.26	16.65	8.54	10.03	6.95
Wang	17	8.90	2.12	29.84	21.14	20.33	9.39
Data General	14	9.66	3.27	26.10	9.38	15.15	5.47
Amadahl	8	10.24	8.31	33.21	26.50	19.92	16.51
Non-excellent companies							
Honeywell	20	4.54	1.02	18.85	3.17	12.38	2.47
Sperry	20	4.17	1.06	19.16	4.70	10.49	2.57
Control Data	20	4.40	2.69	10.49	4.81	7.16	3.93
Burroughs	20	7.10	2.78	18.28	4.83	11.15	3.16
Commodore	19	5.92	8.91	26.55	36.00	14.22	47.80
Prime Computers	9	9.25	2.07	29.88	5.66	28.71	10.09
Cray Research	7	17.30	2.24	27.60	10.33	17.13	4.93

Source: Compustat Data Base.

performances using the Tukey procedure. The table shows firms whose performance differed significantly from the focal firm on the three chosen measures:

1. The Return on Equity (ROE) measure did not show any significant difference between 'excellent' and 'non-excellent' firms. This came as a surprise given that ROE is a popular measure of performance.
2. Return on Total Capital (ROTC) was only marginally better as a discriminator. In fact the only conclusive finding using this measure of performance was that five of the seven 'excellent' companies (with the exception of NCR and Data General) outperformed Control Data.
3. While the performance of the 14 firms was more distinguishable on the Return on Sales (ROS) criterion, it did not help separate 'excellent' and 'non-excellent' firms in any consistent fashion. Several 'excellent' firms like Hewlett Packard, DEC, Wang, Data General and Amdahl were indistinguishable from 'non-excellent' firms like Burroughs, Commodore and Prime Computers. Cray Research, a 'non-excellent' company, outperformed six of the seven 'excellent' companies (with the exception of IBM) on this criterion; and NCR, an 'excellent' company, was surpassed on ROS by all other 'excellent' companies and two other 'non-excellent' companies, Prime Computers and Cray Research. Apart from demonstrating IBM's superiority, the ROS criterion was not very helpful in distinguishing the performance of other firms.

Conventional profitability criteria are incapable, then, of distinguishing differences in the strategic performances of the computer firms in the sample.

Financial-market measures of performance

Measures of performance rooted in financial accounting, such as the ones described above, have come in for a lot of recent criticism (McGuire and Schneeweis, 1983). The problems

Table 4. Companies in the sample significantly[a] different in their performance when compared with excellent firms

Excellent firms	Return on sales		Return on total capital		Return on equity		*Z* factor		Market to book ratio	
	Other excellent firms	Non-excellent firms	Other excellent firms	Non-excellent firms	Other excellent firms	Non-excellent firms	Other excellent firms	Non-excellent firms	Other excellent firms	Non-excellent firms
1. IBM	HP NCR Wang	Honeywell Sperry Control Data Burroughs Commodore	NCR	Control Data Burroughs	None	None	None	None	None	None
2. HP	IBM[b] NCR	Sperry Control Data Cray Research[b]	None	Control Data	None	None	NCR	Sperry Control Data	None	None
3. DEC	NCR	Honeywell Sperry Control Data Cray Research[b]	None	Contrc Data	None	None	NCR	Honeywell Sperry Control Data Burroughs	NCR	Sperry
4. NCR	IBM[b] HP[b] DEC[b] Wang[b] Data General[b] Amdahl[b]	Prime Computers[b] Cray Research[b]	IBM[b]	None	None	None	DEC[b] HP[b] Data General[b]	None	DEC[b] Wang[b]	None
5. Wang	IBM[b] NCR	Honeywell Sperry Control Data Cray Research[b]	None	Control Data	None	None	None	None	NCR	Honeywell Sperry Control Data Burroughs
6. Data General	NCR	Honeywell Sperry Control Data Cray Research[b]	None	None	None	None	Amdahl NCR	Sperry Control Data Commodore Prime Burroughs Honeywell	None	None
7. Amadahl	NCR	Honeywell Sperry Control Data Cray Research[b]	None	Control Data	None	None	Data General[b]	None	None	None

[a] Turkey's Standardized Range Test for unequal cell sizes. Confidence = 0.95.
[b] Indicates performance was significantly inferior when compared with these companies. Significantly superior otherwise. Level of significance = 0.05.

that have been cited with this approach are: (1) scope for accounting manipulation; (2) undervaluation of assets; (3) distortions due to depreciation policies, inventory valuation and treatment of certain revenue and expenditure items; (4) differences in methods of consolidating accounts; and (5) differences due to lack of standardization in international accounting conventions.

Moreover, accounting-measures-of-performance record only the history of a firm. Monitoring a firm's strategy requires measures that can also capture its potential for performance in the future. The spread between the market and book values of the firm has been shown to be a measure of the perceived ability of the firm to return to its stockholders an amount in the future in excess of their expected return (Rappaport, 1981). M/B ratio is therefore a more appropriate measure of a firm's strategic performance. Peters and Waterman used this measure as a performance screen to evaluate the long-term wealth creation potential of a firm. However, the measure is not entirely free from accounting manipulations—the book value of a firm can be distorted.

