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# THE RELATIVE IMPORTANCE OF COMPREHENSIVE PERFORMANCE MEASUREMENT SYSTEMS AND FINANCIAL PERFORMANCE MEASURES ON EMPLOYEES' PERCEPTIONS OF INFORMATIONAL FAIRNESS

Chong M. Lau and Vimala Amirthalingam

## ABSTRACT

*Research on how performance measurement systems affect employees' perceptions of workplace fairness is important. As organizations often rely on their performance measurement systems to communicate information to their employees, it is useful to ascertain if and how the developments of performance measurement systems that are far more comprehensive than traditional financial systems affect employees' perceptions of informational fairness through the information communicated to employees. Informational fairness refers to employees' perceptions of workplace fairness that is based on the amount and the truthfulness*

*of information that organizations provide to their employees. Based on a sample of managers from manufacturing organizations, the Partial Least Square results indicate that comprehensive performance measurement systems (comprehensive PMS) have a significant direct effect on job-relevant information. They also indicate that comprehensive PMS have an indirect effect on informational fairness via job-relevant information. In contrast, systems that are based on financial measures have no significant effects on job-relevant information and informational fairness. These results demonstrate how comprehensive PMS (through the communication of a greater amount of job-relevant information) can be used to engender employees' perceptions of high workplace fairness.*

**Keywords:** Comprehensive performance measurement systems; financial measures; job-relevant information; informational fairness

## INTRODUCTION

This study investigates the informational effects of comprehensive performance measurement systems (comprehensive PMS) and those of systems based primarily on financial performance measures on (1) the extent of job-relevant information generated and (2) the levels of employees' perceptions of informational fairness. The purposes are to ascertain (1) if the use of comprehensive PMS vis-a-vis financial measures systems as performance measurement and evaluation systems is perceived as informationally fair or unfair by employees and (2) if such informational fairness perceptions are influenced by the extent of job-relevant information engendered by comprehensive PMS and systems based on financial performance measures, respectively. Comprehensive PMS are systems with a diverse set of measures comprising both financial and nonfinancial information to provide a broad range of performance information about different areas and different dimensions of a unit performance. They provide a variety of information that covers critical areas of each unit's operations (Burney & Widener, 2007; Chenhall, 2005; Hall, 2008).

The popularity of multidimensional performance measurement systems (e.g., Balanced Scorecard, Tableau de bord and performance hierarchies) in recent period has led to an increased interest and an increased use of performance measurement systems that are comprehensive for measuring and evaluating organizational performance. There have also been suggestions

that the increased reliance on such comprehensive PMS for organizational performance measurement may be more effective if such systems are also linked to employee performance measurement and evaluation (Burney, Henle, & Widener, 2009; Burney & Widener, 2007; Hall, 2008; Kaplan & Norton, 1992, 1996). Following such suggestions, there is a need for research on the behavioral implications in the use of comprehensive PMS. Several key questions need to be addressed empirically. First, would employees perceive the use of comprehensive PMS as fair or unfair from an informational perspective? Second, why would employees perceive the use of comprehensive PMS as fair or unfair from an informational perspective? Is it because comprehensive PMS engender a high extent of job-relevant information? Third, are the effects of comprehensive PMS on employees' perceptions of informational fairness indirect via job-relevant information? Finally, are the effects of comprehensive PMS on employees' perceptions of informational fairness different from those arising from the use of systems that rely primarily on financial performance measures?

Our study focuses on if and how performance measurement systems (comprehensive PMS vis-à-vis financial performance measurement systems) affect employee outcomes and perceptions. It contributes to the performance measurement systems literature in several ways. First, the study of such issues is important from a practical perspective as how employee performance is measured and evaluated may have profound effects on employees' reactions to their supervisors and their organizations responsible for the design and implementation of the processes used to measure and evaluate performance. Employee performance evaluation is important to employees. Employees are concerned with their performance evaluations as their remuneration, promotions, and career prospects may be closely related to the performance measurements and appraisals they receive from their superiors. In this regard, employees are concerned with the systems and the criteria (comprehensive PMS or financial measures) used by their superiors to measure and evaluate their performance.

Second, from a theoretical perspective, empirical results from prior management accounting studies have indicated that performance measurement systems and performance measures are related to employees' outcomes, perceptions, and behavior. Hall's (2008) results indicate that comprehensive PMS is positively related to both role clarity and psychological empowerment. Burney and Widener (2007) found that comprehensive PMS are related to job-relevant information. Burney et al. (2009) provide empirical evidence to support a positive relationship between comprehensive PMS and procedural fairness. These studies provide important systematic

empirical evidence to support the contention that performance measurement systems have important behavioral implications. Further research to extend such research findings may provide additional important insights into how performance measurement systems affect employees' outcomes and perceptions.

Third, the study of fairness of performance measurement systems and performance measures is important. Fairness in performance evaluation may be regarded as a key determinant of employees' reactions to performance evaluation. Consequently, it is important for organizations to know if the use of comprehensive PMS (vis-a-vis systems which rely only on financial measures) is perceived as fair or unfair by employees. While issues of performance evaluation and the determination of compensations have been the focus of much management accounting research since the seminal work of Hopwood (1972), earlier management accounting studies have not paid much attention to the effects of performance measurement systems on employees' fairness perceptions. Since the mid-1990s, there has been increasing interest in fairness issues in management accounting studies. These include studies by Magner and Welker (1994), Lindquist, (1995), Libby (1999, 2001), Lau and Lim (2002), Wentzel (2002), Burney et al. (2009), and Hartmann and Slapničar (2009).

While there has been increasing interest by management accounting researchers on fairness issues, there are concerns that several central questions remain either unaddressed or unclear. Of particular concern is the question of whether the different dimensions of fairness are properly identified and dealt with appropriately (Colquitt, 2001; Colquitt, Conlon, Ng, Porter, & Wesson, 2001; Greenberg, 1993). Prior management accounting studies have generally conceptualized fairness as procedural fairness and distributive fairness. Procedural fairness, in turn, has generally been conceptualized as a single construct. However, procedural fairness may not be a single construct but may comprise several dimensions including structural procedural fairness, interpersonal fairness and informational fairness (Colquitt, 2001; Greenberg, 1993). While researchers in other disciplines (e.g., management and organizational behavior) have been increasingly concerned with research which fail to distinguish among the different dimensions of procedural fairness (Colquitt, 2001; Colquitt et al., 2001), the notion that procedural fairness may not be a single construct have generally been given little attention by prior management accounting research. Colquitt (2001, p. 387) suggests that "an inability to separate purportedly distinct constructs at a measurement level leads to confusion regarding the nomological network of those constructs ... Moreover, the practice of

merging interactional (informational) and procedural (structural) fairness prevents researchers from uncovering important differences between the constructs ... procedural (structural) and interactional (informational) justice affect other variables through different intervening mechanisms ... Merging the two forms of justice ... creates practical problems as well. Should organizations devote more resources to improving the structural aspects of procedures or training leaders to act in an interactionally fair manner? Such answers cannot be answered at present.” (Parentheses added). Hence, identifying the different dimensions of procedural fairness and selecting the most relevant dimension of fairness for inclusion in the model facilitate the development of a more refined model and more powerful predictions of the relationships among the variables under investigation (Colquitt, 2001; Colquitt et al., 2001; Greenberg, 1993; Greenberg & Colquitt, 2005).

