A Note on the Dimensionality of the Firm Financial Performance Construct Using Accounting, Market, and Subjective Measures

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Abstract
Most research in strategic management operationalizes firm financial performance by using either accounting- or market-based measures. Recently, some have suggested that subjective measures may be useful in assessing a firm's financial performance. We argue that there is a theoretical basis for viewing firm financial performance as having a higher order structure consisting of three separate yet distinct dimensions. Using second-order confirmatory factor analysis, we found that while differences exist among accounting, market, and subjective measures of firm financial performance, there is evidence to support the concept of a single underlying construct. While our findings are statistically significant and thus support our hypotheses, the substantive nature of our results suggests that much more research is needed before we fully understand the dimensionality of firm financial performance.

Résumé
Dans la majorité des recherches en gestion stratégique, on opérationnalise la performance financière d'une entreprise au moyen de mesures fondées sur la comptabilité ou le marché. Récemment, certains ont suggéré que des mesures subjectives pourraient être utiles dans l'évaluation de la performance financière d'une entreprise. Nous avançons l'hypothèse qu'il existe une base théorique pour considérer que la performance financière d'une entreprise consiste en une structure supérieure de trois dimensions séparées et distinctes. Par l'analyse des facteurs de confirmation secondaires, on a trouvé qu'il existe des différences dans les mesures de performance financière d'une entreprise, que ce soit la mesure de comptabilité, de marché ou subjective, et on peut prouver le concept d'une base unique commune. Bien qu'ils soient statistiquement significatifs et prouvent nos hypothèses, nos résultats suggèrent qu'il faut effectuer des recherches plus poussées avant de comprendre tout à fait la dimension de la performance financière d'une entreprise.

Some measure of firm performance is the overwhelmingly dominant dependent variable in strategic management research. Indeed, the very essence of strategic management is that the formulation and implementation of strategies can have a direct effect on firm performance. For example, Barney (1997) viewed strategy as patterns of resource allocations that enable a firm to improve or maintain its performance. Similarly, Bromily (1990) argued that strategy is the description of factors associated with superior performance. Finally, Schendel and Hofer (1979) suggested that firm performance is the time test of any strategy. Given the importance of the role played by performance in strategic management research, the correct operationalization of this construct is critical for the development of valid and reliable research. In this study, we explore one aspect of firm performance: firm financial performance.

When financial performance is operationalized, researchers generally use measures of either accounting performance or market performance to indicate a firm's level of financial performance. The dominance of these two views of firm financial performance in the strategic management literature has led to an implicit consensus

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that the financial performance construct has two dimensions: accounting performance and market performance. More recently, some scholars have begun to use subjective measures when operationalizing firm financial performance (Cannella & Hambrick, 1993; Dess & Robinson, 1984; Fryxell & Wang, 1994), a potential third dimension. This paper explores the dimensionality of the financial performance construct by examining the interrelationships among accounting, market, and subjective measures of firm financial performance.

Firm Financial Performance

Venkatraman and Ramanujam (1986) noted that firm performance, as defined in the narrowest terms of the construct, "centers on the use of simple outcome-based financial indicators that are assumed to reflect the fulfillment of the economic goals of the firm" (p. 803). They referred to this narrow portion of the performance construct as financial performance and argued that it has been the dominant model for empirical strategic management researchers. They noted that researchers typically operationalize the financial performance construct in terms of some accounting ratio (e.g., ROA, ROS, ROE, ROI) or market-based measure (e.g., Sharpe, Treynor, Jensen's alpha, Tobin's *q*). Finally, as we have noted, some researchers have operationalized the financial performance construct using the subjective view of informed respondents (e.g., Cannella & Hambrick, 1993; Dess & Robinson, 1984; Fryxell & Wang, 1994).

Venkatraman and Ramanujam (1986) argued that whatever means is used to operationalize a firm's financial performance, "this approach remains very much financial in its orientation and assumes the dominance and legitimacy of financial goals in a firm's system of goals" (p. 804). However, it remains unclear whether accounting, market, and subjective measures of a firm's financial performance are simply three different methods of operationalizing the construct (suggesting that the firm financial performance construct is unidimensional, which Venkatraman and Ramanujam implied), or whether these three methods represent distinct dimensions of firm financial performance, suggesting that the construct may be multidimensional. This paper seeks to explore these issues.

Accounting-Based Measures of Financial Performance

Accounting-based measures of firm financial performance are the most popular in the strategic management literature (Barney, 1997). While cynics would suggest that the reason for the popularity of accounting measures is that the data are easily available for publicly traded firms, others contend that accounting numbers are important because managers use them when making strategic decisions, and because they actually provide insights into economic rates of return (Horowitz, 1984; Jacobson, 1987; Long & Ravenscraft, 1984). However, others have criticized them because accounting numbers have a built in short-term bias, are subject to manipulation by managers, and undervalue intangible assets (Bentson, 1982; Fisher & McGowan, 1983; Watts & Zimmerman, 1978, 1990).

Usually, measures of accounting performance are used if the effects of the independent variables (strategy formulation and implementation) on the dependent variable (firm financial performance) are expected to occur in the current period. In other words, from a theoretical perspective, accounting measures are believed to assess a firm's short-term performance, reflect historical information, and be retrospective in their temporal scope. For example, research in the area of retrenchment relies on the use of accounting measures of performance (Hambrick & Schecter, 1983; Pearce & Robbins, 1993). Retrenchment (the reduction of unnecessary costs and the elimination of unproductive assets) is a widely used business-level turnaround strategy for improving short-term performance. This suggests that accounting measures of performance are most appropriate, particularly in light of recent evidence that the effects of retrenchment are not long lasting (Morrow, Busenitz, & Johnson, 1997).