The M/B ratios from 1964 to 1983 for the 14 firms in the sample are shown in Table 5. Surprisingly, there was once again no statistically significant difference (at 0.05 level) on a pairwise comparison of the mean M/B ratios of the 14 companies over the period 1964–83. Digital Equipment (DEC) and Wang were the two major exceptions. They outperformed NCR and Sperry on this criterion (see Table 4).

It is interesting to observe, however, that the M/B ratios of all companies in the sample declined in the period 1964–83. Moreover, the spread between the M/B ratios of various computer companies was also much smaller in 1983 than it was in the 1960s. This may reflect either the financial market's skepticism about the industry's future prospects or its concerns over increasing competition in the industry. In the past two decades the financial market has only rewarded new entrants to the computer industry with a high premium over book value, and that too for the first few years after initial entry. This has been true both in the case of micro-computer manufacturers like Wang and Commodore, as well as mainframe manufacturers like Data General and Prime Computers.

Therefore the declining M/B ratio for a particular computer company is not so much an indictment of its strategy as it is a recognition of the increasingly tougher industry environment in which it operates. Instead of absolute M/B then, the M/B ratio relative to

Table 5. Market to book ratio (1964–83)

Company	SIC code	1964	1967	1970	1973	1976	1979	1980	1981	1982	1983	Mean (1964–83)	S.D. (1964–83)
Excellent companies													
IBM	3680	6.41	9.18	6.12	4.11	3.30	2.51	2.40	1.85	2.90	3.21	4.72	2.21
HP	3680	4.40	7.68	3.87	6.25	3.62	2.83	3.48	2.52	3.90	3.74	4.86	1.91
DEC	3680	—	26.71	7.25	5.04	3.45	2.49	2.62	1.75	1.74	1.15	7.29	7.89
NCR	3680	2.38	3.03	1.39	1.14	1.10	1.33	1.27	0.67	1.27	1.76	1.54	0.74
Wang	3681	—	65.35	6.86	2.51	1.47	6.85	10.90	4.25	6.13	5.00	10.03	15.37
Data General	3682	—	—	9.38	8.35	3.75	2.18	2.12	1.47	1.01	1.80	4.27	3.15
Amdahl	3682	—	—	—	—	4.59	2.10	2.37	1.91	1.92	1.91	2.87	1.18
Non-excellent companies													
Honeywell	3680	3.27	4.54	2.63	1.48	0.94	1.19	1.40	0.81	0.96	1.39	2.18	1.40
Sperry	3680	1.13	3.69	1.13	1.56	1.14	0.99	1.12	0.63	0.64	0.91	1.39	0.72
Control Data	3680	6.24	12.24	1.18	0.63	0.50	0.78	0.92	0.83	0.81	0.95	2.26	2.99
Burroughs	3680	1.21	6.19	3.40	4.11	2.47	1.51	1.05	0.66	0.86	1.02	2.98	1.98
Commodore	3681	—	—	—	—	1.15	5.08	13.87	7.54	9.46	6.65	5.00	4.39
Prime Computers	3682	—	—	—	—	6.71	6.43	12.18	4.89	4.73	3.11	5.80	2.78
Cray Research	3682	—	—	—	—	—	5.90	8.68	5.24	3.87	4.70	5.46	1.91

Source: Compustat Data Base

Table 6. Standardized market to book ratio

Company	1965	1967	1969	1971	1973	1975	1977	1979	1981	1983
Excellent companies										
IBM	1.64	−0.28	−0.02	−0.70	0.32	0.51	0.68	−0.28	−0.39	0.26
HP	1.33	−0.36	−0.05	0.50	1.18	1.70	0.12	−0.13	−0.10	0.55
DEC	—	0.64	1.79	0.87	0.70	1.36	0.06	−0.29	−0.44	−0.91
NCR	−0.70	−0.60	−0.72	−1.30	−0.87	−1.04	−1.15	−0.82	−0.91	−0.56
Wang	—	2.66	1.84	1.58	−0.32	−0.80	−0.05	1.73	0.67	1.27
Data General	—	—	—	0.91	2.03	1.08	0.77	−0.43	−0.56	−0.54
Amdahl	—	—	—	—	—	—	1.17	−0.47	−0.36	−0.48
Non-excellent companies										
Honeywell	−0.04	−0.52	−0.51	−0.32	−0.73	−1.05	−1.36	−0.89	−0.85	−0.77
Sperry	−1.14	−0.57	−0.89	−1.21	−0.70	−0.73	−1.29	−0.98	−0.93	−1.04
CDC	−0.01	−0.012	−0.77	−1.33	−1.07	−1.28	−1.60	−1.08	−0.84	−1.02
Burroughs	−0.83	−0.44	−0.21	−0.03	0.33	0.24	−0.55	−0.74	−0.92	−0.98
Commodore	—	—	—	—	—	−0.68	0.25	0.91	2.12	2.20
Prime	—	—	—	—	—	0.54	1.73	1.53	0.95	0.20
Cray Research	—	—	—	—	—	—	0.51	1.75	1.10	1.10

Source: Compustat Data Base.
Standardized by year: mean = 0, S.D. = 1.

the industry is perhaps a more meaningful measure of a computer company's strategic performance. The M/B ratios of all companies in the sample were standardized using industry mean and standard deviation on M/B in a given year (assuming that the industry was represented by the 14 firms in the sample). Further, to neutralize the declining trend in M/B over the past 20 years, each year's industry mean was set to zero and its standard deviation set to 1. In other words, the standardized M/B value measures used in this study represent the number of standard deviations a firm's M/B ratio was from the industry average in a given year (Table 6).