Our study compares the effects of comprehensive PMS with those of financial measures on employees' reactions to performance measurement systems. Since an organization's performance measurement system is a crucial means by which an organization communicates job-relevant information to its employees, the performance measurement system literature suggests that a comprehensive PMS is likely to communicate *more* job-relevant information to employees than financial measures (Chenhall, 2005; Hall, 2008; Kaplan, 1984; Johnson & Kaplan, 1991). Additionally, since a comprehensive PMS encompasses a much broader range of information (including both nonfinancial and financial measures, linkages across the value chain, and with organizational strategies) (Burney & Widener, 2007; Chenhall, 2005; Hall, 2008), the information derived from such a system is likely to be a *more accurate and truthful reflection* of situations than if a much narrower performance measurement system is used. Consequently, the use of a comprehensive PMS is likely to result in (1) a greater extent of job-relevant information provided to employees and (2) perceptions by employees that the information from the performance information system is truthful. These consequences of a comprehensive PMS are consistent with employees' perceptions of *informational* fairness. Informational fairness refers to employees' perceptions of workplace fairness that is based on the *amount* and the *truthfulness* of information that organizations provide to their employees. The organizational justice literature suggests that people's perceptions of how fair are the procedures are influenced by not only by the structures (technical aspects) of the procedures, but also how people are treated by others. The Group Value Theory, in particular, suggests that when people are made to feel that they are accepted and valued

by the group they belong, they are likely to perceive procedures (that are used to make decisions) as fair, regardless of whether the decision made is favorable or unfavorable to them (Colquitt, 2001; Colquitt et al., 2001; Greenberg & Colquitt, 2005; Lind & Tyler, 1988). In the context of informational fairness, when employees are provided with explanations and information by their organization on why and how decisions are made, and such information and explanations are truthful, employees are likely to perceive the organization's procedures as fair because they perceive such actions on the part of the organization as a sign that the organization values them and accepts them as an integral part of the organization. Researchers have generally labeled this form of organizational fairness as *informational* fairness (Colquitt, 2001; Colquitt et al., 2001; Greenberg, 1993; Greenberg & Colquitt, 2005). As the consequences of a comprehensive PMS in providing more job-relevant information are consistent with employees' perceptions of *informational* fairness (the provision of explanations and truthful information), *informational* fairness is chosen as the dimension of fairness for our study.

The study of informational fairness is important. While there has been some research in management accounting on issues pertaining to distributive and procedural fairness, no prior management accounting studies have investigated the effects of performance measurement systems on employee perceptions of *informational* fairness or the mechanism by which performance measurement systems influences the extent of job-relevant information which, in turn, influences employees' perceptions of *informational* fairness (Burney et al., 2009; Hartmann & Slapničar, 2009; Lau & Lim, 2002; Libby, 1999, 2001; Lindquist, 1995; Magner & Welker, 1994; Wentzel, 2002). Hence, our study may be the first to provide systematic empirical evidence on the questions of whether and how performance measurement systems affect employees' perceptions of informational fairness. It is also the first empirical study undertaken to compare the effects of comprehensive PMS with those of financial performance measures on informational fairness. A systematic investigation of the effects of financial measures vis-a-vis comprehensive PMS may provide valuable insight into the extent and how the two categories of distinct performance measurement systems affect employees' perceptions of fairness from an informational perspective.

Fig. 1 presents the model used in this study. It proposes that the use of comprehensive PMS is significantly related to the extent of job-relevant information. Job-relevant information is, in turn, related to employees' perceptions of informational fairness. Financial measures are also included in the model. The expectation is that financial measures are not significantly



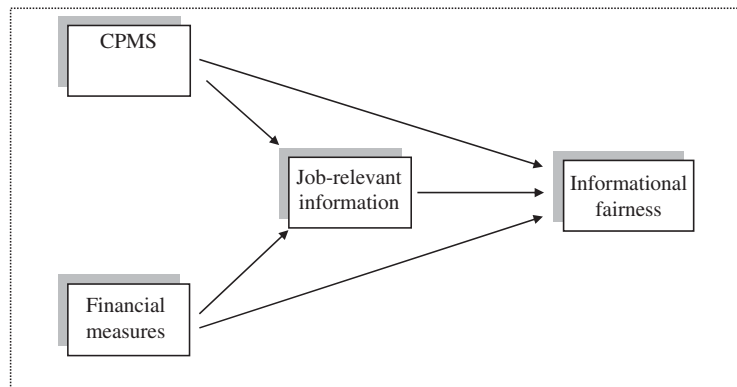


Fig. 1. Conceptual Model.

related to job-relevant information. Hence, while job-relevant information is expected to mediate the relationship between comprehensive PMS and informational fairness, this expectation is not extended to the relationship between financial measures and informational fairness.

The following section discusses the theoretical justification for the hypotheses. This is followed by a presentation of the research method used, including sample selection and measurement of variables. The results of the data analysis are then presented. The final section discusses the findings, conclusions, and limitations.

## HYPOTHESIS DEVELOPMENT

### *Performance Measures (Comprehensive PMS vis-a-vis Financial Measures) and Job-Relevant Information*

Our study compares systematically the effects of financial measures with those of comprehensive PMS. Organizations have traditionally relied on financial measures as the main measures for performance measurement and evaluation. Financial measures such as revenues, costs, budget, and budget variances are used in many organizations as measures of organizational and employee performance. The financial budgets are generally a key component of most organizations' management accounting system and

play a crucial role in the planning, control, performance measurement, and evaluation of organizational functions and activities.

In contrast, a comprehensive PMS encompasses a broader range of performance measures (including both nonfinancial and financial measures) across the value chain and are linked to corporate and strategic business units' strategies. This concept of comprehensive PMS is based on that developed by Hall (2008). Hall (2008, p. 141) defines comprehensive PMS as systems that include "a more diverse set of performance measures that are linked to the strategy of the firm and provide information about parts of the value chain."

The following discussion provides the justification for our expectation that the use of a comprehensive PMS is likely to be associated with a greater extent of job-relevant information than the use of a performance measurement system that relies solely on financial measures. Kren (1992) considers job-relevant information as decision-facilitating information and describes it as information that helps managers to improve his or her action choice through better-informed effort. According to him, employees with job-relevant information are able to function more effectively as they are in a better position to make more effective selection of appropriate courses of action.