Market-Based Measures of Financial Performance

While early empirical work in strategic management relied almost exclusively on accounting measures of performance, in recent years strategy researchers have begun to rely on market-based measures of performance, either alone or in conjunction with accounting-based measures, when assessing a firm's financial performance (Hoskisson, Hitt, Johnson, & Moesel, 1993; Hoskisson, Johnson, & Moesel, 1994). This increased use of market-based measures of firm performance may be a response in part to the increased availability of micro-computers, which made it easier to calculate many of the market-based measures, and in part to criticisms of accounting-based measures (Bentson, 1982; Fisher & McGowan, 1983; Watts & Zimmerman, 1978, 1990).

However, the theoretical basis for using market-based performance measures is that they reflect a firm's financial performance more accurately than do accounting-based measures. For example, Seth (1990) suggested that market-based measures are intrinsically different from accounting-based measures because market-based

measures focus on the present value of future streams of income, (e. g., on the expected value of future cash flows), whereas accounting-based measures focus on past performance. This suggests that if the independent variable(s) are believed to have an effect on the dependent variable in the long run (e. g., occur in the current and future periods), market measures of financial performance are most appropriate, because they reflect the consensus of the market's overall estimates of the firm's potential to create shareholder value. Furthermore, market measures are thought to be immune to the distortions introduced by deceptive managerial practices and/or accounting conventions, under the assumption that efficient markets can see through such distortions. Empirical research on corporate restructuring is an example of the appropriate use of market-based measures of performance (Hoskisson et al., 1994; Hoskisson & Johnson, 1992). Unlike the earlier example of retrenchment, restructuring involves a major reorganization of the businesses that make up a corporation's portfolio. Corporate restructuring is believed to affect the long-run value of the company, not just its short-run accounting returns.

However, Hoskisson et al. (1994) suggested that past performance (measured using accounting data) is a good predictor of future performance (measured using market data). They found a significant, positive relationship between accounting- and market-based measures of financial performance, which is consistent with the findings of others (Hoskisson et al., 1993; Jacobson, 1987). Thus, while the two measures may be theoretically distinct, empirically they appear to be quite similar. This suggests that they may be separate dimensions of a single underlying construct (firm financial performance).

Subjective Measures of Financial Performance

While most researchers measure firm financial performance using either accounting or market measures, some have argued that subjective measures may also be useful in assessing a firm's financial performance. Dess and Robinson (1984) noted that subjective measures of firm financial performance may be useful if objective measures, such as those provided by accounting and market data, are not available. Dess and Robinson obtained their subjective performance measures from members of an organization's top management team, who were asked to subjectively rate their firm's performance. More recently, Cannella and Hambrick (1993) used firm executives and securities analysts to subjectively assess pre- and postacquisition performance in a study of executive succession in acquired firms. Another subjective measure of firm performance is the annual *Fortune* reputation survey. This survey asks industry experts and executives to rate the largest firms in their industry on what *Fortune* argues is a measure of a corporation's reputation. However, several recent studies (Cannella & Rowe, 1994; Fombrun & Shanley, 1990; Fryxell & Wang, 1994) suggest that the overall rating is actually a subjective measure of a firm's financial performance rather than a measure of its reputation.

It seems clear that accounting and market measures of performance are theoretically distinct both in their temporal scope and with respect to the primary stakeholder whose interests they represent. Accounting measures reflect the perspective of managers, who are interested in the performance of the firm over the most recent period. In contrast, market measures reflect the perspective of shareholders and potential investors, who are interested in the long-term financial performance of the firm. This is consistent with the view of agency theorists (Jensen & Meckling, 1976), who argue that these two primary stakeholders–managers, and shareholders and potential investors–have divergent interests.

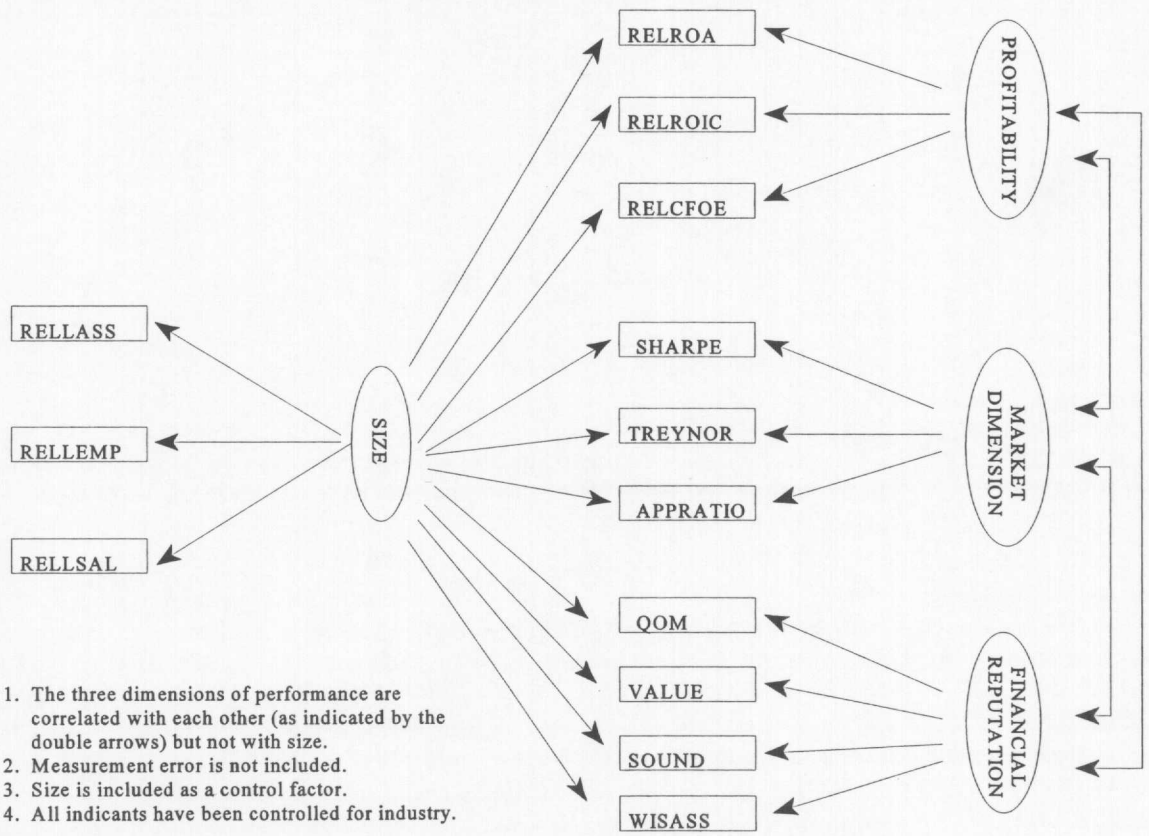
Subjective measures of a firm's financial performance seem to be theoretically distinct from both accounting and market-based measures in that subjective measures have no specific temporal perspective, because one may obtain retrospective and/or prospective subjective assessments of a firm's performance. Further, it is not clear what stakeholder group's interests are represented by the subjective assessment, although intuitively one might argue that it depends on the group membership of the individual giving the assessment. In this sense, subjective measures could represent the views of stakeholders other than managers and shareholders. While few studies have relied on subjective measures of a firm's financial performance, research does suggest that they may be valid indicators of a firm's financial performance, especially when objective measures are unavailable (e.g., in the case of private firms, not-for-profit organizations, and strategic business units of public firms).

