The Moderating Role of Competition in the Relationship between Nonfinancial Measures and Future Financial Performance*

RAJIV D. BANKER, *Temple University*

RAJ MASHRUWALA, *Washington University in St. Louis*

1. Introduction

The use of nonfinancial measures in management control systems of firms has generated considerable interest among practitioners as well as researchers. The principal rationale presented to justify the use of nonfinancial measures for performance evaluation has been that nonfinancial measures are leading indicators of financial performance (Kaplan and Norton 1992; Ittner and Larcker 1998b). Most studies that have examined the relationship between nonfinancial measures and financial performance have shown mixed results (Ittner and Larcker 1998a; Banker, Potter, and Srinivasan 2000; Amir and Lev 1996). The mixed results suggest that these relationships may be contextual (Kaplan and Norton 1992; Ittner and Larcker 1998b), which makes it important to understand the factors that moderate these relationships before using them in managerial decision making and incorporating them in management control systems. Lambert (1998) argues that customer purchasing behavior is affected by characteristics of the economic environment such as the level of competition. In this study we extend this argument to show that unless we recognize the competitive environment of business units we cannot understand the true relation between nonfinancial measures and financial performance. Emphasizing nonfinancial measures may make sense in locations with high levels of competition. However, the same may not be true where competition is limited and fewer choices exist for customers to shop and employees to work. This is because the lack of competition may result in higher switching costs for customers and employees who may need to travel a greater distance to transact with a new supplier or employer.[1]

We assess whether, and under what competitive conditions, the reporting of nonfinancial measures such as employee satisfaction and customer satisfaction is

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likely to be useful to managers of a retail chain. Our approach models and estimates the relationship between employee satisfaction, customer satisfaction, and earnings, controlling for past earnings. We investigate whether the nonfinancial measures are lead indicators of financial performance and, more importantly, we examine whether these relationships are moderated by competition faced by retail outlets. While earlier studies have examined the relationship between nonfinancial measures and financial performance, they have largely ignored the fact that under certain competitive environments these nonfinancial measures may not have a strong relationship with financial performance. The possibility of a moderating effect of competition is consistent with a long tradition of support for the theory that the environment moderates the effectiveness of organizational characteristics.

Urban stores at our research site are all mall-based. Our scrutiny of internal correspondence reveals that they recognize that urban stores face immediate and intense competition, both for customers as well as for employees. Moreover, most urban areas have several malls and stand-alone stores that provide alternative choices for customers and employees. Thus, an urban customer or employee can find a greater number of alternative choices to shop/work if he or she is not satisfied. There is a lower level of competition for a stand-alone rural store because there are not as many alternatives in the immediate vicinity for customers and employees. As a result, spending more to increase employee and customer satisfaction may not improve financial performance in such competitive conditions. It is important, therefore, to understand the conditions under which emphasizing nonfinancial measures is likely to lead to better financial performance.

We also use a second approach to assess whether managers perceive the reporting of nonfinancial measures such as employee satisfaction and customer satisfaction to be useful to them. We use managers' decisions on performance evaluation and store closure that require predictions of future earnings. We evaluate whether the managerial decisions are correlated with customer satisfaction and employee satisfaction. Using this approach, we can infer whether managers consider the information contained in employee satisfaction and customer satisfaction to be important for predicting future profitability. A positive finding supports the case for the inclusion of these nonfinancial measures in the management reporting system to formalize the monitoring of information that may otherwise be obtained only in an ad hoc, qualitative, more costly, and potentially inconsistent manner.

For our overall sample the results suggest that only employee satisfaction is associated with future financial performance. But, when we examine the results separating two subsamples of stores on the basis of their competitive environment, we find that both employee satisfaction and customer satisfaction are associated with future store profits for stores in high-competition urban locations, but not for rural stores where competition is less severe. The results highlight the importance of understanding contextual factors that may affect the relationship between nonfinancial measures and financial performance.

Our results when we analyze managerial decisions indicate that information on both customer satisfaction and employee satisfaction is correlated with the store

closure decisions, but only customer satisfaction is correlated with performance evaluations of store managers.

This study contributes to the literature examining the role of nonfinancial measures in decision making and control systems within firms. First, it documents the importance of understanding the competitive environment of business units, which moderates the relationship between nonfinancial measures and financial performance. Second, it examines actual managerial decisions to investigate whether the information contained in nonfinancial metrics is reflected in these decisions. To our knowledge, this is the first study to pursue this approach of investigating the role of nonfinancial measures in decision making.

The remainder of this paper is organized as follows. Section 2 describes the theory that motivates our hypotheses. A description of the research site and our research design appears in section 3. The sample data and details of model specification are discussed in section 4. The empirical results of our analysis are presented in section 5. Section 6 describes tests carried out to examine the robustness of our results. Concluding remarks are presented in section 7.

2. Theory

Nonfinancial measures and financial performance

In a capital market context, policymakers have expressed concern that corporate financial reporting and disclosure has not kept pace with rapid changes in the business environment (American Institute of Certified Public Accountants [AICPA] Jenkins Committee, 1994). In consonance with these recommendations, researchers have provided evidence on the value-relevance of nonfinancial measures that reflect unrecognized assets (Amir and Lev 1996; Behn and Riley 1999; Lev and Sougiannis 1996). These studies have established that some nonfinancial measures are associated with future financial performance, although with mixed results. Similar arguments have been made espousing the importance of nonfinancial measures in internal decision making. The balanced scorecard (Kaplan and Norton 1992) approach emphasizes the reporting of measures that capture performance on four linked perspectives: (1) financial, (2) customer, (3) internal business processes, and (4) organizational learning. Employee satisfaction and customer satisfaction have often been espoused in the use of the balanced scorecard framework. In this paper we focus on the links between these two nonfinancial measures, employee satisfaction and customer satisfaction, and financial performance.

Organization theorists have argued that organizational effectiveness depends on the social structure of the organization, which can be measured by employee satisfaction and productivity of workers (Emery and Trist 1960). Other theorists have suggested that satisfied workers are productive workers (Likert 1961; McGregor 1960) because satisfied employees work harder and better than frustrated ones (Gross and Etzioni 1985), resulting in greater organizational effectiveness (Kopelman, Brief, and Guzzo 1990). Satisfied employees are more likely to engage in collaborative effort and accept organizational goals that increase productivity (Likert 1961; Roethlistberger 1959). Moreover, employees who help each other do not

have to go to supervisors for help, leaving the supervisors free to do more important things. Employee satisfaction also affects financial performance by reducing employee turnover because employee turnover increases transition and adjustment costs. Thus, the research literature suggests that improving employee satisfaction helps an organization improve financial performance.

A stream of literature has also examined the links between customer satisfaction and financial performance. Findings from this literature suggest that higher customer satisfaction implies lower marketing costs, less price elasticity, and higher customer loyalty, which in turn lead to improvements in financial performance (Reichheld and Sasser 1990; Fornell 1992). At the same time, improving customer satisfaction may entail certain costs, which necessitates focusing on overall economic consequences of increases in customer satisfaction. Several studies focus on understanding such economic outcomes of customer satisfaction (Anderson, Fornell, and Lehmann 1994; Anderson, Fornell, and Rust 1997; Rust and Zahorik 1993; Zeithaml, Berry, and Parasuraman 1996), and find that customer satisfaction has an impact on sales revenue, market share, and customers' intention to purchase behavior. Banker et al. (2000) use a panel of data from 18 properties of a hospitality firm and find that measures of customer satisfaction are significant predictors of future profitability. But Anderson et al. (1997) find that while customer satisfaction leads to improved productivity for manufacturing firms, there is a trade-off between satisfaction and productivity for service firms. Ittner and Larcker (1998a) find an insignificant or even a negative relationship between customer satisfaction and financial performance in many cases. In further tests they find some evidence of diminishing returns at higher levels of customer satisfaction. A potential explanation for finding such mixed results is that certain contextual variables may moderate the relationship between customer satisfaction and financial performance. Thus, it is important to identify moderating effects that influence this relationship before we include nonfinancial measures, such as customer satisfaction, in decision support or management control systems.

