

The impact of HR practices on the performance of business units

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This article examines the impact of HR practices and organisational commitment on the operating performance and profitability of business units. Using a predictive design with a sample of 50 autonomous business units within the same corporation, the article reveals that both organisational commitment and HR practices are significantly related to operational measures of performance, as well as operating expenses and pre-tax profits.

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Firms have increasingly recognised the potential for their people to be a source of competitive advantage (Pfeffer, 1994). Creating competitive advantage through people requires careful attention to the practices that best leverage these assets. This change in the mindset of executive decision-makers has spurred an increasing body of academic research attempting to reveal a relationship between a firm's HR practices and its performance.

Much of this research has demonstrated statistically significant relationships between measures of HR practices and firm profitability (Delery and Doty, 1996; Guthrie, 2001; Huselid, 1995). While these studies have been useful for demonstrating the potential value created through HR practices, they have revealed very little regarding the processes through which this value is created (Wright and Gardner, 2002). Some authors have referred to this as the 'black box' problem, noting that the conceptual development of the mediating mechanisms through which HRM has an impact on profitability has thus far eluded empirical testing (*eg Purcell et al, 2003*).

In addition, the vast majority of studies examining the relationship between HR practices and firm performance have been entirely cross-sectional in their design. Again, while providing useful information, such designs are somewhat problematic. In essence, cross-sectional designs preclude making any causal inferences regarding the direction of the relationship. So, while we may believe the HR practices are driving firm performance, we cannot rule out that the reverse is actually the case.

Thus, the purpose of this study is to examine the relationship between HR practices and firm performance in a way that improves the causal inferences that can be drawn. This article goes beyond previous work in three ways. First, it examines the phenomenon at the business unit level, thus minimising the amount of potential 'noise' introduced when studying more heterogeneous HR systems across various businesses within corporations. Secondly, it uses more proximal measures of business unit performance rather than only the distal profitability or stock price measures. Finally, it uses a predictive research design enabling more confident causal inferences.

PREVIOUS RESEARCH

The body of research examining the relationship between HR practices and firm performance has grown exponentially over the past few years. The seminal work in this area was produced by Huselid (1995), who examined the relationship between HR practices and corporate turnover, profitability and market value. Huselid (1995) surveyed senior HR executives in a sample of 968 publicly traded corporations in the US regarding the percentage of employees who were covered by a set of HR practices generally considered representative of a high-performance work system (HPWS). After controlling for a number of variables, he found that his HR index was significantly related to the gross rate of return on assets (a measure of profitability) and Tobin's Q (the ratio of the market value of a firm to its book value). This study provided the foundation for much of the research that followed.

Delery and Doty (1996) examined the relationship between HR practices and profitability in a sample of banks in the US. In testing universalistic, contingency and configurational approaches to HRM, they found that, in general, HR practices were positively related to profitability. Guthrie (2001) examined the impact of HR practices on turnover and firm productivity among a sample of firms in New Zealand. He noted that HR practices had an impact on turnover, and that the relationship between retention and productivity was positive when firms implemented high-involvement HR practices, but negative when they did not.

Two major studies at the plant level have been conducted examining the relationship between HR practices and firm performance. MacDuffie (1995) found that the HR practice 'bundles' he measured were related to quality and productivity on auto assembly lines. Meanwhile, Youndt *et al* (1996) discovered that human capital-enhancing HR practices were related to operational performance among a sample of manufacturing plants.

While much of the research on the relationship between HR practices and performance has somewhat consistently revealed a significant relationship, some recent debates have emerged regarding the value of different approaches to studying this phenomenon. Debates have arisen regarding the proper sources for gaining the most valid reports of HR practice measures, the proper level of analysis and proximity of performance measures, and the timing of measurement.

Sources of HR practice measures

Regarding the use of single respondent designs, Gerhart *et al* (2000b) provided evidence calling into question the reliability of measures of HR practices stemming from single respondents. They found single-rater reliabilities to be frighteningly low. These results were largely replicated by Wright *et al* (2001). Together, these two articles (consisting of four studies) suggested that the reliability of single raters may be close to zero.

Huselid and Becker (2000), in response to Gerhart *et al*'s (2000b) article, suggested that in many cases single respondents (*ie* senior HR executives) were the best placed, and perhaps the only ones qualified, to provide HR practice information across a number of jobs. This led to the debate regarding the most valid source of HR practice information.