The Dimensionality of Financial Performance

As the above discussion indicates, research in strategic management has treated firm financial performance as a multidimensional construct, with accounting, market, and subjective measures all providing distinctive measures. Therefore, we argue that:

> Hypothesis 1A: Multiple indicators of performance will load on three dimensions of financial performance (accounting, market, and subjective), and these dimensions will significantly covary (see Figure 1).

Figure 1.
A First-Order Confirmatory Factor Analysis Model Using Three Dimensions of Firm Financial Performance.



However, what has not yet been empirically explored in the strategic management literature is the possibility that accounting, market, and subjective measures of performance may be heavily dominated by a higher order factor that could be described as firm financial performance. Venkatraman and Ramanujam (1986) and Barney (1997) argued that firm financial performance is a unidimensional construct that could be operationalized using either accounting- or market-based measures. In other words, the idea that accounting, market, and subjective measures of firm financial performance are distinct yet similar in that they provide insights into a firm's underlying financial performance seems to be consistent with some theoretical and empirical research in the strategic management literature (Barney, 1997; Cannella & Hambrick, 1993; Dess & Robinson, 1984; Hoskisson et al., 1993, 1994; Venkatraman & Ramanujam, 1986). On the other hand, while we have evidence that market-based, accounting-based, and subjective measures of performance covary, we have not yet explored the possibility that, at a deeper level, there is a hierarchical ordering to the concept of firm financial performance, which would represent a more parsimonious conceptualization of the firm financial performance construct. Figure 2 illustrates our proposed second-order model and suggests the following hypothesis:

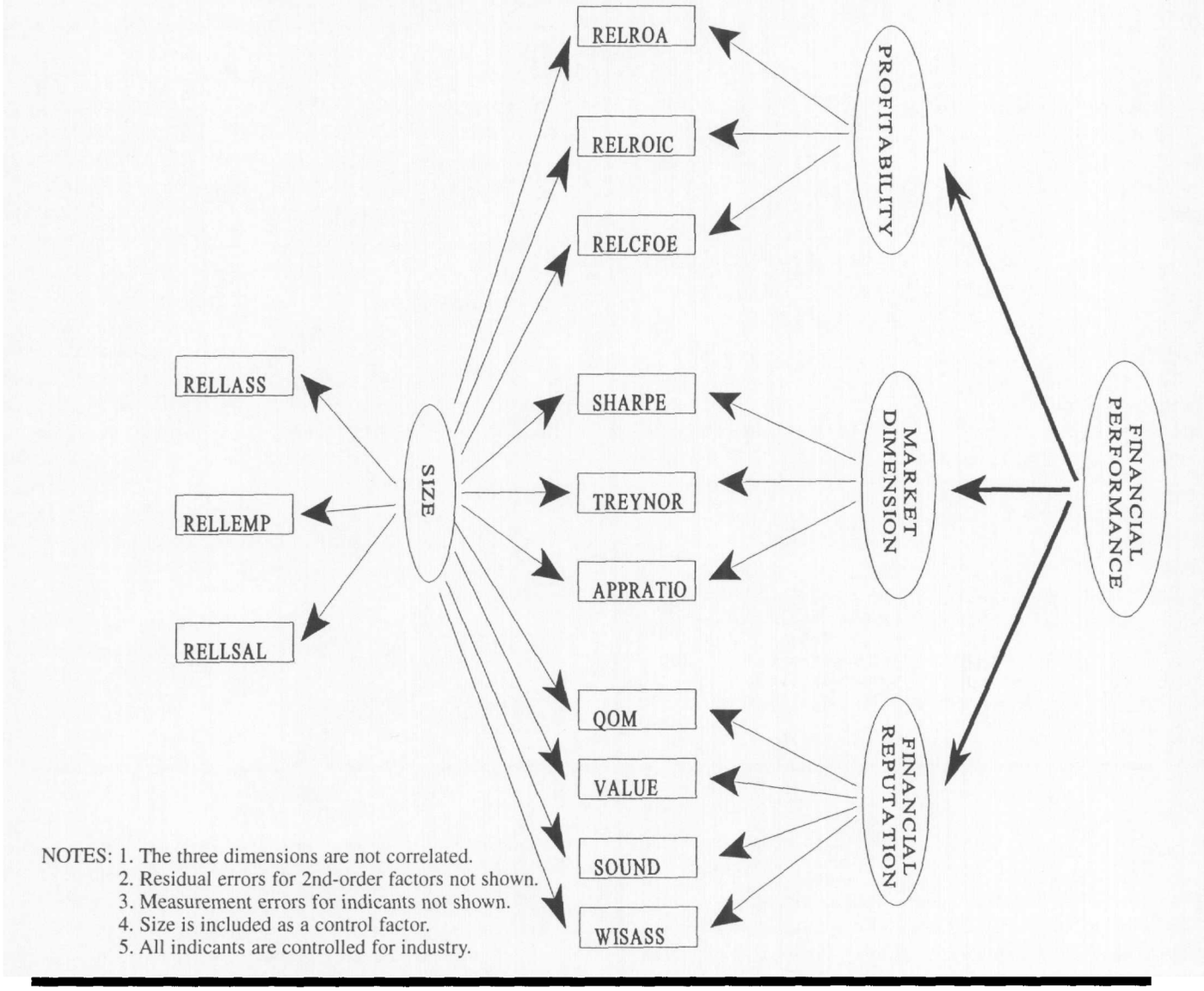
> Hypothesis 1B: The accounting, market, and subjective dimensions will be heavily influenced by an underlying concept of firm financial performance.