Table 6 shows some interesting patterns. Firstly, while 'excellent' companies did not always have the best M/B ratio, they consistently performed above the industry mean. IBM, Hewlett Packard, Wang and DEC exemplify this quality. Their standardized M/B ratio was negative very infrequently when compared to firms such as Honeywell, Sperry, and Control Data. However, the performance of NCR, an 'excellent' company, was generally indistinguishable from that of several 'non-excellent' companies, all showing M/B ratios below industry average in most years. In fact, *B*urroughs, Sperry-*U*nivac, *N*CR, *C*DC, and *H*oneywell, are unglamorously called the BUNCH by some industry analysts (Magnet, 1984).

Summary

The empirical evidence from the computer industry suggests that conventional referents of performance, whether they be measures of profitability, like ROS, ROE and ROTC, or financial market measures, like the M/B ratio, are unsatisfactory discriminants of 'excellence'.

Perhaps this should not come as a surprise, since the above measures of performance have at least three major limitations: (1) they assume that a single performance criterion can assess 'excellence', (2) they focus only on outcomes to the exclusion of transformation processes within the firm, and (3) they ignore the claims of other stakeholders besides the stockholder. Other perspectives on measuring strategic performance that overcome these limitations will be discussed in the next section.

Composite measures of performance

Several recent studies have pointed out that instead of searching for that single measure which most significantly determines performance, a multi-factor model of performance assessment should be used (Bagozzi and Phillips, 1982; Benson, 1974; Keats, 1983). Their argument is based on the fact that 'excellence' is a complex phenomenon requiring more than a single criterion to define it.

One of the better known multi-factor models of performance is the bankruptcy model (Altman, 1971; Argenti, 1976). These researchers found, through a careful study of several corporate bankruptcies, that a multiple discriminant function called the Z factor had very good predictive powers for determining corporate bankruptcies, especially close to the actual event. Z was defined as

$$0.012\,X1 + 0.014\,X2 + 0.033\,X3 + 0.006\,X4 + 0.010\,X5$$

where $X1$ is working capital/total assets,
$X2$ is the retained earnings/total assets,
$X3$ is the earnings before interest and taxes/total assets,
$X4$ is the market value of equity/book value of total debt, and
$X5$ is sales/total assets.

The prescription, offered by these studies based on an empirical analysis of bankrupt and healthy companies is simple:

> You work out these five ratios for your company, multiply each by its own constant, add them up, and arrive at Z, the figure which shows if your company is going bust. If Z is less than 1.8 you are almost certain to go bust, if it is more than 3.0 you almost certainly will not (Argenti, 1976: 57)

While the Z values were essentially constructed to predict bankruptcy (and even here, its success has been mixed), it can also be a valuable index of the company's overall well-being. The higher the Z value is beyond 3, the more healthy is the firm. By measuring distance from bankruptcy, Z factor could be a surrogate index of strategic performance. This measure is obviously flawed in that a well-managed firm does not focus all its energies only on staving off bankruptcy. Nevertheless, being the only multi-factor model of performance that has been extensively tested, the Z factor was included as one of the performance screens for this study. While very high Z scores may not account for much, scores lower than the threshold of 3 should be cause for concern.

The Z factors for the 14 companies (Table 7) do indeed show a more distinctive pattern than the profitability measures that were discussed earlier. The mean Z scores for 'excellent' companies like Data General, DEC, and Hewlett Packard were significantly higher (at 0.05 level of significance) than that for 'non-excellent' companies like Sperry, and Control Data (see Table 4). Four of the 'excellent' firms in the sample—IBM, Hewlett Packard, DEC, and Data General—did not experience a Z score of less than 3.0 even once in the 20-year period from 1964 to 1983. In contrast, Cray Research was the only 'non-excellent' firm to have such a clean record. In fact, four 'non-excellent' firms—Honeywell, Sperry, Control Data, and Burroughs, had Z scores of less than 3.0 in 7 or more years in the same 20-year period. However, the performance of NCR, an 'excellent' company, was equally

Table 7. *Z* Factor (1964–83)

Company	1964	1966	1970	1975	1977	1979	1980	1981	1982	1983	Number of years in which *Z* was ≤3.0 (unhealthy)	Number of years in which *Z* was ≤1.8 (bankrupt)
Excellent companies												
IBM	11.38	11.93	11.37	8.29	7.22	5.34	5.31	4.49	5.88	6.57	0	0
HP	12.18	10.44	10.13	11.65	7.14	6.44	7.65	7.14	9.13	9.46	0	0
DEC	—	8.58	11.62	8.56	6.07	5.04	5.35	6.66	6.93	5.14	0	0
NCR	3.93	3.94	2.25	2.19	2.87	3.34	3.19	2.91	3.61	4.12	8	1
Wang	—	—	14.95	2.96	3.67	5.26	5.70	5.21	6.04	6.33	2	0
Data General	—	—	23.82	10.35	5.05	4.39	4.12	3.82	3.27	3.80	0	0
Amdahl	—	—	—	—	6.00	3.47	5.13	4.13	2.82	3.70	1	0
Non-excellent companies												
Honeywell	5.31	3.90	2.42	2.17	2.89	3.26	3.44	2.89	2.97	3.19	8	0
Sperry	2.89	3.73	3.12	3.15	2.81	3.09	2.93	2.48	2.23	2.56	9	0
Control Data	5.04	1.94	1.74	1.59	2.06	2.60	3.04	2.94	1.41	1.19	7	7
Burroughs	2.08	3.65	2.93	3.67	4.17	3.97	2.52	2.18	2.56	2.96	7	0
Commodore	—	—	—	1.97	2.86	4.14	8.83	6.55	7.94	4.38	3	0
Prime Computer	—	—	—	3.08	4.88	4.65	9.36	6.12	9.69	7.08	0	1
Cray Research	—	—	—	—	8.21	12.55	18.64	11.18	7.56	7.87	0	0