As noted above, Huselid and Becker (2000) defended their use of senior HR executives as the most valid source of HR practice data. However, they also argued that the construct to be measured should be the HR practices actually implemented in the firm rather than HR policies that were not necessarily carried out. This led Gerhart *et al* (2000a) to suggest that, if one seeks to assess the actual practices, then using employees as the source of HR practice data would be a more logical approach.

Outcomes and level of analysis issues

Dyer and Reeves (1995) reviewed much of the existing research on the relationship between HR practices and performance and proposed that measures of performance could be broken down into four categories. First, employee outcomes deal with the consequences of the practices on employees such as their attitudes and behaviour, particularly behaviour such as absenteeism and turnover. Organisational outcomes focus on more operational measures of performance such as productivity, quality and shrinkage, many or all of which would be precursors to profitability. Financial/accounting outcomes refer to the actual financial performance measures and include expenses, revenues and profitability. Finally, market-based outcomes reflect how the financial markets value a firm, particularly stock price or variations of it.

Rogers and Wright (1998) reviewed the empirical research on the HR performance relationship, surveying 29 studies reporting 80 'effect sizes' (ie reported statistical relationships between HR practice and performance measures), and noted two particularly relevant trends. First, although strategic HRM focuses largely on the link between HR and business strategy, the largest bulk of research had been conducted at the corporate level of analysis. A lesser amount of research has used the establishment level. Almost entirely ignored was research on the link between HR and performance at the business unit level of analysis.

Secondly, with regard to the types of performance outcomes, they found that very few studies had examined HR outcomes (three effect sizes examined turnover), many had used accounting and financial market measures, and the largest number of effect sizes was observed for organisational outcomes (productivity, quality, service *etc.*) However, interestingly, while 34 effect sizes used these organisational outcomes, 68 per cent of them (25) were gathered from surveys, with only a small number coming from company records (seven) or public databases (two). Recognising the limitations of performance measures derived from informant surveys, we chose to utilise the company's archival records.

One is hard-pressed to separate the choice of outcomes from the choice of level of analysis. For instance, Becker and Huselid (1998) argue that the corporate level of analysis is valid because this enables the examination of shareholder wealth (a financial market outcome), which is the corporation's *raison d'être*. However, Huselid and Becker (2000) recognised potential methodological issues at this level as they suggested that one reason for the low reliabilities in the Gerhart *et al* (2000a) study was the inclusion of large diversified corporations. They noted that the original Huselid (1995) study had an average company size of approximately 4,000 employees.

On the other hand, Wright *et al* (2001) questioned the usefulness and validity of research at the corporate level of analysis. They noted that, given the potential for huge variations in HR practices across business units and sites, the potential for gaining accurate and valid measures of HR practices was quite low. In addition, Rogers and Wright (1998) suggested that conceptually, studying the link between HR and business strategy suggests focusing at the business unit level of analysis.

Regardless of the level of analysis, numerous authors have suggested the need to better understand the processes through which HR practices might have an impact on performance (Becker and Huselid, 1998; Dyer and Reeves, 1995; Hutchison *et al*, 2002; Wright and Gardner, 2002). While a number of models have been proposed (eg Becker and Huselid, 1998; Dyer and Reeves, 1995; Truss and Gratton, 1994), very little empirical research has examined multiple potential linkages (Wright and Gardner, 2002). Dyer and Reeves' (1995) categorisation of outcomes suggests that (a) some

outcomes, such as HR outcomes, are more proximal to HR practices than others, and (b) the impact that HR practices have on more distal outcomes are through the impact on more proximal outcomes. Together, these two points suggest that to understand how HR practices affect profitability, one would need to see what impact they have on proximal outcomes (eg HR outcomes) that have an impact on more distal outcomes (eg organisational outcomes) and consequently have an impact on the most distal outcomes (eg profits). Given the paucity of research on HR outcomes alone, and the lack of research examining multiple outcomes in a causal chain, the existing research base presents little empirical data to shed light on the causal process through which HR practices affect performance.

