

Management Practices and Organizational Performance: A Longitudinal Analysis using Cross-Lagged Data

Phoebe M. Massimino, York College CUNY, Jamaica, USA
Richard E. Kopelman, Baruch College CUNY, New York, USA

ABSTRACT

An extensive literature has accumulated pertinent to various management and marketing practices and organizational performance. With regard to HRM practices alone, a meta-analysis identified more than 100 studies. Although positive relationships have almost universally been found, longitudinal analyses have been scarce; and the few longitudinal studies have almost exclusively looked at one causal priority—practices at time 1 and organizational performance at time 2. Yet, “reverse causation” is quite plausible, i.e., that organizational performance may lead to the subsequent enactment of various practices. The present research examines cross-lagged longitudinal data from 219 companies in 44 industries in order to make inferences about causal relationships. Management/marketing practices were assessed using Fortune ratings and organizational performance was assessed using the objective criterion of market capitalization. In brief, the following fundamental question is addressed: Is there a stronger relationship between management/marketing practices at time 1 and company performance at time 2, or is there a stronger relationship between company performance at time 1 and management/marketing practices at time 2?

LITERATURE REVIEW

Over the past fifteen years, a sizable literature has developed focusing on relationships between various business practices (such as those related to quality management, human resource management, customer service, marketing, and general management/leadership) and multiple organizational outcomes (such as operating efficiency, profit, market capitalization, employee turnover and other criteria)—(e.g., Becker & Gerhart, 1996; Boselie, Dietz, & Boon, 2005; Combs, Liu, Hall, & Ketchen, 2006; Guest, Michie, Conway, & Sheehan, 2003; Harter, Schmidt, & Hayes, 2002; Hendricks & Singhal, 1996; Huselid, 1995; Huselid & Becker, 1997; Nair, 2006; Wright, Gardner, Moynihan, & Allen, 2005). Indeed, a meta-analysis of studies focusing solely on HR practices (Boselie et al., 2005) identified 104 different studies; and a slightly more restrictive meta-analysis examined the effects of High Performance Work Practices (HPWP) on Organizational Performance in 92 studies (Combs et al., 2006).

Not only have there been numerous empirical studies, the results have been quite varied. Most studies have reported positive associations for particular practices and performance metrics; but some have found no associations or negative associations. Contrasting research paradigms, frames of reference (i.e., types of practices and organizational criteria), and differing methods of measurement partly account for the disparate research findings regarding relationships between business practices and organizational outcomes. Other complicating factors include the study's unit of measurement, (e.g., department, business unit, or organization), the size of the enterprise, the type industry (new versus mature), the sector (for-profit versus nonprofit), and the time lag (if any) incorporated into the research design.

The issue of causality is a current and recurrent theme. Do business practices influence or cause organizational outcomes, or, do organizational outcomes influence/cause business practices? Findings pertinent to the directionality of influence (or what has been called causal priority), seemingly vary depending on study particulars. As Schneider, Hanges, Smith, and Salvaggio (2003) put it: “How can it be that in some studies the results run predominantly in one causal direction whereas in other studies the results appear to run in the other direction? The answer seems to be that different variables are being studied in the different projects” (p. 846).

Not only do multiple variables influence relationships between practices and organizational outcomes, prior levels of organizational performance are an important factor. For instance, HR practices have been positively associated with

profitability in manufacturing companies, but associations have been found to disappear once profitability in prior years has been taken into account (Guest et al., 2003). Others point out the possibility of relationships being spurious, such that both management practices and organizational performance can be “explained” by a third variable such as good leadership—viz. that good leadership improves organizational performance by implementing high performance work practices (Combs et al., 2006; Wright et al., 2005).

Along these lines, Guest et al. (2003) caution that although there have generally been positive associations between level of HR practices and some measures of organizational performance, “there is no convincing evidence that use of HR practices is associated with a change in performance” (p. 292). In large measure, the evidence may not be “convincing,” because reverse correlations have largely gone unexamined—i.e., relationships between prior levels of organizational performance and subsequent levels of HR practices. Yet, on the whole there is abundant evidence of positive associations between HR practices and performance. Indeed, Wright et al. (2005) report that research has “universally” reported significant relationships between HR and performance (p. 416).