Methodology

Accounting Dimension

The accounting dimension is one of the more popular among strategy researchers. In this study, return on assets (ROA), return on invested capital (ROIC), and cash flow over equity (CFOE) were utilized. ROA and

Figure 2.
A Measurement Scheme for Financial Performance Using Second-Order Confirmatory Factor Analysis.



ROIC were measured by dividing income before extraordinary items (IBEI) at time *t* by net assets at time *t*-1 and invested capital (long-term debt plus shareholder's equity) at time *t*-1, respectively. It was expected that these two indicators of accounting performance would load heavily on the accounting dimension. This is consistent with empirical findings by several authors (Hoskisson et al., 1993, 1994; Keats, 1990), who found that accounting-based measures of performance load heavily on the accounting dimension of financial performance. CFOE was obtained by adding depreciation expense to IBEI in the numerator with both measured at time *t* and dividing the result by shareholder's equity at time *t*-1. It is expected that CFOE will load on the accounting dimension.

Market Dimension

Market performance was measured using three different indicators: the Sharpe measure, the Treynor measure, and the appraisal ratio. These three measures are commonly used to examine firm financial performance in equity markets (Alexander & Francis, 1986; Bodie, Kane, & Marcus, 1993; Hoskisson et al., 1994). In this

study, weekly stock returns (R_i) minus the weekly risk-free rate (RFR) were regressed on weekly market returns (R_m) minus the weekly risk-free rate (RFR):

$$R_i - RFR = \alpha + \beta (R_m - RFR) + e \quad (1)$$

The Sharpe and Treynor measures were calculated as follows: Sharpe's measure = $(R_i - RFR)/SE_i$ and Treynor's measure = $(R_i - RFR)/\beta_i$, where SEi is the total variance in a firm's weekly returns for the current year, β_i is the firm's stock price variance relative to market variance for all stocks listed on the same exchange as a firm's stock and is derived from Equation 1, R_i is the geometric mean of the weekly stock returns for the current year, and RFR is the geometric mean for the weekly risk-free rate for the current year. The Sharpe measure assesses the reward to total risk trade-off and the Treynor measure assesses the reward to systematic risk trade-off.

The appraisal ratio is Jensen's alpha/SE_e, where SE_e is the firm's unsystematic risk (residual variance from Equation 1). The appraisal ratio measures the abnormal return per unit of unsystematic risk that in principle could be totally diversified away. Jensen's alpha is the intercept from Equation 1 and measures the average return over and above that predicted by the CAPM model, given the firm's systematic risk (β) and the average market return. It is expected that, although these three measures use different risk measures to adjust returns, they will be positively correlated with each other and load heavily on the market performance dimension. This is consistent with empirical research conducted by Hoskisson et al. (1993, 1994).

Hoskisson et al. (1994) also found a positive significant relationship between the accounting and market performance dimensions. They noted that the degree to which accounting-based information appears to be immediately reflected in market performance was striking and probably very relevant for future research on firm financial performance. Furthermore, they suggested that the magnitude of the relationship was high enough to suggest that researchers who use market performance may have understated "the degree to which investors rely upon rapid response to accounting performance information released by firms in the same core industry as a focal firm in making their comparative investment evaluation" (p. 1242). We expected this dimension to be positively correlated with the accounting-based dimension, which is consistent with past research.

Subjective Dimension

As noted earlier, subjective measures of firm financial performance have been recommended by Dess and Robinson (1984) and used by other authors (Cannella & Hambrick, 1993). In this study, we use the annual *Fortune* ratings to operationalize our subjective measures. The ratings are purported to measure eight dimensions of reputation. However, Fryxell and Wang (1994) argued that only four dimensions need to be used when analyzing financial performance. These four are quality of management (QOM), financial soundness (SOUND), value as a long-term investment (LTINV), and wise use of corporate assets (WISASS). They argued that these four delimit what Venkatraman and Ramanujam (1986) called the financial performance domain. They considered that the significant loadings achieved by the other dimensions are "strongly suggestive of a halo effect where evaluations of the financial prowess of a company are projected onto these other items" (Venkatraman & Ramanujam, p. 803). They concluded that the dominant factor underlying the *Fortune* ratings appears to be predominantly financial in nature, and that the *Fortune* data provides a good measure and "would simply create an index of the first four items in our model" (Fryxell & Wang, 1994, p. 11). Therefore, we selected quality of management (QOM), financial soundness (SOUND), value as a long-term investment (LTINV), and wise use of corporate assets (WISASS). We expected this subjective factor to correlate positively with the accounting- and market-based factors.

Contextual Dimensions

Industry and size are two contextual dimensions that need to be accounted for in a study of this type. To control for industry effects in the accounting measures, each firm's indicators were adjusted using Standard Industry Classification (SIC) codes by subtracting the dominant two-digit industry's median for each indicator from their firm's counterpart. The dominant two-digit industry represents the segment producing the majority of firm sales. Market performance indicators are implicitly adjusted by regressing firm returns on market returns. The subjective measure is also implicitly adjusted for industry because respondents are asked to rate firms in their own industry (Fryxell & Wang, 1994).