Our first hypothesis follows earlier studies that examine the relationship between nonfinancial measures and future financial performance without considering the partitioning of data based on the consideration of moderating variables:

HYPOTHESIS 1. *Employee satisfaction and customer satisfaction are positively associated with future financial performance.*

Competition as a moderating variable

Contingency theory postulates that the effectiveness of the organization depends on the congruence between elements of the organizational subsystem and the demands of the environment. For example, several studies (Hambrick 1983; McKee, Varadarajan, and Pride 1989; Snow and Hrebiniak 1980) find that the effectiveness of a particular strategic orientation is contingent on the dynamics of the market. This suggests that the links between satisfaction and performance at the business-unit level may also be moderated by conditions of the environment such as the level of competition.

At an individual level extant literature also suggests that moderating variables may affect the satisfaction-performance link (Katzell, Thompson, and Guzzo 1992). The field of social psychology frequently cites the work of Fishbein and Ajzen 1975, which is concerned with attitude formation, behavior intentions, and the prediction of overt behaviors. While customer satisfaction represents an attitude, it is different from intention to purchase, which is not the same as actual purchase behavior (Fishbein and Ajzen 1975; Granbois and Summers 1975; Taylor, Houlahan, and Gabriel 1975; Warshaw 1980). Actual purchase behavior of consumers is likely to be affected by the cost of moving to a new supplier. In markets with low levels of competition, there are fewer immediate alternatives available to customers. For instance, in the retail context, if a customer is dissatisfied with the only local department store in a rural location, the alternative may be to drive several miles to another store in a neighboring town. This makes it less likely that a dissatisfied customer will alter his or her purchase behavior. Under such conditions, we are not likely to see a strong linkage between customer satisfaction and revenues generated through actual purchase behavior. On the other hand, in urban areas, where there is substantial competition and a number of alternative suppliers are available to a consumer, it is less costly for a dissatisfied customer to find another supplier, and hence we would expect to see a stronger relationship between customer satisfaction and store profitability.

Similarly, industrial organization psychologists also draw theoretical distinctions between employee satisfaction, intention to quit, and actual turnover (Mobley 1977; Griffeth, Hom, and Gaertner 2000; Hom and Kinicki 2001). Thus, a disgruntled employee with a low satisfaction level may not quit his or her job because he or she does not have any other job opportunities.

Hence, the greater the competition, the stronger will be the relationship between customer satisfaction and business performance. Similarly, strong competition will lead to multiple employment choices for potential employees. Thus, alternative job opportunity may act as a moderating variable that influences the relationship between job satisfaction and turnover intentions of employees (Steers and Mowday 1981; Shikiar and Freudenberg 1982). Hence, the links between employee satisfaction and financial performance are also likely to be moderated by the level of competition.

The preceding discussion provides the basis for our second hypothesis concerning the relationship between nonfinancial measures and financial performance:

HYPOTHESIS 2. *In the presence of higher competition, there will be a stronger association between employee satisfaction, customer satisfaction, and financial performance.*

The association between nonfinancial measures and managerial decisions

If measurable indicators such as employee satisfaction and customer satisfaction are useful in predicting future earnings, they could be a valuable addition to the current reporting systems for senior managers who frequently need to make decisions that require the prediction of future earnings. We examine whether these

measurable indicators reflect the subjective impressions or specially gathered ad hoc information that senior managers rely on at present in making such decisions. We examine two such decisions: a one-time decision involving the selection of stores for closure and a recurring decision involving the evaluation of store managers' performance.

RETAILER management decided to close about 3 percent of its stores in year $t + 1$. Field interviews suggested that the selection of stores for closure was based on a variety of information. A senior manager remarked:

> In making the decision to close certain stores, our selection was based on the potential of stores to earn profits in the future. The past profit numbers were, of course, the major indicators of the ability of the store in earning profits in the future. But, in addition, we were also guided by several subjective criteria in arriving at this decision. The managers of stores that were not performing well were interviewed to obtain local insights into the potential for improved performance in the future. This information was corroborated by the regional managers responsible for the particular region in which the store is located. Past financial numbers were used along with this other information in making a final decision on which stores were to be closed.

At the time of making the decision to close certain stores, the senior managers had no access to a formal reporting system that measured and reported customer satisfaction and employee satisfaction. Considerable organizational effort and resources were expended to gather ad hoc information to support their decision.

If managers maximize expected future profits, then we can infer that they used information that they believe is relevant in predicting future profits. Much of the information available to them is subjective and not directly measurable. Therefore, we write the probability of store closure as a function of past profits and other subjective information:

$$\Pr(CLOSURE_{t+1}) = \mathrm{f}(PROFIT_t, PROFIT_{t-1}, \textit{other information}) \quad (1).$$

If stores deemed unprofitable in the long run were closed, then we can use our knowledge of which stores were closed to infer the information set relied on by the managers in predicting the stores' future earnings. In particular, we can evaluate whether employee satisfaction and customer satisfaction surrogate for some of the subjective impressions used by the managers in predicting future earnings that influence their store closure decision.[2] Therefore, we rewrite (1) as follows:

$$\Pr(CLOSURE_{t+1}) = \mathrm{f}(PROFIT_t, PROFIT_{t-1}, CUSTSAT_t, EMPLSAT_t) \quad (2).$$

Interviews with senior managers at RETAILER revealed that store managers were evaluated predominantly on the basis of store profits in the current year and changes in store revenue from the previous year to the current year. Subjective factors were also considered in evaluating store managers' performance. Commenting

on the performance evaluations of store managers, a senior manager in human resources remarked:

> While evaluating store managers we consider several dimensions of performance which may not be reflected in the financial numbers. Regional managers will often tour individual stores, talk to store employees and customers, obtain insights into managers' efforts in motivating employees to provide better service to customers, including improvements in the cleanliness of stores and display of merchandise. The regional manager's impressions are also considered for the annual exercise of evaluating store managers.

We are interested in examining whether employee satisfaction and customer satisfaction are correlated with some of the subjective factors used in the performance evaluations of managers (Hayes and Schaefer 2000). Hence, the probability of getting a higher performance rating can be written as a function of store profits, changes in sales revenue, and measures of employee satisfaction and customer satisfaction:

$$\Pr(PERFEVAL_{t+1}) = \mathrm{f}(PROFIT_t, \Delta REVENUE_t, CUSTSAT_t, EMPLSAT_t) \qquad (3).$$

Thus, our hypotheses regarding the associations between employee satisfaction, customer satisfaction, and managerial decisions regarding store closures and performance evaluation can be formally stated as follows:

HYPOTHESIS 3. *Lower levels of employee satisfaction and customer satisfaction will make it more likely that a particular store will be chosen for closure.*

HYPOTHESIS 4. *Higher levels of employee satisfaction and customer satisfaction will be associated with better performance evaluations of store managers.*

3. Research approach

Background of research site

We chose a large department store chain (hereafter referred to as RETAILER) for our study because (a) the firm had a large number of comparable stores, (b) the retail sector provides an ideal setting to study the impact of employee satisfaction and customer satisfaction on store performance, and (c) we had access to management in order to obtain the necessary data and insights. We analyze cross-sectional data for more than 800 stores. About 75 percent of the stores are located in urban areas while the remaining are in rural areas. Information deemed by RETAILER management to be competitively sensitive, including its identity, is disguised, and sample data are scaled by a scalar.

Traditional department stores such as RETAILER have faced increasing competition in recent years. The changed retail landscape has seen a customer shift

toward discount retailers like Wal-Mart and newer specialty chains such as Sharper Image. This has left traditional retailers, such as RETAILER, competing with each other for a shrinking base of customers. The competitive environment of the retail industry has forced traditional retailers to search for new strategies for survival and growth. In order to implement these strategies, RETAILER has had to reexamine its existing management control system.