Based on Hall's (2008) concept, a comprehensive PMS is different from financial measures in three important aspects. First, a comprehensive PMS is broader than financial measures as it may include both nonfinancial measures and financial measures. Second, the measures are based on the organization's value chain instead of a functional area or a department. Third, they are linked to the organization's strategy. Due to these inherent characteristics, a comprehensive PMS is likely to provide employees with a higher extent of job-relevant information than a system that relies solely on financial measures. As a comprehensive PMS relies on a diverse set of performance measures, comprising both financial and nonfinancial measures that may apply across the value chain, it is likely to provide information across different areas, different dimensions and different components of each unit's operations. Second, as a comprehensive PMS is usually also linked to the organization's and the unit's strategies, it is able to provide information to operating employees on how the various aspects of their and their units' performance are linked to the overall organizational strategy and the overall organizational performance. Hall (2008, p. 144) argues that comprehensive PMS may contain more information because: "... there are several important characteristics of comprehensive performance measurement systems including providing a broad set of measures related to

the important parts of the organization, the integration of measures with strategy and valued organizational outcomes and the integration of measures across functional boundaries and the value chain ... as such a more comprehensive performance measurement system is one that provides *more comprehensive performance information to managers*, i.e., measures that fully describe the strategic business unit's operations and link to strategy and across the value chain" (emphasis added). A comprehensive PMS may therefore assist employees to gain insights into the various key aspects of their unit's operations and strategies.

The use of a comprehensive PMS for performance measurement may also create an environment that leads to the acquisition of more job-relevant information. Because a comprehensive PMS may cover different phases and different areas of a unit's operations, there is likely to be more discussion, more interest and more involvement by employees in all areas of the unit's operations. There may also be more exchange of ideas between superiors and subordinates and among peers and fellow employees. These are likely to lead to a greater understanding of how different parts of a unit operate and are intricately linked together (Fisher, 1992; Hall, 2008). Because a comprehensive PMS may also focus employees' attention on decisions and behavior that contribute to the overall organizational strategy, employees may increase the time spent on evaluating and absorbing the information from a diverse set of performance measures. Employees are required to spend time thinking about how the different components of their units and the different dimensions of tasks in their units are interrelated both within the unit, other departments as well with the overall organizational strategy and objectives.

Moreover, because a comprehensive PMS is less likely to be constrained by the annual financial reporting cycle, information on performance can be both short term and long term. Consequently, more job-relevant information is available when both long-term and short-term considerations are incorporated into the performance measurement system (Fisher, 1992; Kaplan & Norton, 1996). Burney and Widener (2007, p. 46) explain as follows: "A strategic (comprehensive) performance measurement system clarifies and communicate strategic objectives ... it may deliver to the manager a message that while controlling costs is important, so are customer satisfaction and quality. This communication informs the manager that she cannot shirk her responsibilities in either quality or satisfaction to save on costs." There is therefore more information to direct manager attention to both the short-term financial objectives (cost control) as well as the longer-term objectives such as meeting the long-term strategies of the organization.

As a comprehensive PMS may also include nonfinancial measures, it is likely to be more effective in promoting a broader and longer-term outlook among managers. Chenhall (2005, p. 399) states that “the association between strategic performance measurement systems and performance depends on the type of organizational performance being considered, with some evidence suggesting that strategic performance measurement systems are associated with *medium to long-term performance*” (emphasis added). Ittner, Larcker, and Randall (2003, p. 717) note that “one approach to strategic performance measurement is supplementing traditional financial measures with a diverse mix of nonfinancial measures that are expected to capture key strategic performance dimensions that are not accurately reflected in *short-term* accounting measures” (emphasis added). The results of their study indicate that comprehensive PMS are associated with longer-term returns (such as 1 and 3-year stock returns) but not with short-term accounting return (such as return on assets and sales growth). Based on these results, they conclude that “the performance implications of strategic performance measurement systems are more likely to be captured in *forward-looking* stock market measures than in *short-term*, historical accounting measures” (Ittner et al., 2003, p. 738) (emphasis added). In their discussion of the Balanced Scorecard framework, a form of comprehensive PMS, Kaplan and Norton (1996, p. 18) argue that “The Balanced scorecard is a new framework for integrating measures derived from strategy. While retaining financial measures of past performance, the Balanced Scorecard introduces the drivers of *future* financial performance ... Management processes built around the scorecard enable the organization to become aligned and focused on implementing the *long-term* strategy.” Kaplan (1984, p. 414) similarly suggests that “the option to include nonfinancial measures in the firm planning and control system will be more unfamiliar, more uncertain ... It will require them (managers and management accountants) to understand those factors that are most critical to the company’s *long-term* success” (parenthesis and emphasis added).

In contrast, because financial performance measures, including the financial budgets, are generally linked to the annual financial reporting cycle, they are generally much narrower and more constrained than comprehensive PMS. First, as financial measures are usually linked to the annual reporting cycle, they are generally short-term measures of 1 year or less. Performance information of a longer term than 1 year is generally not captured and not reported to the operating units when only financial measures are used for performance measurement and evaluation. In this regard, Fisher (p. 31) notes that: “as managers know ... financial measures reflect the results of

past decisions, not the actionable steps needed for surviving in today's competitive environment." Bol (2008, p. 4) note that "accounting measures, frequently used objective performance measures, are, by nature, backward-looking. Consequently, they do not accurately reflect the effects of employees' actions or decisions on *future* firm value ... Placing high incentive weight on backward-looking objective measures will give rational agents a *short-term* focus which will likely destroy *long-term* company value." Based on their review of the state of management accounting practices in the United States, Johnson and Kaplan (1991, p. 3) observe that: "today's management accounting systems provide a misleading target for managerial attention and fail to provide the relevant set of measures that appropriately reflect the technology, the products, the processes, and the competitive environment in which the organization operates." They attribute this to the short-term focus of financial performance measures and explain as follows: "Today's management accounting information, driven by the procedures and cycle of the organization's financial reporting system ... with increased emphasis on meeting *quarterly or annual* earnings targets ... focus(es) narrowly on producing a *monthly* earnings report ... Managers' horizons contract to the *short-term* cycle of the monthly profit and loss statement ... Typical ... cost accounting systems are helpful neither for product costing nor for operational cost control. The rationalization for their production and existence seems only for the periodic, *usually monthly*, financial reports prepared for senior management .... the problem likely arise from an excessive focus on achieving *short-term* financial performance" (emphasis added).

Similarly, because of the need to comply with accounting standards and regulation, financial measures must necessarily be based on objective evidence, based on historical costs, and cover only what can be measured in monetary terms. Much job-relevant information such as product defect rates, number of innovation, number of new customers acquired, and employee satisfaction rate are not reported by performance measurement systems comprising only financial measures. Moreover, the need to convert all performance into financial terms may result in errors and loss of information because of the translation process. Finally, because financial measures are ultimately expressed in monetary term which can be aggregated, performance measurements based on financial measures are generally quite aggregated, resulting in a loss of job-relevant information. Financial measures such as variable overhead spending variance and variable overhead efficiency variance are not only too technical and complicating for operating employees to comprehend, they are also too aggregated. They may be caused by a very diverse range of items of overhead as well as by many

employees from across several operating units. Hence, they may not be helpful to operating employees in their task completion as they do not reflect the causes of the variances nor are they able to pinpoint who are responsible for the variances. With respect to the variances arising from the typical standard cost systems in the companies included in his study, Fisher (1992, p. 37) observes that: "one of the major weaknesses was the perceived belief that a variance is not actionable at the operating level. The various departments of the plant had difficulty in interpreting a variance and tracing it to a specific problem. Since an unfavorable variance may have multiple causes, causality is often difficult to determine." In order to overcome such limitations of financial measures, he suggests that performance measurement systems which are broadened to include nonfinancial measures are not only "more directly traceable to the strategies of the firm" but may also provide the information which operating level employees could use to act upon. He cites examples of situations where "a drop in quality was quickly determined using nonfinancial measures, so remedial steps could quickly be taken to solve the problem" and when a firm has poor response time to customer order, "the nonfinancial measures of on-time performance would directly address this issue."