We controlled for firm size by taking the logarithms of assets, sales, and employees and adjusting them for industry by subtracting the dominant two-digit industry's median logarithm of sales, employees, and assets from the comparable firm indicators. These three indicators of size are expected to load on the underlying dimension of size. In addition, all other indicators were allowed to load on the size factor (see Table 3, Figure 1, and Figure 2). This was done to extract as much variance (due to size) as possible from the data set before assessing the other dimensions. In addition, the interfactor covariances between size and each of the other factors were fixed at zero.

Table 1

The Means, Standard Deviations, Skewness, Kurtosis, and Covariances of the Variables Used to Assess the First- and Second-Order Models

Variables	*M*	*SD*	Skewness	Kurtosis	ROA	ROIC	CFOE	Sharpe	Treynor	AppRatio	QOM	LTINV	SOUND	WISASS	RelLass	RelLemp	RelLsal
RelROA	0.000	0.996	-0.09	7.70	0.992												
RelROIC	0.005	1.003	0.06	1.86	0.929	1.006											
RelCFOE	-0.001	1.001	1.22	6.60	0.645	0.715	1.002										
Sharpe	0.003	0.996	0.73	1.08	0.190	0.202	0.157	0.992									
Treynor	0.112	0.371	1.08	3.89	0.053	0.058	0.048	0.305	0.138								
AppRatio	-0.006	0.137	-0.11	-0.11	0.032	0.035	0.028	0.090	0.030	0.019							
QOM	6.603	1.045	-0.38	0.60	0.481	0.500	0.284	0.161	0.035	0.025	1.092						
LTINV	6.149	1.069	-0.55	1.23	0.551	0.557	0.295	0.197	0.043	0.031	0.998	1.142					
SOUND	6.466	1.274	-0.75	1.26	0.679	0.704	0.273	0.211	0.048	0.035	1.073	1.232	1.622				
WISASS	6.158	0.979	-0.58	1.02	0.552	0.539	0.287	0.173	0.038	0.027	0.953	0.970	1.101	0.957			
RelLass	3.744	1.482	0.23	0.36	0.178	0.234	0.275	0.022	-0.009	-0.003	0.187	0.262	0.369	0.167	2.197		
RelLemp	3.456	1.478	0.06	0.39	0.264	0.321	0.330	0.036	-0.001	0.000	0.155	0.233	0.357	0.163	1.959	2.186	
RelLsal	3.635	1.487	0.17	0.44	0.264	0.321	0.353	0.035	-0.002	0.000	0.183	0.260	0.373	0.174	2.101	2.071	2.210

Sample

Fortune has been asking key informants (executives, outside directors, and business analysts) to rate the 10 largest companies in their industry since 1982. The total number of firms covered by the reputation survey has grown from 200 in 1982 to 311 in 1992, while the number of industries represented has grown from 20 to 32. *Fortune* has mailed out approximately 8,000 surveys every year apart from 1982 (6,000 responses requested) and 1983 (7,000 responses requested). The response rate has ranged from 40% to 50%. We used the ratings published from 1982 to 1992. Missing accounting- and market-based data reduced the number of firm-year observations from 3,104 to 2,398.

Fortune conducts its survey from September to December of each year and publishes it in January or February of the following year. The accounting- and market-based data were collected from COMPUSTAT and CRSP, respectively. Accounting-based indicators reflect the firm's published data for the fiscal year ending before January 1 of the year in which the ratings were published. For market-based indicators, weekly firm returns and value-weighted market returns (including all distributions) for each year were used. The weekly risk-free rate is not available from CRSP, so it was obtained from the Thursday edition of *The Wall Street Journal* for the years 1982 to 1992 (when the Thursday edition was not available, the Wednesday edition was used).

Variable Transformations

To achieve a reasonable data set for the LISREL framework, some of the data had to be transformed. All 13 variables were examined for normality using the third and fourth order moments, and we were able to reduce the skewness of the data set to acceptable levels. Unfortunately, three of the variables—RELROA (7.7), RELCFOE (6.6), and TREYNOR (3.9)—were still highly kurtotic, and this lack of normality could not be solved by the commonly used methods of transformation. Consequently, weighted least squares (an asymptotic distribution-free estimation method in LISREL) was used. The means, standard deviations, skewness, kurtosis, and covariances for the final data set are shown in Table 1.

Four variables (Sharpe's measure, RELROA, RELROIC, and RELCFOE) were standardized to bring their variances in line with those of the other variables. This was done to ease the computational difficulties that are sometimes encountered when inverting large covariance matrices with dissimilar variances. Finally, during the data analysis phase, we encountered problems with nonpositive definite matrices, so we used the ridge option, as recommended by Wothke (1993), in LISREL VII to modify the diagonal of the observed covariance matrix. In addition, in the final first-order model and the second-order model, the Theta Delta and Theta Epsilon matrices were not positive definite. This was resolved by using a ridge constant of 0.02 instead of the default value of 0.001.

Confirmatory Factor Analysis: The LISREL VII Approach

The present study examined the factor structure of financial performance using confirmatory factor analysis

Table 2
Fit Indices for the First- and Second-Order Factor Models

Models		Fit indices for the first-order factor model						
		χ^2	*df*	GFI	CFI	NFI	AGFI	DELTA
1	No TDs Free	683.0	52	0.90	0.81	0.81	0.82	0.81
1A	1 & TD 11, 1 Free	668.3	51	0.90	0.81	0.81	0.82	0.81
1B	1A & TD10, 7 Free	506.7	50	0.92	0.86	0.86	0.82	0.86
1C	1B & TD 8, 7 Free	416.7	49	0.94	0.88	0.88	0.88	0.88
1D	1C & TD 9, 3 Free	321.9	48	0.95	0.91	0.91	0.91	0.91
1E	1D & TD 5, 4 Free	258.9	47	0.97	0.93	0.93	0.93	0.93
Models		Fit indices for the second-order factor model						
		χ^2	*df*	GFI	CFI	NFI	AGFI	DELTA
2		258.9	47	0.97	0.93	0.93	0.93	0.93

(CFA) in LISREL VII. Three latent variables were hypothesized to underlie the 10 observed indicators of financial performance drawn from the strategic management literature on firm performance. It was hypothesized that these underlying latent variables correspond to the dimensions of financial performance discussed above (see Figure 1). In addition, an alternative second-order factor model was tested to determine whether covariation among the first-order latent variables (or dimensions of financial performance) could be adequately explained by the more general concept of financial performance. In other words, the dimensions of financial performance that influence the indicators described above may themselves be influenced by another latent variable, financial performance, that need not have a direct effect on the indicators. This model is a second-order CFA (see Figure 2).