Research by Gibson, Porath, Benson, and Lawler (2007) studied relationships among organizational practices (as reported in surveys) and objective financial performance among a sample of Fortune 1000 firms. Because cross lagged correlational data were only available for 47 firms, only concurrent correlations were reported. One HR practice (sharing strategic information) was associated with firm performance, but others (e.g., enabling team performance) were not.

Of course, there are other types of practices that influence organizational performance in addition to those related to HRM. In the context of marketing, Cano, Carrillat, and Jaramillo (2004) found that the degree of market orientation of a firm explains about 12% of the variance in business performance. With regard to quality of products/services, there is evidence of a positive association with firm performance. Nair (2006) advises managers, “Overall, the results reveal a positive correlation between several QM [Quality Management] practices and firm performance dimensions. This provides impetus for practitioners to continue adopting QM practices in their organizations” (p. 972).

Conversely, it has been posited that the primary causal priority may be from organizational performance to enacted managerial practices—what Wright et al. (2005) call “reverse causation.” High-performing organizations will have resources that they can share with employees, yielding: higher compensation, better training, and opportunities for personal growth. Consistent with this premise, Johnson, Davis, and Albright (2009) found that improvements in bank returns on assets (ROA) were associated with high levels of employees attitudes in comparison to the attitudes of employees where there had been little or negative changes in ROA. However, Johnson et al.’s (2009) banking data were not cross-lagged; only ROA data were examined at two points in time, thus not ruling out the possibility that attitudes affected subsequent ROA. Further, this research did not examine

practices per se, just attitudes and organizational performance.

In a meta-analysis pertinent to TQM practices, Choi and Eboch (1998) found that levels of customer demands may be more likely to prompt TQM practices than vice versa. But the Choi and Eboch review did not examine data with different temporal orderings, so the findings might be most aptly described as suggestive.

There is also the possibility of reciprocal causation, or what might be characterized as “virtuous” or “death spiral” cycles. Regarding Corporate Social Responsibility, Orlitzky, Schmidt, and Rynes (2003) based on a meta-analysis of 52 studies concluded that CSR and corporate financial performance (CFP) are mutually interacting, such that financially successful companies can spend more for CSR which may help them become more successful: “Moreover, the causation seems to be that CSP and CFP mutually affect each other through a virtuous cycle: financially successful companies spend more because they can afford it, but CSP also helps them become a bit more successful” (p. 424).

Mutual interdependence was also suggested in the study by Wright et al. (2005). They concluded that their study demonstrates that HR practices were strongly related both to future and past performance. It might be noted that HR practices and employee attitudes were assessed at one point in time and financial results were measured both before and after.

Along these lines, Schneider et al. (2003) propose that “a likely framework in which future such research might be conceptualized is one in which (a) high-performance work practices are seen as leading to organizational financial and market performance through improvements in production efficiency; (b) financial and market performance yields

increased levels of Satisfaction With Security (through improved benefits) and OJS [overall job satisfaction] (through improved reputation); and (c) financial and market performance also yields increased pay levels, resulting in increased Satisfaction With Pay, which gets reflected in improved production efficiency through the display of OCB [organizational citizenship behaviors]” (p. 849). Schneider et al. (2003) found good support for organizational financial performance as influencing subsequent employee job satisfaction, and to a lesser extent employee attitudes were predictive of organizational financial results. Although Schneider et al.’s (2003) research did examine lagged data for financial performance and employee attitudes, managerial practices per se were not examined.

Tsai, Edwards, and Sengupta (2010) stated, “For example, to improve organisational performance, inputs from HRM practices and employee attitudes will be important; on the other hand, any changes in performance will be likely to affect firms' HRM practices and employee attitudes” (p. 17). These authors reported that their research found that organizational performance affected employee attitudes and HRM practices, more so than versa. However, because all the data in the Tsai et al. (2010) study were cross-sectional, causal priorities were unclear.

In brief, very few studies have examined associations between organizational performance and managerial practices (as distinct from employee attitudes) using longitudinal data. Unfortunately, as Schneider et al. (2003) have noted, empirical tests of causal priorities are rare because they require access to data collected over multiple time periods and, at the organizational level of analysis, from multiple organizations. To our knowledge, just one prior study (Kopelman, 2010) has utilized cross-lagged correlations to examine associations between management practices and organizational performance. The present research builds on that endeavor, examining a more comprehensive measure of practices and data over a three-year as compared to a two-year period. A three year time frame was selected because management practices do not affect company performance instantaneously; rather it takes time for practices to change organizational performance and be reflected in market capitalization.