Historically, RETAILER has relied on financial measures, such as store sales growth and operating profit, to evaluate and compensate store managers. In the past few years, many critical functions such as merchandising and advertising that influence store profit and have traditionally been under the control of the store manager have been centralized. These managers continue to be evaluated on the basis of sales and profit numbers, even though many of the revenue-generating functions are no longer under their control. Even so, store managers do have control over several aspects of local store management that influence long-run store revenue and profit. In the words of a general manager of human resources:

> Store managers can influence the number of employees, the proportion of part-time employees, the amount of on-the-job training provided to employees and general upkeep of the store. In addition they have limited control over the pay scales of employees within bounds specified by senior management. All these factors potentially affect the satisfaction levels of employees and customers which have implications for store profitability.

Senior management has signaled to store managers the need to enhance employee and customer satisfaction, which it thought might lead to higher revenue and profit. In implementing this new strategy with an emphasis on employees and customers, the management decided to measure customer satisfaction and employee satisfaction on an experimental basis. As a pilot exercise, the planning and research department hired an external agency in year *t* to carry out surveys of employee satisfaction and customer satisfaction.[3] The entire exercise of collecting survey responses from employees and customers covered a period of two months — that is, November and December of year *t*. But RETAILER has found it very difficult to convince most store managers to shift their emphasis to employee and customer satisfaction from the current reliance on only store sales and profit, without persuasive evidence of links between these measures and financial performance. In the words of one of the senior managers:

> In earlier days when sales were booming, the corporate message to the store managers was to sell, sell, sell. But with the changes in the last few years, we are unable to communicate our new strategy of customer orientation to the store managers.

A former store manager, now with the corporate office, had this to say:

> Since most of the revenue-generating functions are handled by the corporate office, store managers feel the only element which is controllable by them is

costs. They "save" cash by hiring a greater number of temps, but fail to see the effect these cost-cutting measures have on revenue. They are not convinced of the links between greater satisfaction of employees and customers, and greater revenue. As a result, they are reluctant to embrace a change in their compensation system to one based on new satisfaction measures.

Moreover, because the measurement of employee satisfaction and customer satisfaction scores had only recently been introduced at RETAILER, many managers were skeptical of their use in decision making.

The association between nonfinancial measures and future earnings

In this study we examine whether the relationships between nonfinancial measures and financial performance are contingent on the competitive environment and location of business units (that is, retail stores). In the first part of this study we develop a model based on research examining the time-series properties of annual earnings (Watts 1970; Ball and Watts 1972; Watts and Leftwich 1977). Several studies have documented that earnings in year t is the best predictor of earnings in year $t + 1$. For firms in growth mode, Mozes (1992) finds that past and future earnings growth is positively correlated. The recurring forces that affect a change in income momentum (Ijiri 1982, 1989) from year $t - 1$ to year t continue to produce income changes from year t to year $t + 1$. This implies that income in year $t - 1$ may also have information content to predict income in year $t + 1$. Employee satisfaction and customer satisfaction are potentially lead indicators of future profits. Therefore, we include these satisfaction measures in (4), below, as predictors of profit in the three years ($t + k$, $k = 1, 2, 3$) after the survey was conducted. Thus, the following model in (4) describes the relationships to predict future profits one, two, and three years out based on current and recent profits, employee satisfaction, and customer satisfaction:

$$PROFIT_{t+k} = \alpha_0 + \alpha_1 PROFIT_t + \alpha_2 PROFIT_{t-1} + \alpha_3 CUSTSAT_t + \alpha_4 EMPLSAT_t + \epsilon_{t+k} \text{ for } k = 1, 2, 3 \quad (4).$$

The right-hand side of (4) represents information available at the end of year t for predicting profits in years $t + 1$, $t + 2$, and $t + 3$. This information includes past profits in years t and $t - 1$ as well as customer satisfaction and employee satisfaction, which were both measured during year t. This model allows us to examine the incremental information content of the nonfinancial measures to predict future earnings after controlling for past earnings.

We expect significant differences in the associations between the variables used in our model for the urban and rural stores largely because of the differences in the nature of competition in urban and rural areas. Senior managers indicated that because of the higher median income, proportion of white collar workers, proportion of college-educated population, and intensity of competition, it was more important for employees to provide excellent customer service in the urban stores than in rural stores (Banker, Lee, Potter, and Srinivasan 1996). RETAILER's urban

stores are located in malls where other competing department stores are also located. On the other hand, the rural stores are stand-alone stores that do not have direct competitors in close proximity. Also, urban areas have more alternative shopping destinations than are available in rural areas. Thus, the nature and intensity of competition is different across the urban and rural stores. These differences in competition may affect the sensitivity of store profitability to employee satisfaction and customer satisfaction. Although employees or customers in rural areas may not be entirely satisfied with their local RETAILER store, the relative absence of competition may preclude them from choosing a competitor in a more distant location over RETAILER. We refer to the subsample of high-competition urban stores as HI_COMP stores and the subsample of low-competition rural stores as LO_COMP stores.[4]

In our second approach to test the ability of nonfinancial measures to predict future profits, we examine the ability of the employee satisfaction and customer satisfaction measures to explain store closures after controlling for past earnings information available to managers. We specify three alternative specifications of a logit prediction model to examine the impact of the employee satisfaction and customer satisfaction measures, after controlling for profits in years t and $t - 1$, on the probability of store closures:

Model A:

$$\Pr(CLOSURE_{t+1} = 1) = \mathrm{f}(NPROFIT_t, NPROFIT_{t-1}) \quad (5),$$

Model B:

$$\Pr(CLOSURE_{t+1} = 1) = \mathrm{f}(NPROFIT_t, NPROFIT_{t-1}, CUSTSAT, EMPLSAT) \quad (6),$$

where $CLOSURE_{t+1} = 1$ if the store is selected for closure, and 0 if it is not; $\mathrm{f}(x) = e^{\beta' x}/(1 + e^{\beta' x})$; x represents the vector of explanatory variables, and β represents the vector of estimated coefficients of explanatory variables; and $NPROFIT_{t,t-1}$ = profit per square foot in years t and $t - 1$, respectively.

We also examine the role of both employee satisfaction and customer satisfaction in explaining actual performance evaluations of store managers. Discussions with senior management revealed that the performance of store managers was evaluated on the basis of profit per square foot, increases in revenue per square foot, and other subjective factors. The evaluations were done on a scale of 1 to 4, with 1 indicating high and 4 indicating low performance. Using an ordered cumulative logit model (McCullagh 1980), we specify two alternative specifications of the prediction model to examine whether the nonfinancial measures capture some of the additional subjective information used in the performance evaluations of the store managers.

Model A:

$$\Pr(PERFEVAL_{t+1} \leq j) = \mathrm{F}(NPROFIT_t, \Delta NREVENUE_t) \quad (7),$$

Model B:

$$\Pr(PERFEVAL_{t+1} \leq j) = \mathrm{F}(NPROFIT_t, CUSTSAT_t, \mathrm{EMPLSAT}_t) \quad (8),$$

Model C:

$$\Pr(PERFEVAL_{t+1} \leq j) = \mathrm{F}(NPROFIT_t, \Delta NREVENUE_t, CUSTSAT_t, EMPLSAT_t) \quad (9),$$

where

$$F_{ij} = \sum_{m=1}^{j} p_{im}$$

is the cumulative probability that individual i has an evaluation of j or lower; $\log(F_{ij}/(1 - F_{ij})) = \alpha_j + \beta_{xi}, j = 1, \ldots, 4$ and $\beta_{xi} = \beta_1 x_{i1} + \ldots + \beta_k x_{ik}$; and $\Delta NREVENUE_t$ = change in revenue per square foot of the store from year $t - 1$ to year t.

The cumulative logit model specifies a common set of coefficients but allows a different intercept term for each of the equations, making it easy to interpret the coefficients. Each of the variables in (7), (8), and (9) are interacted with *HICOMP* and *LOCOMP* indicator variables, where $HICOMP = 1$ if the store is located in a HI_COMP location, and 0 otherwise; $LOCOMP = 1$ if the store is located in a LO_COMP location, and 0 otherwise.