From an agency perspective, financial measures are likely to be outcome-based metrics (Fisher, 1992; Hoque, Mia, & Alam, 2001; Kaplan, 1984; Vaivio, 1999). In this regard, Fisher (1992, p. 31) note as follows: "conventional reports about financial performance of a business – whether they are internal reports (e.g., budget or variance report) or external reports ... are much like the scoreboard at a baseball game. A scoreboard tells a player whether he is winning or losing the game, but it tells him little about what he is doing right or wrong ... As managers know ... financial measures reflect the results of past decisions, not the actionable steps needed for surviving in today's competitive environment." Agency theory suggests that information including the extent of job-relevant information is likely to be reduced with outcome-based metrics such as financial performance measures (Conlon & Parks, 1988; Eccles, 1985; Eisenhardt, 1989). The theory further suggests that the agent's opportunism (moral hazard and adverse selection) can be managed by (1) the information system and (2) the form of contract between the agent and the principal. With regard to the information system, when the principal has information from the information system to verify the agent's behavior, the agent is more likely to refrain from acting against the principal's interest. With regard to the form of contract, *outcome-based* contracts may be effective in curbing agents' opportunism than behavior-based contracts. According to Eisenhardt (1989),

when a contract is outcome based, risk is effectively transferred from the principal to the agent. Consequently, the agent is more likely to behave in the interest of the principal because the rewards for both the agent and the principal depend on the same actions.

Since an *outcome-based* contract such as those based on financial measures may curb the agent's opportunism, there will be less need for the principal to rely on a sophisticated (comprehensive) information system to monitor the agent's behavior. Conversely, when the contract is behavior based, the principal may need to invest in a more sophisticated (comprehensive) information system to monitor the agent's behavior. Both Eisenhardt (1989) and Conlon and Parks (1988) found that information systems were *negatively* related to *outcome-based* evaluation systems. There is therefore research evidence to support the contention that the level of sophistication (comprehensiveness) of the information system is *negatively* associated with the *outcome-based* contracts such as those based primarily on financial metrics. It is therefore reasonable to expect that when employee performance evaluation is based on outcome-based metrics such as *financial measures* (Fisher, 1992; Hoque et al., 2001; Kaplan & Norton, 1992; Vaivio, 1999), the performance measurement system is likely to be *less* comprehensive and, hence, contains *less* job-relevant information. In contrast, when employee performance evaluation is based on *comprehensive performance measures*, the performance measurement system is likely to be *more* comprehensive and, hence, contains *more* job-relevant information.

Based on the above discussion, the expectation is that performance measurement systems that are comprehensive are likely to be associated with a high extent of job-relevant information. In contrast, performance measurement systems based only on financial measures may not be associated with a high extent of job-relevant information. We therefore propose:

**H1.** The use of performance measurement systems that are *comprehensive* is positively related to the extent of job-relevant information.

**H2.** The use of performance measurement systems that rely only on *financial measures* is not related to the extent of job-relevant information.

#### *Job-Relevant Information and Employees' Perceptions of Informational Fairness*

This section discusses the theoretical justification for the expectation that job-relevant information may be positively associated with employees'



perception of fairness, specifically, their perceptions of *informational* fairness. Employees' perceptions of fairness in the workplace are important (Colquitt, 2001; Greenberg, 1993; Lind & Tyler, 1988). Hence, research on the effects of performance measurement systems on employees' perceptions of fairness contributes to the performance management system literature (Burney et al., 2009; Hartmann & Slapničar, 2009; Lau & Moser, 2008). However, since there are different dimensions of organizational fairness, it is important for research on organizational fairness to specify which dimension of fairness is being studied. Otherwise, the theoretical arguments and results may be confusing.

The organizational justice literature contends that *fairness is not a single construct*. There are several dimensions of fairness. First, there is the distinction between distributive fairness and procedural fairness (Colquitt et al., 2001; Lind & Tyler, 1988; Thibaut & Walker, 1975). Procedural fairness, in turn, comprises three dimensions, namely, structural procedural fairness, interpersonal fairness, and informational fairness (Bies & Moag, 1986; Colquitt, 2001; Colquitt et al., 2001; Greenberg, 1993; Greenberg & Colquitt, 2005; Shapiro, Buttner, & Barry, 1994). Distributive fairness refers to the fairness of outcomes people received or the decisions that have been made. In other words, distributive fairness refers to how fair are the outcomes or how fair are the decisions made (Adams, 1965). In contrast, procedural fairness (comprising structural procedural fairness, interpersonal fairness and informational fairness) is not directed at the outcomes or the decisions made. Instead, it relates to how fair are the procedures or processes used to make allocations and decisions. First, structural procedural fairness refers to the perceived fairness of the *technical characteristics of procedures* such as the degree of process control, accuracy of information, consistency in application of procedures across individuals and time, correctibility of incorrect decisions, representativeness and bias suppression (Leventhal, 1980). Second, interpersonal fairness refers to *the degree of politeness, respect, and propriety* by which organizations and supervisors treat employees (Greenberg, 1993). Third, informational fairness is based on *the amount of information and the truthfulness of such information* that organizations and supervisors are willing to provide to employees (Bies & Moag, 1986; Colquitt, 2001; Colquitt et al., 2001; Greenberg, 1993; Shapiro et al., 1994).

As there are four dimensions of fairness, it is important to identify the specific dimension of fairness that the independent variables investigated in our study are theoretically associated with. Our study investigates the relationships between comprehensive PMS vis-a-vis financial measures and



employees' perceptions of fairness. It is highly unlikely that the use of comprehensive PMS vis-à-vis financial measures and job-relevant information can be theoretically linked to *all four dimensions of fairness* because an argument that is made for one dimension of fairness (e.g., distributive fairness) may be contrary to another dimension of fairness (e.g., informational fairness). As the theoretical justifications for the relationships between job-relevant information and distributive fairness, structural procedural fairness and interpersonal fairness are unclear, these three dimensions of fairness are *not* included in this research. Consequently, our study focuses only on *informational* fairness. We base our selection of informational fairness on the following premises.

Organizational justice theories suggest that people's judgments of fairness are influenced by (1) instrumental effects and (2) noninstrumental effects. Instrumental effects refer to people's perceptions of fairness that are based on how procedures fulfill their self-interests (Colquitt et al., 2001; Lind & Tyler, 1988; Lindquist, 1995; Thibaut & Walker, 1975). The *Self-Interest Theory* developed by Lind and Tyler (1988) suggests that people perceive procedures that *fulfill their self-interests* in the long term as *fair* because these procedures get them what they want (even if they may have to compromise in the short term). In contrast, noninstrumental effects of fairness refer to people's perceptions of fairness based on how they are treated by others in the groups to which they belong to. The *Group Value Theory* developed by Lind and Tyler (1988) suggests that humans are affiliative creatures and want to be accepted by the groups (collectives) they belong to. As they want to belong to groups, they are likely to perceive greater fairness in those groups' procedures that make them feel that they are *accepted* and *valued* by the groups they belong to. In other words, procedures *with* characteristics and attributes which make an individual feel that he or she is valued and accepted by the group are perceived as *fair*. In contrast, procedures *without* any characteristics and attributes to make a group member feel that he or she is valued and accepted by the group are perceived as *unfair* (Colquitt et al., 2001; Greenberg & Colquitt, 2005; Greenberg, 1993; Lind & Tyler, 1988).