CORRELATIONS AND CAUSALITY

Although correlational analyses cannot unequivocally establish causality, examination of cross-lagged longitudinal data can provide strong evidentiary support for establishing a causal priority, if one exists. As Pelz and Andrews (1964) noted nearly 50 years ago: “If in fact A determines B rather than the reverse then the cross-lagged correlation A1B2 should exceed the cross-lagged correlation B1A2” (p. 848). Building on their work, Lawler (1968) described the six correlations that result from a complete cross-lagged panel analysis—see Figure 1 for a schematic representation. The key comparisons are the cross-lagged differentials, correlations 5 and 6.

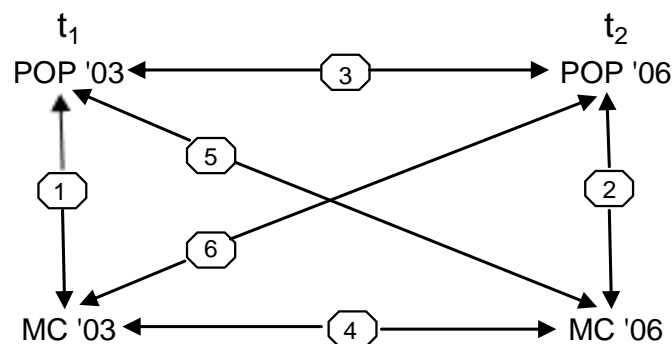


Figure 1: Correlations Comprising the Cross-Lagged Correlational Analysis in the Present Research

As Kenny (1975) noted, if the cross-lagged differential is not zero, “[a]symmetrical cross-lags may indicate a causal effect” (p. 891). He further stated that “The strength of cross-lagged analysis lies in its narrowness; it has been developed for and adapted to panel data analysis. The more common forms of statistical analysis like multiple regression, analysis of variance, and factor analysis though very general may not be easily adaptable to panel studies” (p. 896).

However, Kenny (1975) has cautioned that the more stable a causal factor is, the smaller the cross-lagged differential will be, and, adding more precision, distinguished between the stationarity of a measure—its relative stability—from its stability or autocorrelation. Adding another note of caution, Kenney and Harackiewicz (1979) assert that: “A user of cross-lagged analysis should be warned that if there is *two-way causation*, the cross-lagged difference is affected by the relative stability of both variables. Causal predominance can be judged by a cross-lagged analysis only if the stabilities are equal or nearly equal” (pp. 377-378).

In the present research cross-lagged panel correlations are examined in an attempt to assess causal priorities between management practices that might be seen as predictors of performance (POP) and organizational performance as assessed by market capitalization (MC). Comparison of the two key lagged correlations (5 and 6), essentially captures what Platt (1964) calls “strong inference.” If the correlation between management practices at time 1 and organizational performance at time 2 (POP_1MC_2) exceeds the reverse correlation (MC_1POP_2) this would be supportive of the interpretation that practices cause organizational performance. On the other hand, if the opposite outcome is observed, i.e., $MC_1POP_2 > POP_1MC_2$, the data would be supportive of the interpretation that performance causes practices. And, if the two cross correlations are essentially equal, the data would be supportive of bi-directional interdependencies.

METHODOLOGY

Procedure

Data pertinent to management practices were obtained from *Fortune* magazine’s listing of the World’s Most Admired Companies for the years 2002, 2003, and 2006. These scores reflected judgments made late in the years 2001, 2002 and 2005, respectively. The 2002 and 2003 data were averaged and combined into a composite rating, labeled Predicted Organizational Performance, 2003; and the data published in 2006 were labeled Predicted Organizational Performance, 2006. Organizational Performance was assessed by calculating the market capitalizations of companies for the two years 2002/2003 and the two years 2005/2006. Data were utilized during a more typical economic time period, before the economic crisis that included housing and stock market crashes, a banking crisis, government bailouts of some major corporations, all of which have been characterized as the “Great Recession”. All data were analyzed on a within- industry basis, with company as the unit of analysis.