Source: Compustat Data Base.

disappointing on this performance measure—*Z* scores below 3.0 in 9 of the 20 years. Its *Z* scores were also significantly lower than that of three other 'excellent' companies—Hewlett Packard, Data General, and DEC.

Impressive as this criterion is in discriminating 'excellence' (NCR being the only exception), the linear discriminant function *Z* is more of an empirical artifact than a performance vector anchored in theory. An 'excellent' firm must not merely focus on short-term outputs to avoid bankruptcy, but it must also ensure its long-term survival. In other words a good *Z* score may be a necessary condition for 'excellence' but not a sufficient one.

Satisfying multiple stakeholders.

The performance measures discussed so far were solely focused on the welfare of the stockholder. A truly 'excellent' firm must also balance the competing claims of its various other stakeholders, in order to ensure their continuing cooperation (Barnard, 1938). The profit performance of a firm, and the strategies that it pursues, can often be interpreted differently by the firm's multiple stakeholders. Investors in a firm may welcome, for example, the firm's shift to robotics in its manufacturing plans, while the workers' union may find the option objectionable. The community at large may be apprehensive of the option's impact on the local economy. The increasing power of various stakeholder groups and their multiple, contradictory and often changing preferences (Freeman, 1984), confounds the problem of ensuring their satisfaction. As Kimberly, Norling and Weiss point out:

> Traditional perspectives on performance tend to ignore the fact that organizations also perform in other, less observable arenas. Their performance in these arenas may in some cases be more powerful shapers of future possibilities than how they measure up on traditional criteria. And, paradoxically competence in the less

observable arenas may be interpreted as incompetence by those whose judgements are based solely on traditional criteria. Particularly in the case of organizations serving the interests of more than one group where power is not highly skewed and orientations diverge, the ability to develop and maintain a variety of relationships in the context of diverse and perhaps contradictory pressure is critical yet not necessarily visible to the external observer (1983: 257, 258).

All the measures of performance discussed so far have to do directly or indirectly with maximizing stockholder wealth. Creating stockholder value need not always converge with the interests of other stakeholders. Top management goals, for example, can at times be at odds with such an objective (Donaldson and Lorsch, 1983). Getting the involvement of the firm's employees may detract from profit maximization but may be crucial to the long-term viability of the firm (Abernathy, Clark and Kantrow, 1983; Lawrence and Dyer, 1983). Maximizing stockholder wealth should not then be the sole guiding principle of 'excellent' companies. A necessary condition for excellence is the continued cooperation of the firm's multiple stakeholders. Minimizing their dissatisfaction should be a concurrent objective of 'excellent' companies.

In the *Fortune* survey of corporate reputations cited earlier (Table 1), the respondents were asked to rank the reputation of firms (other than their own) on a scale of 0 = poor to 10 = excellent on eight key attributes. These attributes covered the stakes of several stakeholders, including: (1) stockholder—financial soundness, use of corporate assets, quality of management and long-term investment value; (2) customers—quality of products or services and innovativeness; (3) employees—ability to attract, develop and keep talented people; (4) community—community and environmental responsibility. Firms that appealed to multiple stakeholders were th ones that had the highest reputation (Table 8).

Table 8. Stakeholder satisfaction reputation scores (1983)

	Stakeholders								
	Stockholders				Customers		Employees	Community	Overall
Company	Quality of management (1)	Value as a long-term investment (2)	Financial soundness (3)	Use of assets (4)	Quality of products (5)	Innova-tiveness (6)	Ability to attract and keep (7)	Social responsibility (8)	
Excellent companies									
IBM	9.16	8.88	9.45	8.47	8.40	7.51	8.39	7.95	8.53
HP	8.75	8.08	8.41	8.01	8.56	8.04	8.42	7.56	8.24
DEC	7.42	7.21	7.52	6.97	7.74	7.08	7.17	6.79	7.24
NCR	6.53	6.07	6.68	6.51	6.22	5.80	5.76	6.44	6.29
Wang	7.61	6.88	6.83	7.18	7.54	7.67	7.27	6.73	7.22
Non-excellent companies									
Honeywell	5.80	5.34	6.20	6.03	6.14	4.94	5.47	6.51	5.79
Sperry	5.22	4.68	5.15	5.08	5.63	4.78	4.90	5.91	5.16
Control Data	6.08	5.31	5.80	5.59	6.22	5.83	5.67	7.39	5.98
Burroughs	5.21	4.40	5.26	5.16	5.57	4.51	4.65	5.64	5.04

Source: *Fortune* magazine survey records.