4. Data collection and empirical models

Data collection

We collected the data for this study from several sources within RETAILER. Because the financial performance measures currently used by RETAILER include operating profit and revenue numbers, we collected these data from corporate accounting records, which include the annual operating data of individual stores for five years: $t + 3$, $t + 2$, $t + 1$, t, and $t - 1$ (the actual year of the satisfaction surveys is disguised by the symbol t). Operating profit (*PROFIT*) is computed as revenue less cost based on generally accepted accounting principles (GAAP) for each store. Thus, revenue is annual store sales net of markdowns, shrinkage, and other discounts. Costs include cost of goods sold (including freight costs); salaries and wages of store personnel; occupancy costs; and allocated corporate overhead for advertising, management salaries and benefits, taxes, and other administration costs. Most corporate allocations are made on the basis of store revenue. We denote the normalized value of operating profit per square foot as *NPROFIT*. All sample data used in this paper are multiplied by a scalar as required by RETAILER to preserve the confidentiality of sensitive information.

RETAILER had hired an external agency to measure customer satisfaction scores on an individual store basis during the period beginning in November and ending in December of year $t - 1$. This exercise was extended in year t to measuring

employee satisfaction and using an enhanced customer survey with additional questions. Since then RETAILER has discontinued the surveys because senior management was involved with the more exigent task of dealing with short-term financial distress.[5] Hence, survey data for employee satisfaction are available for only one fiscal year, t, and for one additional year for customer satisfaction.

Customer satisfaction ($CUSTSAT_t$)

The external agency conducted the survey of customer satisfaction for individual stores with a direct mailing to each store's customers. Customers were selected on the basis of recency and frequency of their visits and the amount of money they spent during the 12 months prior to the survey. The surveys contained responses to four questions that measure overall customer satisfaction for a particular store on a 10-point scale. Principal component analysis of the responses (reported in the Appendix) revealed that all four questions loaded on a single factor (Cronbach's alpha = 0.9107). We compute factor scores for each individual survey response based on the factor loadings for each question, and use the standardized factor scores as our measure of customer satisfaction, $CUSTSAT_t$.

Employee satisfaction ($EMPLSAT_t$)

The survey conducted by the external agency to assess the satisfaction levels of sales associates (excluding managerial staff) across stores contained three questions. Principal component analysis of the responses of store associates to these questions (reported in the Appendix) revealed that they loaded on a single factor (Cronbach's alpha = 0.8694). Again, we compute factor scores on the basis of loadings of each question on the common factor and use the standardized factor scores as our measure of employee satisfaction, $EMPLSAT_t$.

Model specification

Because comparable data for the nonfinancial measures of employee satisfaction and customer satisfaction are available for only one fiscal year, we employ a cross-sectional approach in specifying our models. In the direct approach we model the relationship between future profits (in years $t + 1$, $t + 2$, and $t + 3$) and the nonfinancial measures of employee satisfaction and customer satisfaction, controlling for the information content of current and past earnings. In addition we control for information content of prior earnings because the literature has shown that earnings in years t and $t - 1$ are informative in predicting earnings in years $t + 1$, $t + 2$, and $t + 3$. The employee satisfaction and customer satisfaction scores represent other direct measures of forces that drive changes in income.

For our cross-sectional analysis, we modify (4) by considering the normalized profit per square foot for each store. Our model allows us to test the incremental ability of employee satisfaction and customer satisfaction to predict future profits after controlling for information already contained in the earnings time series. To examine whether these relationships are moderated by competition, we introduce dummy variables interacted with each of the profit drivers in (4) to capture whether a store belongs to the HI_COMP subsample or the LO_COMP subsample.[6]

$$NPROFIT_{t+k} = \beta_1 HICOMP + \beta_2 LOCOMP + \beta_3(NPROFIT_t{*}HICOMP) + \beta_4(NPROFIT_t{*}LOCOMP) + \beta_5(NPROFIT_{t-1}{*}HICOMP) + \beta_6(NPROFIT_{t-1}{*}LOCOMP) + \beta_7(CUSTSAT_t{*}HICOMP) + \beta_8(CUSTSAT_t{*}LOCOMP) + \beta_9(EMPLSAT_t{*}HICOMP) + \beta_{10}(EMPLSAT_t{*}LOCOMP) + \epsilon_k \quad (10),$$

where $k = 1, 2, 3$.

On the basis of Hypothesis 2, we expect $\beta_7 > \beta_8$ and $\beta_9 > \beta_{10}$.

5. Empirical results

Descriptive statistics and econometric considerations

Table 1 presents correlations between variables included in our empirical analyses. These correlations are based on data from the full sample of stores. As expected, the *NPROFIT* variables are positively and significantly correlated for all years. While employee satisfaction is significantly positively correlated with profit per square foot in each of the years, the correlation between customer satisfaction and profit per square foot is, in most cases, not significant. The correlation coefficient between employee satisfaction and customer satisfaction, though statistically significant, is only about 0.13.

Descriptive statistics of the data used in the analyses are presented in Table 2. Stores in the LO_COMP subsample, on average, have a higher profit per square foot than those in the HI_COMP subsample. This reflects the lower intensity of competition for stores located in rural areas than for their urban counterparts. Also, stores in the HI_COMP subsample have a significantly higher mean customer satisfaction score and lower mean employee satisfaction score than stores in the LO_COMP subsample. This is consistent with greater choice to customers in the urban locations resulting in better service to them and the high pressure of satisfying customers leading to lower employee satisfaction.

After normalizing operating profit by the size of the store in square feet, White's 1980 test confirmed that the homoskedasticity assumption is not violated in any of our estimation models. Results from the Davidson and McKinnon 1985 test showed that the linear specification was preferred over the loglinear specification in (10). As a robustness check we reestimated the regressions using the loglinear specification with no significant difference in the results (results not reported). We used Belsley, Kuh, and Welsch's 1980 criteria to identify influential observations that drive the results. No such observations were found. We used condition indices (Belsley, Kuh, and Welsch 1980) to assess multicollinearity. The value of the condition index depends on the correlation among the variables. If the regressors are orthogonal, then the condition index is 1. A collinearity problem occurs when a component associated with a high condition index contributes strongly to the variance of two or more variables. The condition indices for our main model ranged from 1 to 11.09, all below the recommended maximum of 20 (Belsley, Kuh, and Welsch 1980), indicating that multicollinearity is not a problem for our estimation models. The Shapiro-Wilk 1965 test confirmed that residuals for all of the equations do not violate the normality assumption.

TABLE 1
Correlation matrix

	$NPROFIT_{t+3}$	$NPROFIT_{t+2}$	$NPROFIT_{t+1}$	$NPROFIT_{t}$	$NPROFIT_{t-1}$	$CUSTSAT_{t}$	$EMPLSAT_{t}$
$NPROFIT_{t+3}$		0.8873*	0.8369*	0.7673*	0.7163*	0.0250	0.0910*
$NPROFIT_{t+2}$	0.8715*		0.8885*	0.8141*	0.7436*	0.0193	0.1420*
$NPROFIT_{t+1}$	0.8151*	0.8798*		0.8982*	0.8331*	0.0374	0.1550*
$NPROFIT_{t}$	0.7349*	0.7800*	0.8680*		0.9067*	0.0274	0.1062*
$NPROFIT_{t-1}$	0.6806*	0.7022*	0.8011*	0.9047*		0.0456	0.0914*
$CUSTSAT_{t}$	0.0528	0.0567	0.0504	0.0386	0.0589‡		0.1312*
$EMPLSAT_{t}$	0.1295*	0.1778*	0.1432*	0.0932*	0.0850†	0.1247*	

Notes:

Pearson correlations are above the diagonal; Spearman correlations are below the diagonal.