Measures

Eight performance attributes were used to assess company performance: (1) ability to attract and retain talented people; (2) quality of management; (3) social responsibility to the community and the environment; (4) innovativeness; (5) quality of products or services; (6) wise use of corporate assets; (7) financial soundness; and (8) long-term investment value. (In 2009 a 9th attribute was added, effectiveness in doing business globally.) Attribute ratings were obtained by the Hay Group on behalf of *Fortune* by querying top executives, directors and financial analysts for companies individually and relative to peer organizations. Ratings for 2002 were obtained from 10,000 executives, directors, and securities analysts regarding the 10 largest firms in each of 66 industries (by revenues), 11-point scales with endpoints of zero (poor) and ten (excellent). Mean attribute ratings were published in *Fortune* magazine in 2003. An almost identical methodology was used in calculating mean ratings for 2003, the only difference being that for some industries 11 companies were rated (Harrington, 2004).

The relative capitalized market value of each company in each industry was used to assess organizational performance. Although this metric is affected by many factors, including the debt and financial leverage of a company, it possesses the positive feature of being fully objective since it represents the dollar market value of all of a company’s outstanding shares. Market capitalization (MC) data were computed for each company during every day of the two-year trading periods of 2002-2003 and in 2005-2006. Mean market capitalizations were computed for each company during each two-year period (the information being accessed via Bloomberg terminals).

Analyses

For each industry Spearman rank-order correlations were computed between ranked management practices (POP measures) and ranked organizational performance measures (MC data). Companies which did not remain publicly traded entities throughout the period from 2002 through 2006 were dropped from the analyses. Thus the number of companies in the potential initial pool dropped from 577 in the 2002 WMAC listing (some companies going out of business; others being acquired or taken private; some industry categories being dropped; and some companies dropping out of the top ten in industry revenues) to 219 in 2006. Of the 219 companies in 48 industries, 8 companies were in industries with data for only two companies, so the final sample was comprised of 211 companies in 44 industries. As noted above, Spearman rank-order correlations were calculated for each industry. Because correlation coefficients are necessarily constrained (between 1 and -1), mean correlational results were computed after performing r to z transformations.

RESULTS

The focus of the present research is on the relationship between management practices as assessed via attribute ratings of the Most Admired Companies and organizational performance as assessed by market capitalization data. As noted above, attribute ratings have been labeled Predicted Organizational Performance (POP) and were measured in 2003 and 2006, and market capitalization (MC) data were, correspondingly obtained for 2002/3 and for 2005/6. On a contemporaneous basis, mean correlations between POP and MC in 2003 and 2006 were .7008 ($p < .001$) and .6226 ($p < .001$), respectively—see Table 1.

Table 1: Mean Correlations between Predicted Organizational Performance and Market Capitalizations: Concurrent and Cross-Lagged Results

Number of Companies in Industry	Number in Category	1	2	3	4	5	6
		POP '03 MC '03	POP '06 MC '06	POP '03 POP '06	MC '03 MC '06	POP '03 MC '06	POP '06 MC '03
3 to 4	(k = 21)	0.7441***	0.6707***	0.7900***	0.9623***	0.6635***	0.2454
5 to 6	(k = 14)	0.5629*	0.6180**	0.5201*	0.9616***	0.5175*	0.3909
7 to 8	(k = 9)	0.7690**	0.4966	0.6571*	0.9317***	0.6702*	0.6352*
All Industries	(k = 44)	0.7008***	0.6226***	0.6941***	0.9572***	0.6228***	0.3836**

Notes: POP = predicted organizational performance; MC = market capitalization; k = number of industries in category

* $p < .05$ (one-tailed); ** $p < .01$ (one-tailed); *** $p < .001$ (one-tailed)

That there is a positive association between attribute ratings and market capitalizations is a phenomenon that has previously been reported in the literature as reflective of a “halo effect” (Brown & Perry, 1994; Fryxell & Wang, 1994). As Brown and Perry (1994) put it: “Unfortunately, the Fortune most admired ratings have been shown to be heavily influenced by previous financial performance” (p. 1348). Further, according to Fryxell and Wang (1994) the “dominant factor” underlying the most admired company ratings “appears to be primarily financial in its construct domain” (p. 11). That prior financial performance (or MC) influences subsequent assessments of managerial attributes (POP in the present research) has important implications for the present research which are addressed further in the discussion section.