Timing of measurement

While not obvious to most, the timing of measurement in much of the research on the impact of HR practices on performance has precluded drawing firm, causal conclusions of this relationship. Very few studies have used simple, cross-sectional designs that present problems in drawing causal inferences. However, many of the studies accepted as being somewhat predictive are not true predictive designs. For instance, Ichniowski *et al* (1997) used monthly performance data from steel finishing lines over a three-year period. However, they measured HR practices by asking respondents after the three-year production period to recall which HR systems were in place at different points during the timeframe. Similarly, Guthrie used performance data from 1996-97 but asked respondents during that time to report the practices that existed during 1995-96. Given the potential problems noted above with regard to the unreliability of single-rater responses, compounded with the memory requirements to report practices that existed from one to three years in the past, such retrospective designs are problematic for drawing causal conclusions.

Others, while not using purely cross-sectional designs, gathered contemporaneous data. For instance, Delery and Doty (1996) gathered HR practice data during 1992 and used the year-end performance data. Because the year-end data includes performance from months prior to and concurrent with the HR practice measure, it is difficult to draw firm causal conclusions. Huselid (1995) gathered both contemporaneous and subsequent year performance data and reported only the subsequent year data in his study in order to provide more conservative effect size estimates.

As can be seen by this detailed analysis of the designs, some of the seminal studies in the HR performance literature fail to provide predictive designs that allow the drawing of more confident causal inferences. Concurrent and retrospective designs are particularly weak for drawing causal conclusions because they may be subject to implicit performance theories, suggesting that knowledge of firm performance can influence reports of HR practices. For instance, a study by Gardner and Wright (2003) presented executives and graduate students with fictitious descriptions of high and low-performing companies and found evidence that their reports of HR practices can be influenced by knowledge of the company's past performance.

This article seeks to provide more definitive causal inferences by (a) using business units as the level of analysis, (b) using multiple employees as the sources of HR practice measures, (c) assessing HR, organisation and financial outcomes, and (d) using a predictive design where the operational and financial performance measures temporally follow the gathering of the HR and employee attitude data.

HYPOTHESES

To date, Becker and Huselid (1998) offer the most logical and definitive model of the processes through which HR practices affect firm performance. They suggest that HR practices have a direct impact on employee skills, motivation, job design and work structures. These variables elicit certain levels of creativity, productivity and discretionary effort, which subsequently translate into improved operating performance. This has an impact on profitability and growth, which in turn have a direct impact on the firm's market valuation.

The model we suggest in this article diverges slightly from the basic Becker and Huselid (1998) model – not so much in logic as in the actual variables measured. We base our hypotheses on job performance theory (Campbell, 1990). According to this theory, performance is behaviour; people's actions have an impact on the organisation's goals. This can be positive or negative, and the behaviour can be either prescribed as part of the job or outside the prescribed duties.

Researchers examining various task elements and role behaviour in both micro and macro organisational behaviour literature seem to agree on three categories of job behaviour relevant to organisational performance. First, in-role behaviour refers to behaviour expected of employees, largely based on job requirements and commonly accepted norms. This has also been referred to as 'core task proficiency' (Campbell, 1990). In essence, such behaviour entails doing what one was hired to do.

Extra-role behaviour consists of behaviour going outside the requirement for the job and which has a positive effect on organisational performance. For instance, helping others, redesigning processes to be more efficient or deviating from standard operating procedures when necessary to serve a good customer might exemplify extra-role behaviour. This has sometimes been referred to as citizenship behaviour (Organ, 1988), prosocial behaviour (Brief and Motowidlo, 1986), organisational spontaneity (George and Brief, 1992) and discretionary behaviour (MacDuffie, 1995). In essence, extra-role behaviour consists of going beyond the call of duty for the good of the organisation.

Finally, counter-productive (or dysfunctional) behaviour usually consists of activities, in-role or extra-role, that are specifically or implicitly aimed at harming the organisation (Sackett and DeVore, 2000). For example, theft of materials, sabotage or strikes are specifically aimed at harming the organisation's performance, while 'time theft' (eg spending time on personal errands or phone calls) is implicit.

The attitudes of core workers can have considerable influence on these three categories of work behaviour in organisations. Because attitudes include behavioural as well as affective and cognitive components (Fishbein and Ajzen, 1972), they are important antecedents of employee participation and role behaviour in work environments. In fact, a recent meta-analysis found that a number of business unit-level outcomes were positively associated with employee attitudes (Harter *et al*, 2002). The present research examines the effects of a key work attitude – organisational commitment – on a variety of performance outcomes of central importance to organisational effectiveness. It assumes that these outcomes are influenced by the different categories of job behaviour discussed above.