*Informational* fairness, the dimension of fairness of our study, is consistent with the *non-instrumental* effects of fairness. It was first introduced by Greenberg (1993) and is based on the Group Value Theory of organizational justice developed by Lind and Tyler (1988). According to Greenberg (1993), informational fairness is engendered by two specific aspects of information communicated by group leaders to individual group members. The first aspect is the *amount* of information and explanations group leaders

are willing to disclose to individual group members for key decisions made about the group. The second aspect relates to the *truthfulness* of such information and explanations provided to individual group members. Colquitt (2001, p. 390) similarly states that justifications or explanations (explaining the basis of decisions made) and truthfulness (an authority figure being candid and not engaging in deception) as the two key determinants of employees' perceptions of informational fairness. The disclosure of a greater amount and more truthful information and explanations indicates openness and transparency on the parts of the group leaders. It also indicates that group leaders are taking individual group members into their confidence by reducing secrecy and dishonesty (Colquitt, 2001). Finally, it demonstrates the willingness of group leaders to involve and engage individual group members in the key activities and decision making of the group. In such situation, individual group members are likely to feel that they are valued and accepted by their group leaders and their group. Consequently, they are likely to perceive their group's procedures as informationally fair.

Our research investigates the effects of comprehensive PMS vis-a-vis financial measures on informational fairness via job-relevant information. Hence, it is necessary for our research to ascertain if the provision of a greater extent of job-relevant information from the use of a comprehensive PMS (as hypothesized in hypotheses H1) is in accordance with the conditions of high informational fairness. Based on the concept of informational fairness as developed in the organizational justice literature (Bies & Moag, 1986; Colquitt, 2001; Colquitt et al., 2001; Greenberg & Colquitt, 2005; Greenberg, 1993; Shapiro et al., 1994), informational fairness is perceived as high under these two conditions: (1) when supervisors are willing to disclose information (explanations and justifications) to employees for key decisions made and (2) when supervisors are truthful in providing such information.

Hence, to assess informational fairness, the criteria are (1) *the amount of information* provided to employees and (2) the extent of *truthfulness* in the information provided to employees. With regard to the first condition (a greater extent of information), our study hypothesizes that comprehensive PMS are associated with a greater amount of job-relevant information than systems based only financial measures (see H1 and H2 in previous section). In this section, we hypothesize that a greater amount of job-relevant information, in turn, is likely to be associated with a higher level of informational fairness because more job-relevant information means the provision of more information and explanations to employees. First, job-relevant

information, through the provision of task-related information and feedback, enables employees to understand their tasks, their responsibilities and how their jobs are relate to other aspects of their unit and their organization. Kren (1992, p. 512) suggests that job-relevant information “provides the manager with a better understanding of decision alternatives and actions needed to reach objectives.” Hence, job-relevant information improves employees’ understanding of their tasks and roles and ultimately their organization including a better understanding of the decision-making processes of their organization. With a better understanding of the organizational decision-making processes, employees are likely to be in a better position to understand and appreciate the rationales and justifications on why and how decisions that affect them are made. Job-relevant information may lead to greater employees’ involvement in the organizational decision-making processes. Job-relevant information not only facilitates effective task completion and performance, it also enhances employees’ understanding of the various aspects of their tasks, their responsibilities, their work situations, and their work environment. Employees in such situations are likely to be in a far better position to participate and be involved in key aspects of the organizations’ affairs and decision making. Organizations and supervisors are also likely to be more willing to involve employees in decision making when employees are well informed and knowledgeable of their tasks and work situations. Employees, who are involved in their organizations’ decision-making processes because of their greater understanding of their jobs, may experience a greater sense of acceptance by their superiors and their organization.

More importantly, the provision of more job-relevant information to employees conveys to the employees the message that their organization and their supervisors *value* them and *accept* them as an integral part of the group (organization). As discussed previously, the organizational fairness literature suggests that humans are affiliative creatures and want to belong to groups (collectives) (Lind & Tyler, 1988). They want to feel “accepted” and “valued” by the group (Colquitt, 2001, p. 391). However, not everyone is accepted and valued by the group. How do employees in an organization know if they are accepted and valued by the organization (group) they belong to? Colquitt (2001, p. 391) argues that the amount of information provided by organization reflects “the extent to which a person feels he or she is valued by the collective.” The organizational fairness literature suggests that the involvement of employees in key decision making requires the disclosure of more information by the organization to those taking part in the decision making. It also suggests that the organization and group

leaders generally only allow people whom they *accept* and *value* to participate in the key decision making of the group (Bies & Moag, 1986; Colquitt, 2001; Colquitt et al., 2001; Greenberg & Colquitt, 2005; Greenberg, 1993; Shapiro et al., 1994). Consequently, when the organization and the superiors disclose more information to employees, they signal to the employees that they (the organization and the superiors) want the employees to participate in the key decisions of the organization. It also follows that if an organization and the superiors want employees to participate in key decisions, the organization and the superiors accept and values the employees. In this regard, Colquitt (2001, p. 395) note that: “in the know connotes *being in the in-group*”. Hence, when more job-relevant information is provided to employees (through a comprehensive PMS), it conveys to employees that the organization accepts them and values them as an important component of the organization and wants to involve them in its key decision making. Consequently employees’ perceptions of informational fairness are likely to be high.

The second condition of informational fairness is truthfulness in the information provided. Colquitt (2001, p. 390) notes that truthfulness refers to “an authority figure being candid and not engaging in deception.” *The disclosure of confidential and truthful information by the group and group leaders to an individual is therefore a signal that the individual is valued and accepted by the group.* In the context of our research, when the organization (group) and the superiors (group leaders), through comprehensive PMS, provide more job-relevant information to their employees, they are sending a clear message to the employees that they (the organizations and the superiors) are being truthful because they are taking their employees into their confidence by disclosing confidential information to them. Moreover, by engendering a greater understanding of tasks and work situations among employees, job-relevant information exposes the organizational decision-making processes to scrutiny and hence reduces dishonesty and secrecy. Employees with a high extent of job-relevant information are likely to be able to detect dishonest and untruthful justifications and explanations for decisions made for their units. They are therefore likely to be in a better position to expect and ask for truthful information and justifications. Hence, in situations where job-relevant information is high, supervisors are likely to find it very difficult to be deceitful, dishonest and not transparent. Employees in such situations are likely to perceive that they have been adequately informed with truthful explanations on how decisions are made.