IBM, for example, was rated highly for its appeal to stockholders, employees and various public interest groups. Hewlett Packard was rated highly for its appeal to stockholders and employees. Despite the poor financial performance of NCR, it had a better reputation than the other 'non-excellent' firms in the sample because of its superior ability to ensure the satisfaction of its customers, employees, and host communities. While more sophisticated surveys of stakeholder satisfaction are being attempted, the rudimentary survey done by *Fortune* points nevertheless to the need to look beyond performance measures that address only the concerns of stockholders.

Measuring the quality of a firm's transformation

While multi-factor measures of the firm's short-term viability, like the *Z* factor, or measures of satisfaction of the firm's stakeholders define the necessary conditions that an 'excellent' firm must fulfill, they ignore the ability of the firm to transform itself to meet future challenges. Performance measures that help evaluate the quality of a firm's transformations are the true discriminators of 'excellence' (Evan, 1976).

The transformation processes pursued by a firm can be classified into two broad categories: adaptive specialization and adaptive generalization (Chakravarthy, 1982). Adaptive specialization is the process of improving the goodness of fit in a given state of adaptation. In other words the emphasis is predominantly on profitably exploiting the firm's current environment, and generating a net surplus of contributions over the inducements paid to the various stakeholders of the firm for their cooperation (Barnard, 1938). The performance measures discussed in the earlier sections are useful for monitoring the quality of a firm's adaptive specialization. Adaptive generalization, on the other hand, is concerned with the investment of the firm's net surplus of 'slack' resources (Cyert and March, 1963) for improving its ability to adapt to uncertain or even unknown future environments.

While adaptive generalization is a must for the firm to ensure its long-term survival, its pursuit can detract from short-term profitability (Chakravarthy, 1981). For example, a firm investing heavily in R&D expenditures to avoid technological obsolescence may show a lower profitability than a rival not as committed to its R&D investment. The former's profitability is understated because a substantial portion of its 'current expenses' are in fact incurred to create 'future options' (Vancil, 1972). However, there are clear limits below which the firm's short-term profit performance cannot be allowed to slip. The *Z* factor discussed earlier defines one such threshold. While it may sometimes be necessary for a firm to keep bouncing off its long-term and short-term survival thresholds, a well-managed firm should be able to steer a middle course (Chakravarthy and Lorange, 1984). Such a firm makes steady investments of slack to generate future options, while replenishing the invested slack resources on a regular basis. It pursues adaptive generalization and specialization concurrently.

Generation of slack can often be quantified through financial measures; however, evaluating how well a firm has invested its slack is more difficult. Slack can be invested, for example, in managerial or technical capabilities (Miles, 1982). It can also be used to expand the organizational capabilities of a firm (Christenson, 1973), or to reduce its resource dependencies (Lawrence and Dyer, 1983). The computation of option values in all of the above cases is problematic. Conventional financial techniques can miss them since options can often come 'dressed in non-financial clothes' (Myers, 1984).

Moreover, even where investment of slack has been measured it has typically been based on 'unobtrusive', publicly available data (Bourgeois, 1981). Managers are not only reluctant

to disclose the true value of the options they hold for fear of hurting their firm's competitive posture, they are also not very effective in communicating this value to the public, even when they have tried (Bettis, 1983). The firm's strategic options may also be 'hidden' to avoid bringing the slack that is invested in them to the attention of the firm's stakeholders. Managers fear that an advertisement of the firm's surplus may lead to a bargaining for its disbursement with the firm's stakeholders. Consequently, an empirical assessment of the quality of a firm's adaptive generalization is difficult.

Despite the above limitations, this study uses a few of the publicly reported financial measures for evaluating the manner in which a firm has managed its slack resources. The purpose of such an analysis is to explore whether there is prima facie support for the hypothesis that 'excellent' firms manage their slack resources better than 'non-excellent' firms.

Profitability is an obvious determinant of a firm's slack resources. This study uses cashflow by investment ratio as a measure of profitability. The higher the ratio, the higher is the slack available to the firm in any given period. It is to be noted that other commonly used measures of profitability, for example, return on sales ($\rho = 0.67$), return on total capital ($\rho = 0.72$), return on book equity ($\rho = 0.63$), and net income by total assets ($\rho = 0.72$), were highly correlated in our sample with this measure.

Productivity is another important measure of a firm's ability to generate slack. Sales revenue per employee is a crude measure of the firm's labor productivity, and the firm's sales revenue per dollar of total assets is a measure of its capital productivity. Increases in these ratios indicate an increase in the slack resources generated by the firm. As will be shown later, profitability and productivity need not be correlated. The former is a surplus contribution (over inducements) received by the firm from its customers, the latter is a surplus it receives from its employees.

The ability of the firm to raise long-term capital resources is yet another measure of the slack available to it. Two popular measures of this ability are its market to book ratio and its debt to equity ratio (Bourgeois, 1981). As the former increases, the ability of the firm to venture into the stock market for additional equity capital improves. Conversely, as the firm's debt to equity ratio decreases, its ability to raise additional loan capital improves.