In addition to examining the outcomes of commitment, we posit that HR practices are an important lever driving this type of attitude. Prior research at the individual level of analysis supports the notion that the management practices of an organisation influence individual employee feelings of commitment (eg Konovsky and Cropanzano, 1991; Meyer and Allen, 1997). There are a number of ways an

organisation's HR practices can foster a collective level of commitment in its workforce. First, we suggest that the initial impact of HR practices on employees' commitment to the organisation begins with selection and staffing. When firms invest in selecting the most highly skilled people, and providing them with increased skills through continuous training and development opportunities, employees find a workplace filled with well qualified co-workers. This makes for a positive work environment by enabling them to focus on serving their own customers successfully, doing their own job well and not having to constantly clean up the mess of other co-workers.

Additionally, by using valid performance management systems and monetary incentives to elicit high performance, employees can see a more direct line of sight between their behaviour and their personal outcomes. This creates a positive work environment where individuals feel fairly and equitably rewarded for their efforts.

Finally, having open communications and participatory systems enables employees to both understand the organisation's competitive position and be able to participate in processes to help improve it. This creates a positive work environment where people feel they are listened to and respected. An environment created by the systems discussed above is one where people are unlikely to want to leave; they identify with the organisation personally and want to see it succeed. This describes the construct of organisational commitment (Porter *et al.* 1974).

Virtanen (2000) argues that the social nature of commitment includes such issues as consistency of observable behaviour and loyalty, together with ideology, conviction and value systems. Thus, commitment influences an employee's view of obligations, utilities and emotions in any work situation, and thus has an impact on the behaviour of employees. Consequently, employees who are committed to an organisation should be motivated to exhibit higher quality in-role behaviour, exhibit a greater volume of positive extra-role behaviour and engage in less counter-productive behaviour relative to those who are not committed. This role behaviour is likely to have an impact on a number of operational performance measures. For instance, committed employees following safety rules (in-role) are less likely to be injured and are unlikely to either exploit minor injuries or make spurious or fictitious injury claims (counter-productive), resulting in fewer workers' compensation claims.

Businesses with committed employees should also experience higher productivity as their employees seek to better execute required behaviour, go beyond the job to devise more efficient ways of working (extra-role) and are not likely to shirk or 'free-ride' (counter-productive). Such businesses should also experience higher quality performance as employees are more likely to execute job behaviour well (in-role) and less likely to sabotage order deliveries (counter-productive). Finally, committed employees are far less likely to steal or damage goods (counter-productive) resulting in inventory shrinkage for the business.

Because workers' compensation claims, productivity, quality and shrinkage all have a direct impact on the costs of an organisation, by influencing these variables employee commitment should have an impact on operating expenses. Profitability is largely determined as the difference between revenue and expenses, leading to the conclusion that, if commitment has an impact on operating performance which, in turn, has an impact on expenses, then it should subsequently be related to profitability.

METHOD

Overview

This article reports on research that examines the relationships of both HR practices and organisational commitment with various operational measures of performance using a predictive research design. Employee attitude surveys were conducted and related to subsequent performance measures collected in the three to nine-months timeframe after the survey data was collected.

Sample

The sample consisted of 50 business units of a large food service corporation with operations in the United States and Canada. The corporation provided products to meet all the needs of restaurants and other food service companies (*eg* food, napkins, silverware *etc*). In each of the units (internally they were referred to as 'companies'), we used the survey responses from employees in three core jobs – MAs or Merchandising Associates (*ie* salespeople), delivery drivers and warehouse employees. These three jobs had the most direct impact on the customer from sale to delivery. In fact, the company prided itself on having its army of MAs, who were extremely knowledgeable about its products and could work effectively with their customers to find the right products, as one source of competitive advantage. However, no matter how well MAs sold, customers were extremely dissatisfied if the delivery of their orders was either not on time or incorrect; these responsibilities fell to the warehouse workers who prepared the deliveries and the drivers who actually delivered the orders.

The sample consisted of 5,635 respondents. Each company had an average of 38.30 MAs, 34.96 drivers, 39.44 warehouse workers and 112.70 employees. In order to eliminate the possibility of common method variance (or percept-percept correlations which are biased by collecting two measures from the same source using the same method at the same time), we used the reports of HR practices from half of the respondents from each organisation and the reports of organisational commitment from the other half.