LISREL Analyses of the CFA Models

This section describes the results of the LISREL CFAs. In the first set of analyses, the ability of the hypothesized first-order model (Figure 1) to fit the data is tested. In the second analysis, the ability of the hypothesized second-order model to fit the data, and in doing so explain the covariation among the first-order factors, is tested. The analysis of the first-order factors is an application of the measurement model, while the analysis of the second-order factor model incorporates structural relations among the latent factors (Marsh & Hocevar, 1985).

First-Order Factor Model

Estimation of the initial model yielded a GFI of 0.90 and a CFI of 0.82 (see Table 2). To achieve a satisfactory fit, five of the off-diagonal covariances in the Theta Delta matrix were sequentially freed. The error terms freed were: wise use of assets (TD 10) with quality of management (TD 7), assets (TD 11) with return on assets (TD 1), value as a long-term investment (TD 8) with quality of management (TD 7), financial soundness (TD 9) with cash flow over equity (TD 3), and Treynor's (TD 5) with Sharpe's (TD 4). This is less than 6.5% (5 of 78) of the possible error terms that could have been freed.

We used two types of indices to assess fit in the CFA: lack-of-fit indices and goodness-of-fit indices (Mulaik et al., 1989). The lack-of-fit index used was the chi-square test. The goodness-of-fit indices used were the goodness-of-fit index (GFI), the adjusted goodness-of-fit index (AGFI), Bentler's comparative fit index (CFI), Bentler and Bonet's coefficient delta (DELTA), and Bentler and Bonet's normed coefficient index (NFI). These are reported in Table 2.

These fit indices suggest that the data fit the model well when several of the error covariances are free to be estimated (as in model 1E in Table 2). Hoskisson et al. (1994) maintained that the CFI is probably the best index. Certainly, it is not sample-size dependent and does not favour more complex or smaller models. For model 1E, the CFI is .927, and the GFI is .965.

Table 3
Completely Standardized Solution for the First-Order Factor Model 1E

	The Lambda X matrix			
Indicants	Accounting dimension	Market dimension	Reputation dimension	Size dimension
RELROA	0.922	0	0	0.154
RELROIC	0.966	0	0	0.193
RELCFOE	0.711	0	0	0.254
SHARPE	0	0.732	0	0.028NS[a]
TREYNOR	0	0.647	0	0.007NS
APPRATIO	0	0.888	0	-0.013NS
QOM	0	0	0.865	0.114
LTINV	0	0	0.952	0.161
SOUND	0	0	0.900	0.201
WISASS	0	0	0.936	0.123
RELLASS	0	0	0	0.949
RELLEMP	0	0	0	0.934
RELLSAL	0	0	0	0.990

	The Phi matrix			
Financial performance factors	Accounting dimension	Market dimension	Reputation dimension	Size dimension
Accounting dimension	1			
Market dimension	0.298	1		
Reputation dimension	0.632	0.285	1	
Size dimension	0	0	0	1

Notes. The interfactor correlations are all significant at $p < 0.05$. The covariances between size and the other dimensions is fixed at zero as size is being used as a control factor. The Theta Delta matrix is not reported.

[a]NS means that these three loadings were nonsignificant. The rest were significant at $p < 0.05$.

The Completely Standardized Solution

The analysis to this point suggests that model 1E has a reasonably good fit. We now examine the completely standardized solution for model 1E, which gives the standardized factor loadings of the indicants on each underlying construct (Lambda X matrix), the standardized variance-covariance matrix of the latent factors (Phi matrix), and the variances-covariances matrix of errors of measurement (Theta Delta matrix). The factor loading and the factor covariance matrices for model 1E are reported in Table 3.

The results demonstrate that all of the primary loadings are significant and that the indicants load very well on their respective factors. With respect to the secondary loadings to control for size, eight were significant, with loadings from 0.11 to 0.25, and three were insignificant.

The Phi matrix indicates that the interfactor correlations are all significant. Subjective and accounting measures appear to be strongly correlated at 0.63, while the market-based factor is correlated with both the subjective and accounting measures at 0.29. While these correlations among the three focal factors are significant, the squared interfactor correlation (0.29^2) between the mar-

Table 4
The Parameter Estimates for the First-Order Factors in the Second-Order Model (the Gamma Matrix)

Financial performance factors	Second-order factor
Accounting dimension	0.813
Market dimension	0.366
Reputation dimension	0.778
Size dimension[a]	0

Residual errors for the first-order factors in the second-order model (the PSI matrix)

Financial performance factors	Accounting Dimension	Market dimension	Reputation dimension	Size dimension
Accounting dimension	0.339			
Market dimension	0	0.866		
Reputation dimension	0	0	0.394	
Size dimension	0	0	0	1.000

[a]The size factor loading is fixed at zero as the size factor is a control factor. All three loadings are significant at $p < 0.05$.

ket construct and the accounting and subjective constructs is only 0.084, meaning that the shared variance between the market construct and the accounting and subjective constructs is only 8.4%. Thus, although there is statistical evidence to support Hypothesis 1A, there may not be substantive support.