$NPROFIT_{t+k}$ Annual profit per square foot of a store in year $t + k$.

$CUSTSAT_{t}$ Standardized factor scores using questions from customer survey.

$EMPLSAT_{t}$ Standardized factor scores using questions from employee survey.

* Significant at the 0.01 level (two-tailed).

† Significant at the 0.05 level (two-tailed).

‡ Significant at the 0.10 level (two-tailed).

TABLE 2
Descriptive statistics

	Full sample			HI_COMP subsample			LO_COMP subsample		
Variable	Mean	s.d.	Median	Mean	s.d.	Median	Mean	s.d.	Median
$NPROFIT_{t+3}$	11.95	9.62	11.18	10.62	8.97	10.26	16.81	10.35	16.48
$NPROFIT_{t+2}$	6.49	9.10	5.88	5.16	8.66	4.68	11.30	9.07	10.52
$NPROFIT_{t+1}$	11.89	9.81	11.11	10.46	9.26	9.75	17.13	10.04	16.39
$NPROFIT_{t}$	10.91	9.51	10.54	9.87	9.13	9.62	14.70	9.92	14.33
$NPROFIT_{t-1}$	13.85	10.24	13.55	12.83	9.93	12.55	17.56	10.54	16.49
$CUSTSAT_{t}$	0.00	1.00	0.00	0.28	0.76	0.34	−0.51	1.17	−0.40
$EMPLSAT_{t}$	0.00	1.00	0.00	−0.08	0.97	0.02	0.30	1.06	0.40

Notes:

$NPROFIT_{t+k}$ Annual profit per square foot of a store in year $t + k$.

$CUSTSAT_{t}$ Standardized factor scores using questions from customer survey.

$EMPLSAT_{t}$ Standardized factor scores using questions from employee survey.

The standardized factor scores, $CUSTSAT_t$ and $EMPLSAT_t$, are computed using the full sample. Hence, the mean scores on each factor across the full sample is zero with a standard deviation of 1. The mean values of the HI_COMP and LO_COMP subsamples presented in Table 2 can be interpreted as the number of standard deviations (where the standard deviation is calculated on the full sample) from the overall sample mean. For example, a mean $CUSTSAT_t$ of 0.28 for the HI_COMP subsample denotes a mean that is 0.28 standard deviations higher than the mean of the full sample. Similarly, the mean $EMPLSAT_t$ of −0.08 for the HI_COMP subsample denotes a mean that is 0.08 standard deviations lower than the mean of the full sample.

Results

Results from estimating (2) for the overall sample using $NPROFIT_{t+1}$, $NPROFIT_{t+2}$, and $NPROFIT_{t+3}$ as dependent variables are presented in Table 3. The estimation results indicate that operating profit in year t is a significant predictor of future operating profit in years $t + 1$, $t + 2$, and $t + 3$. This result is consistent with the findings of persistence in the earnings time-series literature. In addition, the coefficients on operating profit in year $t - 1$ are also positive and significant for predicting operating profits in years $t + 1$ and $t + 3$ ($\hat{\beta}_2 = 0.0989$ and 0.1240; $p = 0.0025$ and 0.0057, respectively). Although the evidence is not strong enough to support the impact of customer satisfaction for predicting future operating profits, the coefficient on employee satisfaction is significant in each of years $t + 1$, $t + 2$, and $t + 3$. The joint F-test rejects the null hypothesis that coefficients on both nonfinancial measures are equal to zero in (7), indicating that the nonfinancial measures do have incremental information content for predicting future earnings after controlling for past earnings information (Bowen, Burgstahler, and Daley 1987; Biddle, Seow, and Siegel 1995).

In Table 4 we present the results of our main model that examines the differences in the effects of the nonfinancial variables across HI_COMP and LO_COMP stores. For all three years, the coefficients on the interaction of customer satisfaction with *HICOMP* are significantly positive ($\hat{\beta}_7 = 0.6748$, 0.7164, and 1.1482; $p = 0.0044$, 0.0096, and 0.0007 for years $t + 1$, $t + 2$, and $t + 3$, respectively). The same result holds for the coefficients on the interaction between employee satisfaction and *HICOMP*, although they are significant only at the 5 percent level in years $t + 1$ and $t + 3$ ($\hat{\beta}_9 = 0.3461$, 0.7038, and 0.4909; $p = 0.0344$, 0.0009, and 0.0321 for years $t + 1$, $t + 2$, and $t + 3$, respectively). On the other hand, all interactions of the satisfaction variables with *LOCOMP* are insignificant. This suggests that higher employee satisfaction and customer satisfaction lead to increases in profit for urban stores but not for rural stores. The economic significance of these results can be evaluated by considering the first column of Table 4 (dependent variable $NPROFIT_{t+1}$) for HI_COMP stores. Moving from the first quartile of customer satisfaction to the third quartile will improve profit per square foot by about 5.5 percent in year $t + 1$. On the other hand, moving from the first quartile of employee satisfaction to the third quartile will only improve profit per square foot by about 4 percent. The results of the joint F-test suggest that there is a statistically significant difference in the effects of customer satisfaction and employee satisfaction on future store profits. This implies that the nonfinancial measures contain incremental information content for predicting future earnings only for urban stores.

These results suggest that both employee satisfaction and customer satisfaction have the incremental ability to predict future store profits, after controlling for information in past profits. But this ability is contingent on the HI_COMP or LO_COMP location of the store. This finding provides a critical consideration for RETAILER management in incorporating these nonfinancial measures in the management reporting system. Although emphasizing nonfinancial measures in HI_COMP locations is likely to lead to better financial performance, doing so in LO_COMP locations is unlikely to have any impact on financial performance.

TABLE 3
Regressions examining the information content of nonfinancial measures in predicting store profits per square foot (p-values in parentheses)

$$NPROFIT_{t+k} = \beta_0 HICOMP + \beta_1 NPROFIT_t + \beta_2 NPROFIT_{t-1} + \beta_3 CUSTSAT_t + \beta_4 EMPLSAT_t + \epsilon_k \quad \text{where } k = 1, 2, 3$$

		Dependent variable			
Independent variable	Predicted sign	$NPROFIT_{t+1}$	$NPROFIT_{t+2}$	$NPROFIT_{t+3}$	$\sum_{t+1}^{t+3} NPROFIT$
Intercept		1.5650*	−2.1406*	2.9859*	2.4104*
		(<0.0001)	(<0.0001)	(8.03)	(0.0019)
$NPROFIT_t$	+	0.9213*	0.7421*	0.6544*	2.2190*
		(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)
$NPROFIT_{t-1}$	+	0.0989*	0.0363	0.1240*	0.2592*
		(0.0025)	(0.1914)	(0.0057)	(0.0087)
$CUSTSAT_t$	+	−0.1134	0.0362	0.4175‡	0.3403
		(0.7109)	(0.4404)	(0.0706)	(0.2956)
$EMPLSAT_t$	+	0.4322*	0.6899*	0.4970†	1.6191*
		(0.0041)	(0.0002)	(0.0144)	(0.0008)
R^2		0.7992	0.6720	0.5960	0.7494
F-test§		3.55†	6.51*	3.87†	5.48*
		(0.0293)	(0.0016)	(0.0213)	(0.0022)

(The table is continued on the next page.)

TABLE 3 (Continued)

Notes:

Variables are as defined in Table 1.

* Significant at the 0.01 level (one-tailed).

† Significant at the 0.05 level (one-tailed).

‡ Significant at the 0.10 level (one-tailed).

§ F-test of joint null hypothesis: $\beta_3 = \beta_4 = 0$ (equation 8).

Results from estimating the logit model used to predict store closures in urban locations are presented in Table 5. We present the results for the two alternative specifications described in models A and B. For model B, store profit in year t has a significant impact ($\hat{\beta} = -0.1689$, $p = 0.0056$) on the probability that a store was selected for closure. The coefficients of both employee satisfaction ($\hat{\beta} = -0.5664$, $p = 0.0035$) and customer satisfaction are significant ($\hat{\beta} = -0.7057$, $p = 0.0164$) and in the expected direction. The results indicate that higher customer satisfaction and employee satisfaction scores reduce the probability that a store was selected for closure.