This company's management philosophy, emphasising structural ways to create an entrepreneurial environment, presented a unique opportunity to study the relationship between HRM and performance in a controlled field setting. First, the company tried to keep every business between \$350 million and \$700 million in revenues, with a corresponding employee count of between 250 and 600 employees. If a company grew beyond the \$700 million mark, it was then divided into two. This created a sample where size (both in terms of revenue and employees) was strongly controlled. Also, the basic products and IT were largely uniform across all the units. While regional differences may have resulted in different volumes and mixes of products, the products available for sale were uniform. Similarly, while localised changes might be made to IT, the basic systems were largely uniform. Thus, again the sample controls for performance differences were due to products and technology.

However, while size, technology and products provided little opportunity for variance, considerable differences existed with regard to HR strategies. Guided by the corporate principle of earned autonomy, business units were largely free to manage their employees however they saw fit. Minimal uniformity in HR practices existed with regard to legally mandated benefits, but the majority of HR practices (*eg* specific selection processes and practices, pay systems, performance management systems, training and development strategies and practices) were left to the business units to design, develop and implement.

Corporate control over the business units came from monitoring the operational and financial results we report here. This is analogous to the 'financial' controls as opposed to 'strategic' controls discussed in the corporate strategy literature (Rowe and Wright, 1997). Thus, this sample provided a unique opportunity to study the HR performance relationship, where many sources of extraneous variance are controlled through design (thus negating the need for statistical controls), while the major focus of variance concerned the phenomenon of interest – HR practices.

We should note that this lack of corporate HR authority to dictate HR practices in the business units both drove the decision to implement 'climate' surveys and exemplified the problem in implementing them. The senior vice president of HRM sought to use the survey as a means of providing empirical data, demonstrating the positive business benefits that could be gained by managing people in a more progressive way. He hoped (and hopes) this data will encourage business units to develop more progressive HR practices. However, because he could not mandate anything, not all companies participated in the survey (although the numbers were progressively growing each year).

MEASURES

HR practices

Employee respondents in each work unit were asked whether or not nine specific HR practices existed for their job category (1 = 'Yes', 2 = 'No', 3 = 'I don't know'). 'I don't know' responses were classified as 'No' (see Table 1, *opposite*, for the complete listing).

The choice of the nine items was based on a compromise between what the researchers wanted to examine and what the company was willing to allow to be asked. We were allowed to add some actual HR practice items to the survey in return for a reduced fee (the company was originally only interested in assessing the climate). First, we examined some of the seminal studies described above (eg Becker and Gerhart, 1996; Delery and Doty, 1996; Huselid, 1995; Ichniowski *et al*, 1997) to identify the items that had been used in past research. We identified approximately 25 items that we wanted to use originally. However, space limitations required us to cut back the items to 15. The company then refused to allow us to ask some questions they deemed too sensitive in terms of potentially priming employees to wonder why they did not have these practices (eg gainsharing and profit-sharing). In the end, we used items that represented the major areas of HR practices: selection, pay for performance, training and participation.

One training item, 'On average, how many hours of formal training do employees in this job receive each year?', was originally written in a different response format from the rest of the HR practice items and was re-coded to comply with the 'Yes'/'No' dichotomous response format of the other practice items. If the number of training hours entered was equal to or greater than 15, that response was coded as 1 = 'Yes'. Hours below 15 were coded as 0 = 'No', as such low levels arguably did not represent significant investment in employee training.

Consistent with previous research, we used an additive index of these HR practices (eg MacDuffie, 1995; Youndt *et al*, 1996). Because there was no reason to believe these practices should be conceptualised as a unidimensional construct (Delery, 1998), inter-rater reliability was deemed the most appropriate reliability assessment. Intra-class correlations were computed for this scale at the job group level because differences in

HR practices existed across the groups (MAs had the highest scores, followed by drivers and warehousemen, respectively).

For each individual, a ratio was calculated of the number of practices they stated were present, divided by nine. The business unit index of HR practices was created by taking the mean of this ratio for the half of the employees providing information about this measure. These measures illustrated that using a single respondent (ICC (1), which assessed the reliability of a single respondent measure), would result in extremely low reliability, but that by using multiple respondents (ICC (2), which assessed the reliability of using aggregated multiple respondents), the reliability of the measures is more than adequate (average item ICC (1) = .07, average item ICC (2) = .77; scale ICC (1) = .13, scale ICC (2) = .89).