Second-Order Factor Model

Given the significant correlations among the factors and the theory developed in this study, we tested whether the three primary factors of accounting performance, market performance, and subjective performance loaded significantly on a single second-order factor, financial performance. When the second-order factor model was fit to the data, the loadings of accounting performance, market performance, and financial performance were all highly significant. The goodness-of-fit indices for model 2 are reported in Table 2. They indicate that the data fit the model moderately well, as was true for model 1E. The completely standardized solution for the Lambda Y matrix is the same as for model 1E. In addition, the Theta Epsilon is the same as the Theta Delta matrix for model 1E. More interesting in the completely standardized solution for model 2 are the Gamma and Psi matrices. These are reported in Table 4. As shown in Table 4, the factor loadings of the first-order factors on the second factor are all significant. This result suggests that covariation among the first-order dimensions of accounting performance, market performance, and subjective performance can be explained by their causal association with a general second-order factor. The pattern of the significant loadings of the first-order factors on the second-order factor suggests that the covariation among the primary dimensions is due to the fact that they are all indicators of a more abstract theme of financial performance. Consequently, there is support for Hypothesis 1B, which argued that the three dimensions of financial performance will be heavily influenced by the underlying concept of financial performance. However, the standardized loading of the first-order factor, market performance, was only 0.366.

Discussion and Conclusion

The statistically significant correlations among the subjective, accounting, and market-based factors reported in Table 3 support Hypothesis 1A, which is consistent with the results of Hoskisson et al. (1993, 1994). However, one of the most striking findings in these results is the variance in the correlations among these three factors. Given our theoretical arguments, we are surprised by the relatively low correlation (.298) between the market and accounting dimensions and the market and subjective dimensions of firm financial performance. While

our finding is consistent with that of Hoskisson et al. (1993), who found a correlation between accounting and market performance of .282, it is much lower than a later study by Hoskisson et al. (1994), which found a .554 correlation between their accounting and market dimensions of performance. We are also surprised by the low loading (.366) of our market dimension on the second-order factor of firm financial performance relative to the loadings of the other first-order factors (.813 for the accounting dimension and .778 for the subjective dimension). However, the statistical significance of these loadings supports Hypothesis 1B.

There are at least two explanations for the unexpected results in this study, and both relate to the issue of temporal span. The first is whether a measure of firm performance makes a retrospective or prospective assessment of firm performance. For example, accounting measures of performance offer a retrospective view by measuring the results of a firm's operations during the preceding period. Market measures are prospective measures of performance. They reflect the expectations that investors share regarding the anticipated future performance of the firm. However, subjective measures of performance have no specific temporal span and may therefore be idiosyncratic to the individual providing the assessment of a particular firm's performance. As such, a subjective measure of performance could be retrospective if it reflects the rater's view of a firm's past performance or prospective if it reflects the rater's view of a firm's future potential. Consistent with past research (Cannella & Rowe, 1994; Fombrun & Shanley, 1990; Fryxell & Wang, 1994), our findings suggest that the Fortune reputation survey is a retrospective view of a firm's performance. However, if subjective ratings provided by members of the top management team (Dess & Robinson, 1984) or informed outsiders such as securities analysts (Cannella & Hambrick, 1993) took a prospective view of firm performance, they would arguably correlate higher with market measures of performance than the *Fortune* ratings used in this study.

The second temporal issue that could explain some of the surprise findings is the longitudinal nature of our research design. Fryxell and Barton (1990) found that the degree to which the measurement structure of accounting- and market-based performance measures converged on a single financial performance construct varied during periods of economic stability and instability and according to the diversification strategy of the firms in their sample. Thus, they concluded that the measurement structure of accounting and market measures of performance may change over time and context. While a cross-sectional research design would have allowed us to control for these two variables, our longitudinal design allows us to generalize our findings across time.

Our results can be interpreted in two ways. Venkatraman and Ramanujam (1986) implied that firm financial performance is a unidimensional construct that could be operationalized using either accounting- or market-based measures. The present research supports Venkatraman and Ramanujam's view of firm financial performance, but also suggests that subjective indicators of a firm's financial performance can be used to gain insights into financial performance. The idea that accounting, market, and subjective measures of firm financial performance are distinct and yet similar in that they provide insights into a firm's underlying financial performance seems to be consistent with much of the theoretical and empirical research in the strategic management literature (Cannella & Hambrick, 1993; Dess & Robinson, 1984; Hoskisson et al., 1993, 1994; Venkatraman & Ramanujam, 1986).

On the other hand, some scholars could cite the relatively low correlation between our market and accounting dimensions (.298) and the low loading of our market dimension on the second-order factor of firm financial performance (.366) as less than convincing evidence to support our hypotheses. They might reasonably argue that at best we have shown firm performance to have two distinct dimensions, market and accounting, with the accounting dimension consisting of accounting returns and subjective interpretations of a firm's accounting returns. This view also has theoretical and empirical support in the strategic management literature (Barney, 1997; Bentson, 1982; Fisher & McGowan, 1983; Watts & Zimmerman, 1978, 1990).

Our interpretation of this research is that it supports the view that the firm financial performance construct has a higher order structure. We offered theoretical arguments to support our hypotheses and then tested these hypotheses using an appropriate statistical methodology (confirmatory factor analysis). While some of the loadings and correlations may be low, they are nevertheless statistically significant, which supports our theoretically derived hypotheses. We contend that the notion that accounting, market, and subjective measures are distinct yet provide insights into a firm's underlying financial performance, enjoys widespread support in the literature. Many of those who argue that accounting and market measures are separate and distinct measures of performance come from backgrounds in accounting, finance, and economics rather than strategic management. Finally, we believe that our low correlations and loadings (like the differences found by Hoskisson et al. between their 1993 and 1994 studies) can be attributed to issues of timing and strategy, as raised by Fryxell and Barton (1990). While a cross-sectional research design could have controlled for these issues, our longitudinal design allows for greater generalizability.