To compare the different model specifications, Judge, Hill, Griffiths, Lütkepohl, and Lee (1988) and Greene (1997) suggest a likelihood ratio-based pseudo-R^2 measure of goodness of fit for the logit model. The addition of customer satisfaction and employee satisfaction variables to the model increases the pseudo-R^2 from 0.2525 to 0.3337. The importance of these nonfinancial measures in the store closure decisions is consistent with findings from our direct approach that they are significant lead indicators of future earnings.

The results from the estimation of the cumulative logit model using the performance evaluations of store managers in the HI_COMP subsample are presented in Table 6. As expected, profit per square foot has a significant positive impact on the probability that a store manager gets a better performance evaluation. The coefficient of the interaction of customer satisfaction with *HICOMP* in models B and C is highly significant ($\hat{\beta} = 0.3806$ and 0.3849, $p = 0.0018$ and 0.0017, respectively). The coefficient interacted with *LOCOMP* is insignificant. This result suggests that managers do take into consideration the differences in the effect of customer satisfaction on future financial performance while making their performance evaluations. The addition of customer satisfaction, employee satisfaction, and their interaction terms to the model increases the pseudo-R^2 from 0.0312 to 0.0427. An unexpected result is the coefficient of employee satisfaction, which is not significant when interacted with *HICOMP* ($\hat{\beta} = -0.2383$, $p = 0.9817$), but marginally significant when interacted with *LOCOMP* ($\hat{\beta} = 0.4279$, $p = 0.0619$). Although we cannot easily explain why employee satisfaction is insignificant for HI_COMP stores in the performance evaluation model but significant in the store closure model, discussion of our findings with RETAILER management revealed a possible explanation. Because the store closure decision is an important one-time decision, the breadth of input and depth of analysis was far greater than routine

TABLE 4
Regressions examining the information content of nonfinancial measures in predicting store profits per square foot using competition as a moderating variable (p-values in parentheses)

$$NPROFIT_{t+k} = \beta_1 HICOMP + \beta_2 LOCOMP + \beta_3(NPROFIT_t{*}HICOMP) + \beta_4(NPROFIT_t{*}LOCOMP) + \beta_5(NPROFIT_{t-1}{*}HICOMP) + \beta_6(NPROFIT_{t-1}{*}LOCOMP) + \beta_7(CUSTSAT_t{*}HICOMP) + \beta_8(CUSTSAT_t{*}LOCOMP) + \beta_9(EMPLSAT_t{*}HICOMP) + \beta_{10}(EMPLSAT_t{*}LOCOMP) + \epsilon_k \quad \text{where } k = 1, 2, 3$$

$HICOMP = 1$ if store is located in HI_COMP location, and 0 otherwise;
$LOCOMP = 1$ if store is located in LO_COMP location, and 0 otherwise.

		Dependent variable			
Independent variable	Predicted sign	$NPROFIT_{t+1}$	$NPROFIT_{t+2}$	$NPROFIT_{t+3}$	$\sum_{t+1}^{t+3} NPROFIT$
HICOMP	?	1.2447*	−2.3312*	2.9073*	1.8208†
		(<0.0001)	(<0.0001)	(<0.0001)	(0.0218)
LOCOMP	?	2.8614*	−0.9473	3.7302*	5.6444*
		(<0.0001)	(0.2271)	(<0.0001)	(0.0029)
$NPROFIT_t$*HICOMP*	+	0.7973*	0.7343*	0.6157*	2.1473*
		(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)
$NPROFIT_t$*LOCOMP*	+	0.8210*	0.6321*	0.6370*	2.0901*
		(<0.0001)	(<0.0001)	(<0.0001)	(<0.0001)
$NPROFIT_{t-1}$*HICOMP*	+	0.0873†	0.0026	0.0976†	0.1875‡
		(0.0117)	(0.4776)	(0.0345)	(0.0576)
$NPROFIT_{t-1}$*LOCOMP*	+	0.1210‡	0.1735†	0.2269†	0.5215†
		(0.0592)	(0.0299)	(0.0180)	(0.0149)

(The table is continued on the next page.)

TABLE 4 (Continued)

Independent variable	Predicted sign	Dependent variable: $NPROFIT_{t+1}$	$NPROFIT_{t+2}$	$NPROFIT_{t+3}$	$\sum_{t+1}^{t+3} NPROFIT$
$CUSTSAT_t$*$HICOMP$	+	0.6748*	0.7164*	1.1482*	2.5394*
		(0.0044)	(0.0096)	(0.0007)	(0.0007)
$CUSTSAT_t$*$LOCOMP$	+	−0.4233	0.0924	0.6161	0.2852
		(0.8667)	(0.4192)	(0.1230)	(0.4043)
$EMPLSAT_t$*$HICOMP$	+	0.3461†	0.7038*	0.4909†	1.5409*
		(0.0344)	(0.0009)	(0.0321)	(0.0045)
$EMPLSAT_t$*$LOCOMP$	+	−0.0904	−0.2267	−0.3692	−0.6862
		(0.6102)	(0.7225)	(0.7938)	(0.7540)
R^2		0.9232	0.7930	0.8491	0.8952
F-test§		4.00*	3.23†	1.93‡	3.60†
		(0.0094)	(0.0201)	(0.0732)	(0.0139)

Notes:

Variables are as defined in Table 1.

* Significant at the 0.01 level (one-tailed).

† Significant at the 0.05 level (one-tailed).

‡ Significant at the 0.10 level (one-tailed).

§ F-test of joint null hypothesis: $\beta_7 = \beta_8$, $\beta_9 = \beta_{10}$ (equation 8).

decisions such as performance evaluations. In the absence of formal reporting of the nonfinancial measures, senior management must rely only on alternative subjective evaluations of drivers of future performance.

The results from this indirect approach suggest that managers making decisions such as store closures and performance evaluations rely on information correlated with customer satisfaction and employee satisfaction in addition to financial measures of store performance. Thus, the implication for RETAILER senior management is that these satisfaction measures provide an objective way of quantifying subjective information currently used in making decisions that require the projection of future profits and hence make a case for formalizing the reporting of these measures in executive information systems.

TABLE 5
Logit model for predicting store closures in HI_COMP subsample

Model A:

$\Pr(CLOSURE_{t+1} = 1) = f(NPROFIT_t, NPROFIT_{t-1})$

Model B:

$\Pr(CLOSURE_{t+1} = 1) = f(NPROFIT_t, NPROFIT_{t-1}, CUSTSAT, EMPLSAT)$

where $CLOSURE_{t+1} = 1$ if the store is selected for closure, and 0 if it is not; $f(x) = e^{\beta' x}/(1 + e^{\beta' x})$; x represents the vector of explanatory variables, and β represents the vector of estimated coefficients of explanatory variables.

Independent variable	Predicted sign	Model A	Model B
Intercept		−2.9725*	−3.3106*
		(<0.0001)	(<0.0001)
$NPROFIT_t$	−	−0.1889*	−0.1689*
		(0.0009)	(0.0056)
$NPROFIT_{t-1}$	−	−0.0074	−0.0018
		(0.4382)	(0.9732)
$CUSTSAT_t$	−		−0.7057†
			(0.0164)
$EMPLSAT_t$	−		−0.5664*
			(0.0035)
Pseudo-R^2		0.2525	0.3337

Notes:

Figures in parentheses are *p*-values calculated using chi-square statistics from the Wald test.

Variables are as defined in Table 1.

* Significant at the 0.01 level (one-tailed).

† Significant at the 0.05 level (one-tailed).