In summary, the discussion above suggests that when an organization (through a comprehensive PMS) provides a greater amount of job-relevant

information to its employees, the information is likely to facilitate greater employees' involvement in organizational decision making and better employees' appreciation of the rationales and justifications for key decisions made. This is likely to engender feelings among employees that their organization is providing them with a high extent of truthful information and explanations about their organization. These outcomes support the expectation that job-relevant information is an effective means to promote communication and truthfulness between the organization and its employees. These effects of job-relevant information are likely to engender a feeling of well-being among the employees including a belief that their organization is benevolent. More importantly, they may engender a feeling among the employees that their organization and their superiors value them and accept them as an integral and important part of the organization. Consequently, they are likely to perceive a high level of fairness in their organization's procedures. When perceptions of fairness are brought about by employees' feelings of acceptance by their organization through the provision of more truthful information, the form of fairness is labeled as informational fairness (Bies & Moag, 1986; Colquitt, 2001; Colquitt et al., 2001; Greenberg & Colquitt, 2005; Greenberg, 1993; Shapiro et al., 1994). Accordingly, we propose:

**H3.** Job-relevant information is positively related to employees' perceptions of *informational* fairness.

*Job-Relevant Information as an Intervening Variable between  
Comprehensive PMS and Informational Fairness*

The previous section of the paper proposes in H1 that comprehensive PMS is positively related to job-relevant information. H3 further suggests that job-relevant information is, in turn, positively related to employees' perceptions of informational fairness. These relationships suggest that the effects of comprehensive PMS on informational fairness are indirect via job-relevant information. In contrast, the expectation is that financial measures are not significantly related to job-relevant information (see H2). Hence, the relationship between financial measures and informational fairness is not expected to be mediated by job-relevant information. We therefore propose:

**H4.** The relationship between comprehensive PMS and employees' perceptions of informational fairness is indirect and is mediated by job-relevant information.

**H5.** The relationship between financial performance measures and employees' perceptions of informational fairness is not mediated by job-relevant information.

## RESEARCH METHOD

### *Sample Selection and Data Collection*

A mail questionnaire survey was used to collect the data. The participants were selected from organizations listed in the *Kompass Australia* database. In order to provide some degree of control for industry effects, only organizations from the manufacturing sector were included in the study. Similarly, in order to provide some degree of control over the size of organizations, the selection criteria of (1) a minimum of 100 employees and (2) an annual turnover of more than Australian \$10 million, were used. Based on these criteria, 653 manufacturing organizations qualified for selection. In order to keep the sample of organizations to a manageable size, a selection interval of 4 was used to randomly select a total of 163 organizations (25% of the total qualified organizations).

All 163 organizations were contacted by telephone calls to seek their assistance to participate in the research. Only 121 organizations were willing to participate. As it would be impracticable for the organizations to provide us with a full list of their employees, the organizations were requested to provide the researchers with the names of no more than six employees from generally middle-level management employees with some supervisory responsibilities in the production and marketing functions. The names of a total of 500 employees were obtained from the 121 organizations.

A questionnaire together with a covering letter (explaining the purpose of the research and assuring confidentiality of responses) and a prepaid reply envelope to the researchers were mailed to each selected employees. A follow-up reminder letter was sent to each participant two weeks after the initial mailing of the questionnaire set. Forty-seven unopened questionnaire sets were returned to the researchers as return to sender stating that the selected participants were no longer working in the organizations or that the addresses were incorrect. One hundred and eight completed responses were received. Four were incomplete. This results in 104 useable responses.

Based on the number of responses received and the number of questionnaire mailed and received by the intended participants, the response rate is approximately 24%. This response rate is comparable with some prior management accounting studies (e.g., Baines & Langfield-Smith, 2003; Hall, 2008) involving surveys of departmental supervisors in Australian manufacturing organizations.

In order to test for nonresponse bias, the approach suggested by Oppenheim (2001) whereby the responses of the early respondents were compared with those of the late respondents was undertaken. No significant differences were found for any of the variables investigated between the early responses and late responses. These results provide some assurance that nonresponse bias may not be an issue with the data set.

The demographic data indicate that the average respondent in the sample had held his or her position for an average of 12 years, was responsible for an average of 49 employees and was, on average, 47 years of age. Most respondents (87%) held at least a vocational, tertiary, or professional qualification. These demographic data provide some assurance that the respondents were generally well-qualified and experienced employees with important responsibilities in their organizations.

### *Measurement of Variables*

#### *Comprehensive PMS*

The variable comprehensive PMS is measured by the instrument developed by Hall (2008). The instrument comprises nine items. Five of the items relate to the extent to which the respondents' organizational PMS are able to provide a broad and diverse range of information on different areas and different dimensions of the respondents' units of operation. The other four items are based on the instrument developed by Chenhall (2005) which relate to the extent to which the organizational PMS are able to link the unit performance to the organizational strategies and long-term goals. For example, respondents are asked to rate on a seven-point Likert-scale on whether they agree or disagree if their organizational PMS (1) provides a diverse set of measures related to key performance areas of their work units; (2) provides a broad range of performance information about different areas of their units; and (3) provides consistent and reinforcing links between the current operating performance of their units and the long-term strategies of their organization. Hall (2008) tested and found satisfactory psychometric properties for the instrument.



*Financial Measures*

This variable is measured by a five-item instrument developed by Lau and Moser (2008). The question asks “When your superior is evaluating your performance, how much importance do you think he or she attaches to the following items?” Participants are required to respond to a seven-point Likert scale ranging from “1 – never important” to “7 – always important.” The financial measures items are: (1) My ability to meet my budget; (2) my ability to avoid unfavorable budget variances; (3) My ability to meet or better budgeted costs or sales; (4) My ability to achieve budgeted cost reduction or budgeted sales growth; and (5) My ability to achieve financial targets.

*Job-Relevant Information*

This variable is measured by the instrument developed by Kren (1992) with the objective to ascertain the extent of information the respondents perceive that they have for job-related decisions. The three items include whether the respondents (1) are clear about what is necessary to perform their jobs well, (2) have adequate information to make optimal decisions, and (3) are able to obtain strategic information. This instrument has since been used by several management accounting studies (e.g., Burney & Widener, 2007; Leach-Lopez, Stammerjohan, & McNair, 2007). The instrument was tested and found to have satisfactory psychometric properties by Kren (1992) and the subsequent studies that used this instrument.

*Informational Fairness*

This variable is measured by the instrument developed by Colquitt (2001). The instrument comprises five items derived from prior studies on organizational fairness including Bies and Moag (1986) and Shapiro et al. (1994). The first item is on truthfulness and seeks to ascertain the extent to which the respondents’ superiors have been candid in their communication. The other four items are on justification and explanation. They include the extent to which the respondents’ superiors have provided explanations to procedures, explained procedures thoroughly, communicate details in a timely manner, and tailored communication to individual’s specific needs. The instrument was tested thoroughly by Colquitt (2001) including comparisons of multiple a-prior factor structures (one-factor, two-factor, three-factor, and four-factor conceptualization), and examination of outcomes associations with the fairness constructs to demonstrate predictive validity. The instrument was also subjected to two independent studies to test for construct validity.