Organisational commitment

Five items were used from two different organisational commitment scales (Meyer and Allen, 1997; Porter *et al.*, 1974). Sample items included: 'I feel a strong sense of belonging to this organisation', 'I am willing to work harder than I have to help this company succeed' and 'I am proud to be working for this company'. Items were

TABLE 1 *HR practice questions*

<p>SELECTION AND STAFFING^a</p> <p>1 Applicants undergo structured interviews (job-related questions, same questions asked of all applicants and rating scales) before being hired.</p> <p>2 Qualified employees have the opportunity to be promoted to positions of greater pay and/or responsibility within the company.</p> <p>3 Applicants for this job take formal tests (paper and pencil or work sample) before being hired.</p> <p>TRAINING</p> <p>4 On average, how many hours of formal training do employees in this job receive each year?^b</p> <p>PAY FOR PERFORMANCE</p> <p>5 Employees in this job regularly (at least once a year) receive a formal evaluation of their performance.</p> <p>6 Pay raises for employees in this job are based on job performance.</p> <p>7 Employees in this job have the opportunity to earn individual bonuses (or commission) for productivity, performance or other individual performance outcomes.</p> <p>PARTICIPATION</p> <p>8 Employees in this job are involved in formal participation processes, such as quality improvement groups, problem-solving groups, roundtable discussions, or suggestion systems.</p> <p>9 Employees in this job have a reasonable and fair complaint process.</p> <p>^a With the exception of those marked, the response option for these questions was, 'Yes', 'No', or 'I don't know'</p> <p>^b Response option was 'Hours _____'</p>
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averaged to create one index per person, then aggregated to the business level using half the sample of employees providing information about commitment. Again, aggregating over respondents resulted in good reliability ($\alpha = .86$, ICC (1) = .07, ICC (2) = .78).

Performance

Six measures of performance were provided from archival company records. Each measure was for a six-month period, beginning three months after the administration of the attitude survey (see Figure 1). These measures represented the major performance measures tracked by the corporate headquarters as indicators of a businesses success. ‘Workers’ compensation’ was the workers’ compensation expenses incurred during the six months divided by sales; the lower the number the better. ‘Quality’ was measured as 100,000 pieces per error, where each piece represented a carton. ‘Shrinkage’ was measured as the percentage of inventory loss, including loss due to spoilage, warehouse outs, inventory adjustments, cycle count adjustments, warehouse damage, delivery shorts, delivery damage, samples shrinkage and sales return damage. ‘Productivity’ was assessed as payroll expenses for all employees, divided by the number of pieces; the lower the number the better. ‘Operating expenses’ consisted of all relevant business operating expenses, including warehouse, occupancy, delivery, selling, data processing and general and administrative expenses. Finally, ‘Profitability’ was assessed as the operating pre-tax profit of the business unit as a percentage of sales where operating pre-tax profit was calculated as sales – (cost of goods sold + operating expenses + cash discounts).

RESULTS

Because of the small sample size, we examined the relationships among the relevant variables using only bivariate correlations. We were less interested in interpreting any specific results than in understanding the overall pattern of results in how HR practices and employee commitment relate to more proximal performance measures. The descriptive statistics and intercorrelations are provided in Table 2 (*opposite*).

In order to disguise the data, the overall mean was subtracted from each company’s actual value on each variable. Consequently, the standard deviations represent the actual variations in the real units for each variable, but the mean is always set to zero.

As can be seen in Table 2, the first link in the hypothesised causal chain shows a relationship between HR practices and organisational commitment. The observed

FIGURE 1 *Hypothesised model*

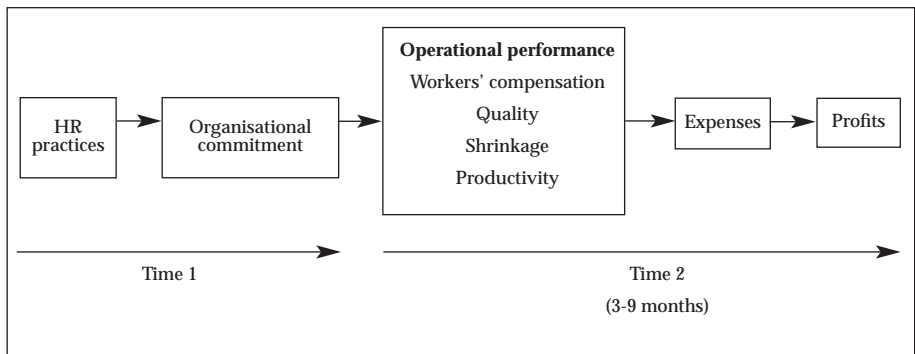


TABLE 2 Correlations of HR practice, commitment, operational and financial performance measures