Profitability, productivity and the ability to raise long-term resources form the core measures in this study of the slack resources available to a firm. Three other measures that refer to the use of slack will be discussed next.

A popular measure of a firm's investment in its future is the percentage of its sales revenues that it allocates to R&D expenses (Old, 1982). Other uses of the firm's slack resources are abnormal increases in its fixed and working capital expenditures (Bourgeois, 1981), as measured by increases in the capital expenditure to sales ratio and working capital to sales ratio. Sales to total assets was used in this study in lieu of capital expenditures to sales. Not only are the two variables highly correlated (correlation coefficient $= -0.68$) in the current sample, sales to total assets also seems to be a better measure of abnormal increases in a firm's capital expenditures. The ratio of capital expenditures to sales may experience wilder swings than the ratio of sales to total assets because of the lumpiness in a firm's investments. Dividend payout ratio was used as a third measure of slack usage (Bourgeois, 1981). The higher this ratio, the lower are the earnings retained by the firm for investments in its future.

To summarize, the eight slack variables selected for the study were: Cashflow/Investment ratio (CFBYIN), Sales by Total Assets (SABYTA), R&D by Sales ratio (RDBYSA), Market to Book value (MBYB), Sales per Employee (SABYEM), Debt by Equity ratio (DTBYEQ),

Working capital by sales ratio (WCBYSA), and Dividend Payout ratio (DIVPAY). The correlation in the sample between these variables was very low (see Table 9).

Since the norms for these ratios vary from industry to industry, the ratios were all standardized using the mean and variances in these ratios each year across the 14 companies in the sample (assumed to represent the entire industry). Furthermore, to allow for a comparison of slack measures from year to year, each year's mean was set to zero and standard deviation was scaled to 1. Thus, the standardized values for the eight slack variables represent the number of standard deviations from industry mean in any given year.

A cluster analysis was performed on the eight standardized variables to discern commonalities in them across the 215 usable sets of observations in the sample. Ideally, there should have been 14 (companies) × 20 (years) or 280 sets of observations. However,

Table 9. Oblique principal component cluster analysis
215 sets of observations: Proportion = 0,000000
8 variables: Maxeigen = 1000

Correlations

	CFBYIN	SABYTA	RDBYSA	MBYB	SABYEM	DTBYEQ	WCBYSA	DIVPAY
CFBYIN	1.00							
SABYTA	0.20	1.00						
RDBYSA	0.10	−0.03	1.00					
MBYB	0.41	0.14	0.41	1.00				
SABYEM	0.49	0.11	0.20	0.36				
DIBYEQ	−0.36	−0.29	−0.36	−0.22	−0.29	1.00		
WCBYSA	−0.21	−0.29	0.38	0.36	−1.00	0.01	1.00	
DIVPAY	0.22	−0.11	−0.24	−0.29	0.03	−0.05	−0.45	1.00

Cluster summary for two clusters

Cluster	Members	Cluster Variation	Variation Explained	Proportion Explained	Second Eigenvalue
1	5	5.000000	2.193827	0.4388	0.995099
2	3	3.000000	1.717970	0.5727	0.764980

Total variation explained = 3.911797; Proportion = 0.488975

R-squared with

	Variable	Own cluster	Next Highest	R^2 ratio	Standardized Scoring Coefficient
Cluster 1	CFBYIN	0.6287	0.0245	0.0389	0.36
	SABYTA	0.1894	0.0114	0.0602	0.36
	MBYB	0.4359	0.2169	0.4977	0.20
	SABYEM	0.5203	0.0003	0.0005	0.30
	DTBYEQ	0.4195	0.1430	0.0341	−0.30
Cluster 2	RDBYSA	0.4766	0.1054	0.2213	0.40
	WCBYSA	0.6881	0.0039	0.0057	0.48
	DIVPAY	0.5533	0.0000	0.0001	−0.43

because some of the companies in the sample were less than 20 years old, and a few observation sets were incomplete (observations unavailable on all eight variables), only 215 sets of observation sets were available for analysis. Two clusters were obtained (Table 9). The first comprising Cashflow/Investment ratio, Sales per Employee, Sales by Total Assets, Market to Book value, and Debt by Equity ratio are variables that are *sources* of slack. Cashflow/Investment ratio is a measure of the firm's ability to generate cash in the short run. The next two measures, Sales per Employee and Sales by Total Assets, indicate the labor and capital productivity of the firm, respectively. Market to Book value reflects the firm's ability to raise equity capital, and Debt by Equity ratio measures the firm's ability to raise loan capital. While increases in the first four ratios beyond industry averages imply more slack generated by the focal firm, the Debt by Equity ratio must drop below industry average for it to represent a source of slack for the firm. The negative sign associated with the scoring coefficient for this variable (Table 9) was, therefore, reassuring.

The second cluster includes three variables all of which are *uses* of slack. R&D by sales ratio measures the firm's investment in research and development. Working Capital by Sales ratio indicates the slack resources invested in working capital. Dividend Payout ratio is the percentage of earnings that the firm pays out as dividends. The negative coefficient associated with Dividend Payout ratio (Table 9) may be due to two reasons: (1) high working capital needs forces a firm to conserve its earnings, resulting in a low Dividend Payout ratio, and (2) high R&D by Sales ratio may indicate that a firm is focusing on growth and reinvestment and therefore has a low Dividend Payout ratio. Table 10 compares the differences between 'excellent' and 'non-excellent' firms on the eight slack variables.