## RESULTS

Structural equation modeling based on the partial least squares (PLS) method is used for hypothesis testing in this study. This technique has been used extensively in recent management accounting studies (Hall, 2008; Hartmann & Slapničar, 2009). The approach estimates the structural model using an iterative OLS regression-like procedure, which calculates the variance of the latent and/or observed-dependent variables by minimizing their residual variances, using minimal assumptions about the data distribution and sample size thus making it appropriate for the purposes of this study (Wold, 1985).

### *Measurement Model*

PLS uses a measurement model and a structural model. The measurement model explains the links between observed items and latent variables. The structural model assesses relations between latent constructs. While both the measurement and structural models are estimated simultaneously in PLS, interpretation of the results is a two-step process. First, the measurement model ascertains if the constructs' measures are reliable and valid before assessing the nature of the relationships among the constructs. The analysis and interpretation of the measurement model include analyzing individual item reliability, construct reliability, and convergent and discriminant validity for all reflective constructs.

Results of the initial measurement model for analyzing individual item reliability are analyzed first. Individual item reliability occurs when an item has factor loading of 0.5 and above on its respective construct (Nunnally & Bernstein, 1994). The factor loadings results for all the indicators of the variables as presented in Table 1 show that all are above 0.5. They range between 0.70 and 0.97. These results indicate that individual item reliability is satisfactory for the variables in the study.

In terms of construct reliability, the rules of Fornell and Larcker (1981) based on the measures of composite reliability and Cronbach alpha are used to assess the reliability of each latent variable. Ideally, the composite reliability score should exceed 0.7 (Vandenbosch, 1996) and the Cronbach alpha score should exceed 0.8 (Nunnally & Bernstein, 1994) for each latent variable. The results in Table 1 indicate that the composite reliability scores are all in excess of 0.9. These are all well above 0.7 threshold. The Cronbach alpha scores are also all in excess of the 0.8 threshold, ranging

**Table 1.** Estimation of the Measurement Model Parameters ( $n = 104$ ).

Constructs	Loadings	T-Statistics	Significance Level	Cronbach Alpha	Composite Reliability	AVE
<i>Comprehensive PMS</i>						
CPMS1	0.732	13.334	0.001	0.950	0.958	0.719
CPMS2	0.711	10.371	0.001			
CPMS3	0.886	30.189	0.001			
CPMS4	0.872	32.084	0.001			
CPMS5	0.886	30.535	0.001			
CPMS6	0.907	39.133	0.001			
CPMS7	0.910	39.499	0.001			
CPMS8	0.806	20.267	0.001			
CPMS9	0.890	36.725	0.001			
<i>Financial measures</i>						
FIN1	0.960	4.224	0.001	0.930	0.931	0.732
FIN2	0.837	3.934	0.001			
FIN3	0.795	3.571	0.001			
FIN4	0.870	4.670	0.001			
FIN5	0.804	3.907	0.001			
<i>Job-relevant information</i>						
JRI1	0.871	30.091	0.001	0.858	0.913	0.779
JRI2	0.902	32.272	0.001			
JRI3	0.874	36.921	0.001			
<i>Informational fairness</i>						
IFF1	0.700	8.509	0.001	0.874	0.910	0.672
IFF2	0.896	41.560	0.001			
IFF3	0.908	45.010	0.001			
IFF4	0.869	32.378	0.001			
IFF5	0.698	8.589	0.001			

between 0.858 and 0.95. These results indicate acceptable construct reliability for the variables used in the model (Nunnally & Bernstein, 1994; Vandenberg, 1996).

With regard to validity, both convergent and discriminant validity for the constructs are assessed based on the average variance extracted (AVE). The AVE represents the average variance shared between a construct and its indicators (Fornell & Larcker, 1981). The threshold of AVE for convergent validity is 0.5 and above (Vandenberg, 1996). The results in Table 1 indicate that the AVEs for all variables are greater than 0.5 ranging between 0.672 and 0.779. These results indicate that convergent validity exists for all constructs (Chin, 1998).

Discriminant validity of the constructs is assessed next. Two tests are undertaken. First, discriminant validity of constructs is found to be adequate as shown by the square root of the AVE statistics (diagonal AVE values in Table 3) compared with the correlations among the latent variables. These results indicate that each construct shares more variance with its own indicators than with other constructs (Fornell & Larcker, 1981). Second, when assessing discriminant validity, each indicator's cross-loadings onto other constructs should be negligible. Cross loadings are calculated based on correlating the component scores of each latent variable with all the other items (Chin, 1998). The results in Table 2 indicate that the loading of each item *within* its corresponding latent construct is higher than those of items from *other* latent constructs both horizontally and vertically. Overall, based on the results in Tables 1, 2, and 3, the PLS measurement model indicates satisfactory individual item reliability, construct reliability, convergent validity, and discriminant validity for the variables of this study.

**Table 2.** Discriminant Validity Test: Cross Loadings.

Construct	Indicators	CPMS	FIN	JRI	IFF
<i>Comprehensive PMS</i>	CPMS1	<b>0.732</b>	0.378	0.385	0.408
	CPMS2	<b>0.711</b>	0.296	0.242	0.287
	CPMS3	<b>0.886</b>	0.345	0.361	0.354
	CPMS4	<b>0.872</b>	0.345	0.420	0.465
	CPMS5	<b>0.886</b>	0.346	0.418	0.365
	CPMS6	<b>0.907</b>	0.305	0.399	0.334
	CPMS7	<b>0.910</b>	0.334	0.407	0.295
	CPMS8	<b>0.806</b>	0.277	0.296	0.334
	CPMS9	<b>0.890</b>	0.344	0.339	0.345
<i>Financial measures</i>	FIN1	0.359	<b>0.960</b>	0.252	0.147
	FIN2	0.360	<b>0.837</b>	0.028	0.045
	FIN3	0.358	<b>0.795</b>	0.033	-0.026
	FIN4	0.362	<b>0.840</b>	0.115	0.073
	FIN5	0.314	<b>0.804</b>	0.038	0.020
<i>Job-relevant information</i>	JRI1	0.386	0.181	<b>0.871</b>	0.543
	JRI2	0.393	0.073	<b>0.902</b>	0.433
	JRI3	0.375	0.239	<b>0.874</b>	0.526
<i>Informational fairness</i>	IFF1	0.302	0.064	0.424	<b>0.700</b>
	IFF2	0.403	0.146	0.524	<b>0.896</b>
	IFF3	0.358	0.095	0.535	<b>0.908</b>
	IFF4	0.338	0.099	0.509	<b>0.869</b>
	IFF5	0.340	0.047	0.308	<b>0.698</b>

**Table 3.** Discriminant Validity Coefficients and Square Root of AVE.

	CPMS	FIN	JRI	IFF
CPMS	<b>0.848</b>			
FIN	0.392	<b>0.856</b>		
JRI	0.436	0.190	<b>0.882</b>	
IFF	0.424	0.115	0.571	<b>0.820</b>

CPMS = Comprehensive performance measurement systems, FIN = Financial measures, JRI = Job-relevant information, IFF = Informational fairness.