TABLE 6
Ordered cumulative logit model to predict performance evaluations

Model A:

$\Pr(PERFEVAL_{t+1} \leq j) = f(NPROFIT_t, \Delta NREVENUE_t)$

Model B:

$\Pr(PERFEVAL_{t+1} \leq j) = f(NPROFIT_t, CUSTSAT_t, EMPLSAT_t)$

Model C:

$\Pr(PERFEVAL_{t+1} \leq j) = f(NPROFIT_t, \Delta NREVENUE_t, CUSTSAT_t, EMPLSAT_t)$

where

$$F_{ij} = \sum_{m=1}^{j} p_{im}$$

is the probability that individual i has an evaluation of j or lower; $\log(F_{ij}/(1 - F_{ij})) = \alpha_j + \beta_{xi}$, $j = 1, \ldots, 4$ and $\beta_{xi} = \beta_1 x_{i1} + \ldots + \beta_k x_{ik}$.

Independent variable	Predicted sign	Model A	Model B	Model C
Intercept 1		−3.9192*	−4.0687*	−4.1282*
		(<0.0001)	(<0.0001)	(<0.0001)*
Intercept 2		−0.1620	−0.2817	−0.3075
		(0.5853)	(0.3650)	(0.3309)
Intercept 3		2.9856*	2.8817*	2.8675*
		(<0.0001)	(<0.0001)	(<0.0001)
HICOMP	?	1.0984*	1.0493*	1.1213*
		(0.0007)	(0.0019)	(0.0011)
$NPROFIT_t$*HICOMP	+	0.0372*	0.0327*	0.0377*
		(<0.0001)	(0.0003)	(<0.0001)
$NPROFIT_t$*LOCOMP	+	0.0508*	0.0558*	0.0560*
		(0.0019)	(0.0008)	(0.0008)
$\Delta NREVENUE_t$*HICOMP	+	0.0135*		0.0147*
		(0.0023)		(0.0011)
$\Delta NREVENUE_t$*LOCOMP	+	−0.0095		−0.0084
		(0.7784)		(0.7444)
$CUSTSAT_t$*HICOMP	+		0.3806*	0.3849*
			(0.0018)	(0.0017)
$CUSTSAT_t$*LOCOMP	+		−0.0324	−0.0027
			(0.5644)	(0.5053)
$EMPLSAT_t$*HICOMP	+		−0.2014	−0.2383
			(0.9817)	(0.9928)

(The table is continued on the next page.)

TABLE 6 (Continued)

Independent variable	Predicted sign	Model A	Model B	Model C
$EMPLSAT_t$*$LOCOMP$	+		0.2573†	0.2479†
			(0.0540)	(0.0619)
Pseudo-R^2		0.0312	0.0342	0.0427

Notes:

Each of the variables are interacted with *HICOMP* and *LOCOMP* indicator variables, where
HICOMP = 1 if store is located in HI_COMP location, and 0 otherwise;
LOCOMP = 1 if store is located in LO_COMP location, and 0 otherwise.

Figures in parentheses are *p*-values calculated using chi-square statistics from the Wald test.

Variables are as defined in Table 1.

* Significant at the 0.01 level (one-tailed).

† Significant at the 0.10 level (one-tailed).

6. Robustness checks

We conduct several robustness tests using alternative models and variable specifications. To test the robustness of our measures of customer satisfaction and employee satisfaction, we estimated (10) using alternative measures (results not reported). One alternative measure we used was the average response to all the questions instead of using the factor scores. The results were similar to those obtained using the factor scores. As another alternative measure, we used the response to the overall question on the customer and employee surveys (questions 4 and 3 respectively in the Appendix). Again, the results were similar to those obtained earlier. The correlations between the alternative measures are greater than 0.9 in each case, which explains the nearly identical results.

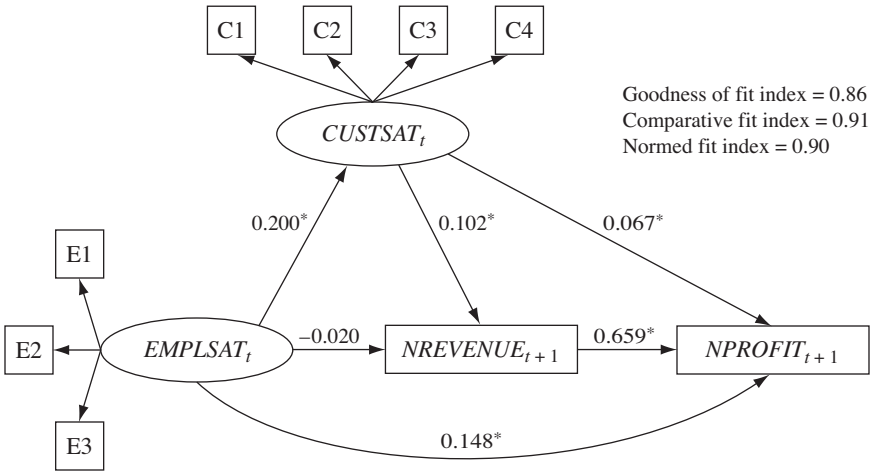
While employee satisfaction may have a direct linkage with firm performance, it may also have indirect linkages through intervening variables such as customer satisfaction. Work done by Schneider, Goldstein, and Smith 1995 argues that employee satisfaction should be correlated with customer satisfaction because front-line employees are in positions to be aware of and responsive to organizational and customer goals. Employee attitudes and customer perceptions of service quality, in turn, have been shown to be conditionally related to the profitability of an organization by various researchers (see Schneider 1991 for a review; also see Johnson, Ryan, and Schmit 1994). A more practitioner-oriented rationale for the indirect link between employee satisfaction and organization performance has been presented in the "service profit chain" (Heskett, Jones, Loveman, Sasser, and Schlesinger 1994). This concept espouses that motivated employees are more productive and serve customers better, who will in turn buy more products of the firm, leading to improved financial performance. This suggests that customer satisfaction may act as a mediating variable in the relationship between employee satisfaction and future profitability. We use structural equation modeling using the linear

equations model (Bentler and Weeks 1980) to design a path model that examines the direct effect of employee satisfaction on future profitability, as well as its indirect effect through customer satisfaction. Additionally, we have argued that the hypothesized effects of customer satisfaction and employee satisfaction on future profitability take place through their impact on store revenue. We incorporate store revenue as an intermediary variable in the path model to examine whether the nonfinancial variables impact store profitability through their effect on store revenue. The nonfinancial measures are modeled as latent variables. Employee satisfaction is a latent exogenous variable that has three indicator variables E1, E2, and E3 measured by employee responses to questions on employee survey. Similarly, customer satisfaction is a latent variable measured by indicators C1, C2, C3, and C4 (see Appendix). The path diagrams depicting these relationships for the HI_COMP and LO_COMP subsamples are presented in panels A and B of Figure 1, respectively. All endogenous variables have residual terms (not shown in the path diagrams). As in our main model, profit per square foot in period $t + 1$ is endogenously determined by the nonfinancial measures as well as revenue per square foot in period $t + 1$. To examine whether customer satisfaction acts as a mediating variable, we allow employee satisfaction to have both direct and indirect effects on profit. This path model is estimated separately for the HI_COMP and LO_COMP subsamples. The resulting model for the HI_COMP subsample shown in panel A of Figure 1 presents a good fit to the data (goodness of fit index = 0.86; comparative fit index = 0.91; normed fit index = 0.90). The results suggest that employee satisfaction has both direct as well as indirect effects on store profits. The indirect effect of employee satisfaction takes place through its effect on customer satisfaction ($\hat{\beta} = 0.200$, $p < 0.0001$), which has a positive relationship with revenue per square foot ($\hat{\beta} = 0.102$, $p < 0.0001$) and in turn impacts profit per square foot ($\hat{\beta} = 0.659$, $p < 0.0001$). None of the hypothesized relationships are significant for the LO_COMP subsample as seen in panel B of Figure 1. This is consistent with the findings of our main model.