'Excellent' firms consistently generated more slack than 'non-excellent' firms as measured on four of the five ratios representing slack generation. On Sales by Total Assets,

Table 10. Comparing excellent and non-excellent firms on multiple attributes

Performance measure	Excellent firms		Non-excellent firms	
	Mean no. of S.D. above industry average[a]	S.D.	Mean no. of S.D. above industry average[a]	S.D.
Generation of slack				
1. CFBYIN[b]	0.18	0.91	−0.23	0.84
2. SABYEM	0.04	1.13	−0.09	0.78
3. SABYTA	−0.10	0.53	−0.40	0.90
4. MBYB[b]	0.23	0.91	−0.40	0.86
5. DYBYEQ[b]	−0.35	0.83	0.27	0.90
Investment of slack				
6. RDBYSA[b]	0.40	0.90	−0.04	0.74
7. WCBYSA[b]	0.24	0.91	−0.21	1.05
8. DIVPAY	0.14	1.06	0.12	0.89

[a]Data for each year were standardized setting industry mean = 0 and S.D. = 1. The observations for each company, therefore, represent number of standard deviations above (+) or below (−) the industry mean. The next column shows in turn the standard deviation of these.

[b]Mean values on these ratios were significantly different for excellent companies from those for non-excellent companies (0.95 confidence level using *t*-tests).

however, 'non-excellent' firms on an average scored higher than 'excellent' firms (though not statistically significant at a 0.95 confidence level). This is because of the high negative correlation (−0.68) that Sales by Total Assets has with the capital expenditure by sales ratio. A lower Sales by Total Assets for 'excellent' firms implies that on an average they invested more in their fixed assets when compared to 'non-excellent' firms. This is consistent with their commitment to future growth.

Interestingly, there was also no statistically significant (0.95 confidence level) difference between the productivities of the two classes of firms, as measured by their Sales by Employee ratio. This may in part be explained by the greater number of sales and service employees engaged by 'excellent' firms in the computer industry to maintain close links with their customers (Peters and Waterman, 1982).

On slack usage, 'excellent' firms showed significantly higher investments than 'non-excellent' firms in research and development, as expected. There was surprisingly no significant difference between the dividend policies of 'excellent' and 'non-excellent' firms (Table 11). In both categories there are firms that have paid no dividends from 1964 through 1983, and there are others that have paid over a third of their earnings as dividends. 'Excellent' firms also seem to have tied up more resources in working capital. It is difficult to evaluate the strategic significance of this finding without a more thorough analysis of each firm's strategy. For companies like IBM, Amdahl and Data General, this may solely be due to the higher cash reserves that they carry (Table 11). The low inventory turnover at IBM may also reflect its strategy of selling direct to its customers. As to why Honeywell, Sperry, Control Data, and Commodore turned their inventories faster than most of their 'excellent' competitors, there is no obvious explanation.

A discriminant function constructed with the eight variables discussed here successfully distinguished the companies in the sample in 73 percent of the cases (see Table 12). The discriminant function obtained was:

$$0.12\ \text{CFBYIN} - 0.19\ \text{SABYEM} - 0.10\ \text{SABYTA} + 0.12\ \text{MBYB} - 0.28\ \text{DTBYEQ} + 0.34\ \text{RDBYSA} + 0.19\ \text{WCBYSA} + 0.29\ \text{DIVPAY} >= 0.14 \text{ for 'excellence'}$$

The discriminant function was strongly supportive of the 'excellence' of Hewlett Packard, DEC, Amdahl, and Data General. Similarly, it was able to discern the 'non-excellence' of Sperry, Control Data, and Commodore.

The real value of the discriminant function, however, is not in its ability to correctly classify 'excellent' and 'non-excellent' firms. A measure like the *Z* factor, for example, yielded comparable results. But unlike the *Z* factor or other naive performance measures discussed earlier, the discriminant function has a better theoretical rationale. Its variables are measures of a firm's slack sources and uses. It is through the management of these and other slack variables that a firm can ensure its long-term survival. The contribution of this study is in showing that 'slack' variables are important discriminators of strategic performance.

CONCLUSIONS

This study sought to identify key measures of performance that are associated with 'excellent' firms. Table 13 recapitulates some of the important measures that were discussed. No single profitability measure seems capable of discriminating excellence. Moreover, accounting data that are typically used to construct these measures capture past performance or historical trends. Strategic performance needs a more futuristic measure.

Table 11. Investment of slack: Mean values of key ratios (1964–83, where available)

	Working capital by sales	Accounts receivables by sales	Inventory by cost of goods sold	Cash by working capital	Earnings per share	Dividend payout (%)
Excellent companies						
IBM	0.23	0.06	0.68	0.89	10.89	48.32
HP	0.30	0.22	0.46	0.21	2.39	11.40
DEC	0.53	0.31	0.57	0.20	3.40	—
NCR	0.32	0.27	0.52	0.24	4.76	20.00
Wang	0.41	0.31	0.69	0.10	1.21	4.04
Data General	0.61	0.28	0.53	0.48	2.43	—
Amdahl	0.37	0.23	0.44	0.50	2.09	33.41
Non-excellent companies						
Honeywell	0.21	0.19	0.34	0.29	6.38	31.75
Sperry	0.23	0.28	0.32	0.11	3.55	23.35
Control Data	0.30	0.34	0.49	0.09	3.44	3.21
Burroughs	0.31	0.35	0.66	0.12	4.17	37.58
Commodore	0.19	0.33	0.31	0.23	2.10	—
Prime Computers	0.45	0.19	0.89	0.12	1.14	—
Cray Research	0.64	0.47	0.56	0.30	1.36	—

Source: Compustat Data Base.