Finally, it is not our contention that this research lays to rest the controversy concerning the proper operationalization of the firm financial performance construct in future strategic management research. On the contrary, firm financial performance remains a messy issue at best, and this research arguably raised more questions than it answered. For example, we only considered one dimension of overall firm performance (firm financial performance) and did not consider broader conceptualizations of a firm's overall performance such as operational effectiveness, superordinate goals (Venkatraman & Ramanujam, 1986), and social performance (although we suggest that subjective performance measures may be used to tap social performance). It would be interesting to see if these broader views of firm performance also underlie the financial performance construct or if they measure a dimension of firm performance that is entirely separate from financial performance. Based on our research, we would suggest that strategy researchers be more explicit with respect to their rationale for the type of financial performance measure they use in their research and, where appropriate, use at least two of the three measures (market, accounting, or subjective) we used in our research. Perhaps most important, while we controlled for size and industry, there may be variables that could cause the model developed here to be variant. For example, the findings from this study may not be useful when conducting a cross-sectional study that focuses only on periods of economic expansion or recession or in cases where the sample contains only single-product or highly diversified firms (Fryxell & Barton, 1990). We hope that the results of this research will encourage others to explore these issues as we continue to search for the true underlying meaning of firm performance.

References

Alexander, G.J., & Francis, J.C. (1986). *Portfolio analysis.* (3rd ed). Englewood Cliffs, NJ: Prentice-Hall.

Barney, J.B. (1997). *Gaining and sustaining competitive advantage.* Reading, MA: Addison-Wesley.

Bentson, G. (1982). Accounting numbers and economic values. *Antitrust Bulletin, 2* (2a), 161-215.

Bodie, Z., Kane, A., & Marcus, A.J. (1993). *Investments.* (2nd ed). Boston, MA: Irwin.

Bromily, P. (1990). On the use of finance theory in strategic management. *Advances in Strategic Management, 6*, 71-98.

Cannella, A.A., Jr., & Hambrick, D.C. (1993). Effects of executive departures on the performance of acquired firms. *Strategic Management Journal, 14*, 137-152.

Cannella, A.A, Jr., & Rowe, W.G. (1994). *Performance leads to reputation, which leads to performance: A theoretical and empirical examination of reputation as an outcome and an antecedent.* Paper presented at the annual meeting of the Academy of Management, Dallas, TX.

Dess, G.G., & Robinson, R. B., Jr. (1984). Measuring organizational performance: The case of the privately-held firm and conglomerate business unit. *Strategic Management Journal, 5*, 265-273.

Fisher, F.M., & McGowan, J.J. (1983). On the misuse of accounting rates of return to infer monopoly profits. *American Economic Review, 73*, 82-97.

Fombrun, C., & Shanley, M. (1990). What's in a name? Reputation building and corporate strategy. *Academy of Management Journal, 33* (2), 233-258.

Fryxell, G.E., & Barton, S.L. (1990). Temporal and contextual change in the measurement structure of financial performance: Implications for strategy research. *Journal of Management, 16* (3), 553-569.

Fryxell, G.E., & Wang, J. (1994). The *Fortune* corporate "reputation" index: Reputation for what? *Journal of Management, 20* (1), 1-14.

Hambrick, D.C., & Schecter, S. (1983). Turnaround strategies in mature industrial product business units. *Academy of Management Journal, 26*, 231-248.

Horowitz, I. (1984). The misuse of accounting rates of return: Comment. *American Economic Review, 74*, 492-493.

Hoskisson, R.E., Hitt, M.A., Johnson, R.A., & Moesel, D.D. (1993). Construct validity of an objective (entropy) categorical measure of diversification strategy. *Strategic Management Journal, 14*, 215- 235.

Hoskisson, R.E., & Johnson, R.A. (1992). Corporate restructuring and strategic change: The effect on diversification and R&D intensity. *Strategic Management Journal, 13*, 625-634.

Hoskisson, R.R., Johnson, R.A., & Moesel, D.D. (1994). Corporate divestiture intensity in restructuring firms: Effects of governance, strategy, and performance. *Academy of Management Journal, 37* (5), 1207-1251.

Jacobson, R. (1987). The validity of ROI as a measure of business performance. *American Economic Review, 77*, 470-478.

Jensen, M.C., & Meckling, W.H. (1976). Theory of the firm: Managerial behavior, agency costs, and ownership structure. *Journal of Financial Economics, 3*, 305-360.

Keats, B. W. (1990). Diversification and business economic performance revisited: Issues of measurement and causality. *Journal of Management, 16*, 61-71.

Long, W.F., & Ravenscraft, D.J. (1984). The misuse of accounting rates of return: Comment. *American Economic Review, 74*, 494-500.

Marsh, H.W., & Hocevar, D. (1985). Application of confirmatory factor analysis to the study of self-concept: First- and higher-order factor models and their invariance across groups. *Psychological Bulletin, 97* (3), 562-582.

Morrow, J.L., Jr., Busenitz, L.W., & Johnson, R.A. (1997). *The effects of cost and asset retrenchment on firm performance: The overlooked role of a firm's competitive environment.* Paper presented at the annual meeting of the Academy of Management, Boston, MA.

Mulaik, S.A., James, L.R., Van Alstine, J., Bennett, N., Lind, S., & Stilwell, C.D. (1989). Evaluation of goodness-of-fit

indices for structure equation models. *Psychological Bulletin, 105* (3), 430-445.

Pearce, J.A., & Robbins, D.K. (1993). Toward improved theory and research on business turnaround. *Journal of Management, 19*, 613-636.

Schendel, D.E., & Hofer, C.W. (Eds.). (1979). *Strategic management: A new view of business policy and planning.* Boston, MA: Little Brown.

Seth, A. (1990). Value creation in acquisitions: A re-examination of performance issues. *Strategic Management Journal, 11*, 99-115.

Venkatraman, N., & Ramanujam, V. (1986). Measurement of business performance in strategy research: A comparison of approaches. *Academy of Management Review, 11* (4), 801-814.

Watts, R.L., & Zimmerman, J.L. (1978). Towards a positive theory of the determination of accounting standards. *The Accounting Review, 53*, 112-133.

Watts, R.L., & Zimmerman, J.L. (1990). Positive accounting theory: A ten year perspective. *The Accounting Review, 65*, 131-156.

Wothke, W. (1993). Nonpositive definite matrices in structural modeling. In K.A. Bollen & J.S. Long (Eds.), *Testing structural equation models.* Newbury Park, CA: Sage.