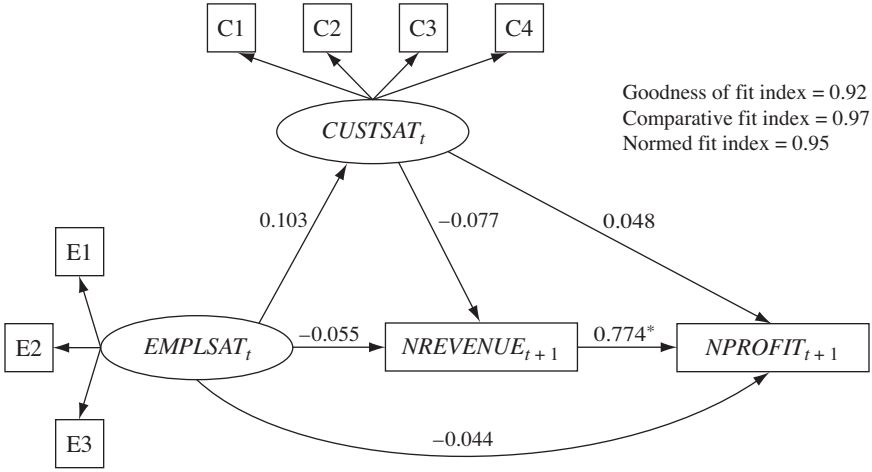
Because we use past profits as a control variable in our empirical models, the impact of most omitted correlated variables that do not change much across periods will be attenuated in our cross-sectional analyses. For example, the demographic patterns and spending levels of customers for any given store location are likely to affect satisfaction levels as well as store profits, but they are not likely to change from one period to the next. Under the assumption that such variables will influence past profits to the same extent as current profits, we control the effect of such variables by including past profits as an independent variable in our regressions. We also analyzed a changes model using the customer satisfaction measure for which we have two years of comparable data. The results of this analysis are similar to those obtained using the levels specification. The coefficient on the interaction of change in customer satisfaction with *HICOMP* is significantly positive ($\hat{\beta} = 1.0534$, $p = 0.0040$) while the coefficient on the interaction of change in customer satisfaction with *LOCOMP* is only significant at the 10 percent level ($\hat{\beta} = 0.3944$, $p = 0.0784$). The *F*-test examining the null hypothesis of equal coefficients on customer satisfaction in HI_COMP and LO_COMP stores is rejected at the 10 percent level of significance.

Figure 1 Path model examining the relationships between employee satisfaction, customer satisfaction, revenue per square foot, and profit per square foot

Panel A: HI_COMP subsample



Panel B: LO_COMP subsample



Notes:

For ease of presentation, factors loadings have not been displayed in the figures.

All coefficients shown in the models are normalized values.

* Significant at the 0.01 level (one-tailed).

7. Concluding remarks

The reporting of nonfinancial measures has been justified in the practitioner-oriented literature based on the assumption that these measures may be lead indicators of future profitability. While earlier studies have shown that some of these measures may be associated with future profits, it is critical to evaluate the conditions under which these measures are useful. If contextual factors moderate the relationship between nonfinancial measures and financial performance, then understanding these factors is essential for using them in managerial decision making and incorporating them in management reporting systems.

Prior studies on the time-series properties of the earnings stream have indicated the limited ability of current earnings to predict future earnings, thus suggesting a role for additional measures that can improve the predictability of future earnings. Using data from more than 800 stores of a department store chain, we examined the ability of employee satisfaction and customer satisfaction to predict future profits, after controlling for information contained in current and past profits. We found that employee satisfaction and customer satisfaction scores are incrementally useful in predicting future profits for stores in urban locations with higher intensity of competition. For stores in rural locations where competition is less intense, neither nonfinancial measure is able to predict future profits.

In a novel approach to validating the use of nonfinancial measures in management reporting systems, we examined managers' decisions that require predictions of future earnings to see whether they rely on subjective information that is correlated with customer satisfaction and employee satisfaction. We first explored what nonfinancial measures are associated with information that managers found useful in predicting future earnings to select stores for closure. We found that both employee satisfaction and customer satisfaction measures are significant predictors of store closures and, thus, are able to capture other nonquantified information used by managers in decision making. We also explored the ability of customer satisfaction and employee satisfaction scores to capture subjective information used by managers in actual performance evaluations of store managers. We find that although the information contained in customer satisfaction is significant in explaining performance ratings, information contained in employee satisfaction is not.

The principal contribution of this study is in furthering our understanding of the possible value of reporting nonfinancial measures such as employee satisfaction and customer satisfaction. The study underscores the importance of understanding the influence of contextual variables, such as competition, when validating the usefulness of nonfinancial measures in a reporting system. This finding should be generalizable and could therefore be tested in other settings where the level of competition varies. In conducting our study, limitations of data availability restricted our measurement of competition to using the urban or rural location of stores. The use of more precise proxies of competition will further strengthen our findings. Another constraint of the limited data available to us has been our use of cross-sectional analyses in our empirical models. A fruitful avenue of future research would be to analyze time-series panel data, which would allow for investigation into the lead–lag relationships between the nonfinancial measures and future financial performance.

Appendix

Description of survey questions

Customer survey (10-point scale)

	Questions	Mean	Standard deviation	Cronbach's alpha
	In comparison to other department stores you frequently shop, how would you rate this RETAILER store on:			0.9107
1.	Having the merchandise you want in stock	6.6815	0.5357	
2.	Having good value merchandise for the price paid	7.2731	0.3508	
3.	Having sales associates who are available, friendly, and knowledgeable	6.9014	0.4524	
4.	Overall, would you recommend this RETAILER store to a friend?	8.1798	0.4109	

Employee survey (10-point scale)

	Questions	Mean	Standard deviation	Cronbach's alpha
1.	Overall, would you recommend to a friend that he or she shop at your RETAILER store?	8.4555	0.6057	0.8694
2.	Overall, how satisfied are you that during the last year, you had the opportunity to learn and grow at work?	6.7064	0.7994	
3.	Overall, would you recommend your RETAILER store as a place to work to a friend?	6.7161	0.9158	

Endnotes

1. While the spread of the Internet may change the competitive landscape of the department store segment of the retail industry, even today only a small portion of total sales for this retail segment is generated through the Internet. The latest annual report of our sample firm shows that Internet sales remain less than 1 percent of total sales revenue even though they have been selling online for many years and are recognized as a leader in Internet retailing. This suggests that the importance of competition as a moderating variable in this retail category may not change in the near future at least.
2. Note that the decision to close down particular stores was made in year $t + 1$. The collection of survey data used for measuring employee satisfaction and customer satisfaction had been completed by the end of year t. Information regarding which specific stores were to be closed was not made available to either employees or customers before year $t + 1$.
3. The objective was to assess the usefulness of these measures and engage the agency for further surveys in subsequent years only if the nonfinancial information was deemed to be useful for senior management. However, the actual data were not reported to managers while the planning and research department conducted its assessment. Year t is a recent year during which these data were collected. The firm had also hired an external agency to administer customer surveys in year $t - 1$ although with a limited number of survey questions.
4. While the HI_COMP and LO_COMP subsamples were formed on the basis of the urban or rural location of stores, we use this sampling to capture differences in the level of retail competition across these locations. While we believe, on the basis of our discussions with RETAILER management, that the intensity of competition is markedly different in urban and rural areas, we acknowledge that this sampling could also be picking up other differences such as demographics of urban and rural locations that are correlated with the intensity of competition. This error in variable measurement biases our tests against finding differences based on competition.
5. Managers who were close to this decision informed us that this was a temporary decision made by new management to deal with short-term profitability issues. To the extent we can rely on the knowledge of our sources within the company, we can conjecture that this decision was not reflective of the usefulness of the information provided by these surveys.
6. This model is equivalent to running separate regressions for the HI_COMP and LO_COMP subsamples. The reason we chose the dummy variable approach is to (1) enable easier interpretation of results, and (2) provide a more efficient test of comparing the coefficients across the HI_COMP and LO_COMP subsamples (Judge, Hill, Griffiths, Lütkepohl, and Lee 1988).

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