Table 12. The power of the discriminant function to distinguish excellence

	As classified by discriminant function		
As classified by Peters and Waterman	Excellent	Non-excellent	Total no. of observations
Excellent	93	23	116
Non-excellent	35	64	99
Total	128	87	215

Summary table of misclassification

	Excellent firms				Non-excellent firms		
	Name	No. of years in which misclassified	Percentage of years misclassified		Name	No. of years in which misclassified	Percentage of years misclassified
1.	Wang	7	41	1.	Cray Research	7	100
2.	NCR	8	40	2.	Prime	8	89
3.	IBM	7	35	3.	Honeywell	8	40
4.	Amdahl	1	12	4.	Burroughs	7	35
		23		5.	CDC	2	10
				6.	Sperry	2	10
				7.	Commodore	1	5
						35	

Note: Overall misclassification 58 out of 215 or 27 percent.

Table 13. Performance profile of the sample firms

Company	Performance attribute: Stakeholder satisfaction (overall score) 1984	Financial performance (mean 1964–83): Profitability Z score	M/B	Debt/ equity	Future options (mean 1964–83): R/D sales
Excellent companies					
IBM	8.44	9.40	4.72	0.09	0.04
HP	8.08	10.90	4.86	0.01	0.10
DEC	6.86	13.45	7.29	0.09	0.09
NCR	6.07	2.99	1.54	0.49	0.04
Wang	7.07	9.75	10.03	0.42	0.04
Data Control	—	11.04	4.27	0.17	0.10
Amdahl	—	4.79	2.87	0.15	0.13
Non-excellent companies					
Honeywell	5.78	3.41	2.18	0.32	0.04
Sperry	5.00	3.20	1.39	0.33	0.05
Control Data	5.50	2.55	2.26	0.56	0.04
Burroughs	5.33	3.69	2.98	0.35	0.05
Commodore	—	4.58	5.00	0.36	0.04
Prime	—	5.54	5.36	0.77	0.08
Cray Research	—	11.02	5.46	0.16	0.16

While Market by Book value or more sophisticated financial-market based measures of performance can alleviate the above problem, financial market may experience difficulties and delays in fully comprehending the ability to adapt to future environments that managers of 'excellent' companies continuously nurture with their slack resources. At any rate M/B ratio was a poor discriminator of 'excellence' in this study.

Moreover, the preponderant attention in the performance literature to maximizing stockholder wealth needs to be tempered with a concern for other stakeholders of the firm. The role of top management is to ensure the continued cooperation of all stakeholders by providing them at least minimal satisfaction (Barnard, 1938). This would suggest that 'excellence' is not reflected in the maximization of performance along any single dimension, but rather in the ability of the firm to simultaneously maintain several performance parameters within safe limits (Ashby, 1971).

Financial criteria such as ROI, ROE, M/B ratio or the Z factor define one set of necessary conditions for 'excellence'. An 'excellent' company's financial performance should be above average for the industry, and definitely above any bankruptcy threshold (e.g. $Z > 3$). The satisfaction of the firm's key stakeholders defines the other set of necessary conditions. Exemplar companies like IBM and Hewlett Packard did not excel on many of the performance screens that were used in this study. For example, their mean Z score and M/B ratio were lower than that of other firms in the sample (Table 13). But they performed at or above industry average on all criteria, and they were also adept at keeping their multiple stakeholders satisfied (Table 8).

While the criteria discussed above are necessary conditions for excellence, they are not sufficient. A firm is excellent only if it has in addition, the ability to transform itself in response to changes in its environment. The attempt made in this study to operationalize the adaptive ability of a firm by measuring the slack resources generated and invested by it was

admittedly rudimentary. However, it is clear that a firm needs slack resources to ensure its flexibility in the future. 'Excellent' firms in our sample were able to generate more slack resources than 'non-excellent' firms (Table 10). The former group also invested a significantly higher proportion of their revenues in research and development (Table 10). This is in keeping with their propensity to invest in options for the future.

A limitation of this study is that it merely examined how a firm had chosen to invest its slack. And yet it is the value of future options that an 'excellent' firm accumulates through current investment of slack that really distinguishes it from the rest of its competitors. For example, higher investment in R&D is no guarantee that it will generate new businesses in the future. Evaluating the economic worth of such an investment is difficult (Myers, 1984). Moreover, not all of the slack invested by a firm can be quantified.

Despite some of its failings, the study points nevertheless to the naivete of both researchers and managers in relying solely on financial outcomes such as ROI or Market/Book ratio for measuring a firm's strategic performance. Maximizing performance on these measures does not guarantee excellence, and on occasion may even detract from it. The firm may have alienated its stakeholders in order to satisfy its stockholders, or may have compromised its ability to adapt to future environments.

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