	Mean	SD	HR Practices	Commitment	Workers' compensation	Payroll per piece	Piece per error	Shrink	Operating expense
HR practices	.0	.11							
Commitment	.0	.27	.55**						
Workers' compensation/sales	.0	.001	-.27†	-.44**					
Payroll per piece	.0	.26	-.20	-.44**	.50**				
Payroll per error	.0	223.37	.42**	.27†	-.32*	-.21			
Shrink	.0	.001	.27†	-.27†	.25†	.33*	-.52**		
Operating expense	.0	.01	-.40**	-.50**	.62**	.77**	-.40**	.46**	
Profit	.0	1.03	.35*	.32*	-.37**	-.40**	.58**	-.43**	-.66**

* $p < .05$ ** $p < .01$ † $p < .10$

To protect the confidentiality of the company studied, all variables have been centred by subtracting their mean.

correlation of $r = .55$ ($p < .01$) demonstrates support for this relationship. We should note that this correlation is based on concurrent measures, but because each measure came from a different subset of employees, it is not subject to percept-percept bias.

The next hypothesised set of relationships was between these two variables and the four operational performance measures. The closer proximal relationships revealed that organisational commitment was strongly and significantly related to workers' compensation expenses ($-.44$; $p < .01$) and productivity ($-.44$; $p < .01$), and was marginally related to quality ($.27$; $p = .06$) and shrinkage ($-.27$; $p = .06$). More distally, HR practices were strongly and significantly related to quality ($.42$; $p < .01$), marginally related to workers' compensation expenses ($-.27$; $p = .06$) and shrinkage ($-.27$; $p = .06$), and unrelated to productivity ($.20$; n.s.).

The HR practices and organisational commitment were also strongly and significantly related to operating expenses ($-.40$ and $-.50$, respectively; both $p < .01$) and profitability ($.35$ and $.32$, respectively; both $p < .05$). Completing the causal chain, the operating performance measures of workers' compensation, productivity, quality and shrinkage were all strongly and significantly related to expenses ($.62$, $.77$, $-.40$ and $.46$ respectively; all $p < .01$) and profitability ($-.37$, $-.40$, $.58$ and $-.43$, respectively; all $p < .01$), and expenses were strongly and significantly related to profitability ($-.66$; $p < .01$).

While not conducting a thorough path analysis, the results seem to indicate that HR practices have an impact on operational performance at least in part through their impact on employee commitment (due to HR's weaker relationships relative to commitment), and the impact commitment has on profitability is largely through operational performance (because of its weaker relationships relative to the operational performance measures).

DISCUSSION

The results of this study reveal a detailed, predictive model of HR's impact on profitability, consistent with the model hypothesised by Becker and Huselid (1998). The measures of HR practices were demonstrated to be highly reliable, unlike past research in this vein (Wright *et al*, 2001). In addition, these measures were assessed prior to the later performance measures, thus providing a bit more weight to the (albeit not perfect) drawing of causal inferences. The study also demonstrated the relationships between both HR practices and organisational commitment, with a number of operational and financial performance measures. Finally, the unique nature of the company studied enabled us to control for a number of sources of extraneous variance that would exist in cross-company, and particularly cross-industry, studies to provide a much cleaner test of the impact HR has on financial performance.

The results revealed that HR practices were strongly related to organisational commitment. While the observed relationship's reliance on cross-sectional data precludes making any causal attributions, it is important to note that using separate samples for each of the two measures eliminates common method variance as an explanation. It should also be noted that using employees as the source of the HR practice measures ensures that the measure represents the actual practices rather than the espoused policies of the business (Huselid and Becker, 2000; Wright *et al*, 2001). Finally, using multiple employees provided a psychometrically sound measure of these practices – something that has rarely been observed in the past (Gerhart *et al*, 2000a, 2000b; Wright *et al*, 2001).

These measures of practices and employee attitudes were strong predictors of operational performance measures used within the company to track business unit performance. The correlations ranged from $.20$ to $.44$ (in absolute values) so that even

the non-significant relationships were strong and in the expected direction, and their non-significance was likely due to the small sample size. Thus, the study tends to support the hypothesised relationships of both HR practices and employee commitment with business unit operational performance.