The primary research question addressed by the present investigation concerns the relative magnitudes of the two lagged relationships, i.e., do the data suggest that practices influence subsequent organizational performance or vice versa. In this regard, results are examined based on the number of companies in each industry, and for the total sample. In industries with 3 or 4 companies, the key correlations were as follows: for POP_1MC_2 the mean correlation was $r = .6635$ and for MC_1POP_2 the mean correlation was $r = .2454$. Although the proportions of explained variance differed substantially at 44.02% (.6635 squared) versus 6.02% (.2454 squared)—a seven-fold multiple, the magnitude of the difference just barely reached statistical significance $Z = 1.65$ ($p = .05$, one-tailed). But, given the limited statistical power in the present research, (i.e., there being only 21 industries with 3 or 4 companies), finding a significant difference is notable.

With regard to industries with 5 to 6 companies the two lagged correlations were again in the direction that practices are more related to subsequent performance than vice versa, the mean correlations being $r = .5175$ and $r = .3909$, respectively. With only 9 industries in this analysis, results were not significant. In industries with 7 to 8 companies, results were directionally similar, but not significant with r s of $.6702$ and $.6352$. For the entire sample with 44 observations, mean correlations for POP_1MC_2 and MC_1POP_2 , were $r = .6228$ and $r = .3836$, respectively, $Z = 1.47$. ($p = .07$, one tailed).

The present results might be compared to those found in a recent study using a similar methodology (Kopelman, 2010). In that study, data were examined for a 2-year period (versus a 3-year interval in the present research) and using three MAC attribute ratings (versus all eight). In the prior study the overall POP_1MC_2 and MC_1POP_2 correlations were $r = .60$ and $r = .50$, respectively, $Z = .71$ ($p = .24$).

DISCUSSION

As Wright et al. (2005) noted, significant positive relationships have universally been found between HRM practices and organizational performance, however studies very seldomly tested for both causal orders. This state of affairs has been explained by Schneider et al. (2003) who point out that tests of alternate causal priorities are rare because they require: access to data (1) collected over multiple time periods (2) at the organizational level of analysis and (3) from multiple organizations. The present research has met these demands, although several problems pertain.

Using cross-lagged correlational analyses to examine longitudinal relationships between rated attributes of companies and market capitalizations, stronger associations were found between rated attributes (or POP) and performance (MC) than vice versa. However, notwithstanding a sizable difference in mean correlations ($r = .6228$ versus $r = .3836$), the difference was not statistically significant, because the number of cases (industries) was only 44. To be sure, Kenney and Harackiewicz (1979) have advised that a large sample size should be obtained when conducting a cross-lagged correlational analysis and this is fairly easily accomplished if the unit of analysis is individuals. It is not really possible with industries. Had the number of cases equaled the number of organizations instead of number of industries, the present findings would have been significant with $Z = 2.52$, $p < .05$. Future research might analyze data across companies instead of within industries.

The present research found stronger results than a similar prior study ($p < .07$ versus $p = .24$), by examining a 3-year as compared to a 2-year interval. Kenny (1975) has suggested that to be confident of substantive validity, cross lagged correlational analyses should replicate over different time lags, groups of subjects, and measurement operationalizations. In this vein, it is encouraging that a 3-year interval produced a stronger finding than a 2-year interval, and results might be stronger still if the present research is replicated in several years. But as Chhinzher and Ghatehorde (2009) have noted, the duration of lag between HR practices and financial effects is largely unexplored.

Another matter that may be mitigated by lengthening the time between measurements is the established relationship between prior corporate financial performance and attribute ratings (Brown & Perry, 1994; Fryxell & Wang, 1994). As noted above, this association predisposes market capitalizations to be more predictive of managerial practices than vice versa. It might also be noted that if practices affect profits and market capitalization these phenomena are more distal and further “downstream” than factors such as employee attitudes and work behaviors (Harter et al., 2002).

That most admired company attribute ratings and market capitalization data were examined on a panel basis, longitudinally, may also be seen as strengths of the present undertaking. Because a composite measure of the eight performance attributes was used to assess company performance per *Fortune's* most admired ratings, disaggregated scores are unavailable for each attribute. Taken as a whole, they are representative of the collection of management practices. By obtaining data from independent sources, the frequently encountered problem of common method bias is substantially avoided. Although the present research does not measure management practices directly, practices are clearly implied in the attribute ratings, because as Tsoukas and Chia (2002) put it (emphasis in original) “organizations do not simply work; they *are made* to work” (p. 577).

Although correlational data clearly cannot “prove” causality they can be suggestive of causal relationships (Cliff, 1983). The present results suggest there are reciprocal interrelationships between practices and performance, with a somewhat greater effect of practices on performance than vice versa.

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