Finally, both HR practices and employee commitment were strongly and significantly related to operating expenses and profitability. While the relationship between HR practices and profitability has been demonstrated before at the corporate level (Delery and Doty, 1996; Guthrie, 2001; Huselid, 1995) and at the establishment level (MacDuffie, 1995), this is the first study to demonstrate it at the level of the business unit.

Thus, it seems that, when employees are managed with progressive HR practices, they become more committed to their organisation. At least in part, this commitment leads them to exhibit proper role behaviour (and thus lower workers' compensation costs, higher quality and higher productivity) and to not engage in dysfunctional behaviour (that would result in shrinkage). Again, in part, these operational performance outcomes result in lower overall operating expenses and higher profitability.

The relatively large effect sizes observed here are due to the nature of the design, which points to both the strength and weakness of this study. Kerlinger (1973) notes that the purpose of research design is to maximise the experimental variance, minimise error variance and control systematic variance. The 'earned autonomy' philosophy of the corporate headquarters provided a setting which allowed for considerable true variance in HR practices. The constrained size, technology and products controlled the systematic variance. In addition, the use of multiple raters for the HR and commitment measures minimised error variance (due to measurement error), resulting in a design that maximised the possibility of finding support for the hypothesised relationships. With much of the systematic and error variance eliminated through design and methodology, the variance explained by HR practices could constitute a larger percentage of the total variance explained. In essence, this mimics a laboratory study conducted in the field, enabling us to more specifically tease out the nature of the relationships we sought to study. Future research with additional waves of data from this organisation will help us understand these mediating relationships.

However, because these factors created the equivalent of almost a laboratory study in a field setting, they also lead to the same criticisms that are levelled at laboratory studies. Most importantly, one could easily criticise the generalisability of the results. Large, cross-industry studies such as Huselid's (1995) are subject to considerably more systematic and error variance, but their results are also significantly more generalisable.

We should also note that, while the design minimises a number of sources of extraneous variance (eg size), it does not eliminate all sources. For instance, each company was located in geographically distinct markets, and local labour and customer market conditions may vary widely. It is impossible to tell how this variance might affect the results but we must recognise that it may have some influence.

Another weakness of this study is its failure to actually assess the behavioural constructs we use to hypothesise the relationships between HR/commitment and performance. We suggest that employees are less prone to engage in counter-productive behaviour and more likely to exhibit both proper in-role and discretionary behaviour. However, we were unable to actually measure this, and can only assume they existed based on the performance outcomes of such behaviour.

In addition, we should note that, while this study is predictive in that the measures

of HR practices and commitment temporally preceded the measures of performance, it is not a true longitudinal design. Consequently, we cannot draw firm causal conclusions. However, the design is similar to a predictive validation in a selection context in that we were assessing the predictors temporally prior to the dependent variables. Certainly, this does not prove causation, but provides a more rigorous design than either a cross-sectional or a retrospective design. We continue to work with this company and hope to tease out causal direction by examining how past performance relates to reports of HR practices and commitment, and how those relationships compare with the kind reported here.

An additional limitation is that, while the reports came from employees who should be best placed to report the actual HR practices that exist (as opposed to the policies that are supposed to be implemented but may not be), there is still room for error. Employees may not be completely accurate and, in some cases, may not be completely knowledgeable about practices that have an impact on others. By using multiple employees, this problem is minimised, but not eliminated.

PRACTICE IMPLICATIONS

The results of this study support the notion that businesses which manage employees with more progressive HR practices can expect to see higher operational performance as a result. In fact, we noted previously that the senior vice president of HR sought this data as a way to influence these autonomous business units to more effectively manage their people. Consequently, he has used this data in presentations at meetings with company presidents to demonstrate the kind of performance they might gain by developing and implementing proven HR practices. In addition, the company has now developed a portal to aid business unit presidents whose units are not meeting their performance goals. The website helps them identify their key performance deficiencies (eg workers' compensation costs) and then provides information on the practices they can implement that should help increase their performance on this performance measure.

In summary, this study used a highly controlled setting and sample, and a predictive design to better analyse the processes through which HR practices might have an impact on firm profitability. Our results seem to indicate support for the hypothesised model. Future research should focus on providing more detailed and more generalisable findings to add to the knowledge base, exploring how firms can leverage people as a source of competitive advantage.

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