### *Structural Model*

The structural model results are presented and interpreted next. The structural model is evaluated by testing (1) the coefficient of determination ( $R^2$ ) and (2) the strength and direction of the path coefficients (Urbach & Ahlemann, 2010). The  $R^2$  is a prediction-oriented measure. It calculates the relationship between a latent construct's explained variance and its total variance (Chin, 1998; Ringle & Hansmann, 2004). A high (low)  $R^2$  indicates high (low) predictive power for the structural model. The results in Fig. 2 show that the  $R^2$  for job-relevant information as explained by comprehensive PMS and financial measures is 19%. The  $R^2$  for informational fairness as explained by financial measures, Comprehensive PMS (CPMS), and job-relevant information is 37%. These results indicate that the use of financial performance measures and the use of comprehensive PMS are able to explain 19% and 37% of the variation of job-relevant information and informational fairness, respectively. These indicate relatively strong  $R^2$  (Cohen, 1988; Ringle & Hansmann, 2004) and compare favorably with other management accounting studies of around 15% (e.g., Emsle, 2005; Kren, 1992; Mia & Chenhall, 1994). Higher  $R^2$  are not expected because employee job-relevant information and informational fairness are likely to be affected by many other variables apart from those included in our model.

Next, the structural model is evaluated by testing the strength and direction of the path coefficients (Urbach & Ahlemann, 2010). Statistical significance of the parameter estimates is based on a bootstrap procedure with 1,000 replacements (Efron & Tibshirani, 1993; Hartmann & Slapničar, 2009). Fig. 2 presents the path coefficients of the structural model. They indicate the following. First, with regard to comprehensive PMS, the path between comprehensive PMS and job-relevant information is positive and highly significant (est. = 0.427,  $p < 0.01$ ). These results provide support for

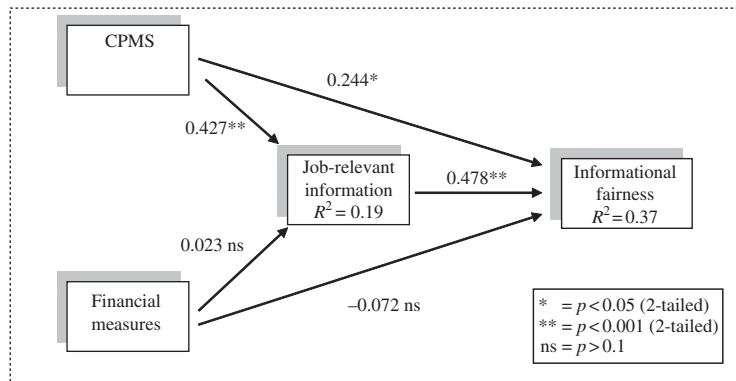


Fig. 2. Comprehensive Performance Measurement Systems (CPMS), Financial Measures, Job-Relevant Information and Informational Fairness: Path Coefficients.

H1 which states that the use of PMS that are comprehensive is positively related to job-relevant information. Second, the results indicate that job-relevant information is, in turn, positively and significantly related to informational fairness (est. = 0.478,  $p < 0.01$ ). These results support H3 which states that job-relevant information is positively related to informational fairness.

The results for financial measures are analyzed next. H2 states that the use of performance measurement systems that rely only on financial measures is not related to the extent of job-relevant information. The results in Fig. 2 show that financial measures are not significantly related to job-relevant information (est. = 0.023,  $p > 0.1$ ). H2 is therefore also supported.

H4 states that the relationship between comprehensive PMS and informational fairness is indirect and is mediated by job-relevant information. In contrast, H5 states that the effects of financial measures on informational fairness are not mediated by job-relevant information. In order to test for these two hypotheses, it is necessary to ascertain the direct effects and indirect effects of comprehensive PMS and financial measures on informational fairness. First, based on path coefficients presented in Fig. 2, the direct and indirect effects of comprehensive PMS are ascertained as follows and presented in Table 4:

$$\text{Indirect effect of via job-relevant information} = 0.427 \times 0.478 = 0.204$$

$$\text{Direct effect of comprehensive PMS on informational fairness} = 0.244$$

**Table 4.** Structural Model – Direct and Indirect Effects.

Dependent Variables	Independent Variables	Hypotheses	Direct Effects	t-Values	Significance Levels	Indirect Effects	Spurious Effects	Total Effects
Job-relevant information	CPMS	H1	0.427	4.217	0.01	0	0.009	0.436
	Financial measures	H2	0.023	0.131	ns	0	0.168	0.191
Informational fairness	CPMS	H4	0.244	2.486	0.01	0.204	-0.024	0.424
	Financial measures	H5	-0.072	0.715	ns	0.011	0.176	0.115
	JRI	H3	0.478	5.107	0.01	0	0.093	0.571

ns = not significant ( $p > 0.1$ ).

In order to ascertain if the indirect effect of comprehensive PMS on informational fairness is meaningful, the criterion suggested by Pedhazur (1982) and Bartol (1983) is used. These two researchers suggest that for an indirect effect to be meaningful, the absolute amount of the effect (the product of the standardized path coefficients) needs to be at least 0.05. Since the indirect effect of comprehensive PMS on informational fairness as computed above is 0.244 and is way above the meaningful threshold of 0.05, the indirect effect is meaningful.

A second test is undertaken to ascertain if job-relevant information mediates the relationship between comprehensive PMS and informational fairness. Baron and Kenny (1986, p. 1177) suggest that for mediation to occur, three conditions must hold. First, the independent variable must be significantly related to the dependent variable. Second, the independent variable must significantly affect the mediating variable. Finally, the mediating variable must, in turn, significantly affect the dependent variable. Our results for comprehensive PMS provide support for all three conditions. First, comprehensive PMS is significantly related to informational fairness. The zero-order correlation between comprehensive PMS and informational fairness is 0.424 ( $p < 0.01$ ). Second, comprehensive PMS significantly affect job-relevant information (est. = 0.427,  $p < 0.1$ ; see Fig. 2). Third, job-relevant information is, in turn, significantly related to informational fairness (est. = 0.478;  $p < 0.01$ ; see Fig. 2). These results provide support for H4 that job-relevant information mediates the relationship between comprehensive PMS and informational fairness. In order to ascertain if the mediation is full or partial, the criterion suggested by Baron and Kenny (1986) is used. This criterion states that if a significant relationship between the independent variable and the dependent variable becomes insignificant after controlling for the indirect effect, the mediating variable is deemed to have a full-mediating effect. However, if a significant relationship between the independent variable and the dependent variable remains significant after the indirect effect has been partialled out, the mediating variable is deemed to have a partial mediating effect. For our study, the results indicate that the zero-order correlation for the relationship between comprehensive PMS and informational fairness is significant ( $p < 0.01$ ). The results in Fig. 2 also indicate that the path coefficient for the path between comprehensive PMS and informational fairness is still significant (est. = 0.244,  $p < 0.05$ ) after the indirect effect via job-relevant information have been controlled for. Hence, the mediation is only partial.

Overall, the results for comprehensive PMS suggest the following. First, comprehensive PMS significantly affect employees' perceptions of

informational fairness (est. = 0.425,  $p < 0.01$ ). Second, these effects are both direct (direct effect = 0.244,  $p < 0.05$ ) and indirect via job-relevant information (indirect effect = 0.204). Third, job-relevant information partially mediates the relationship between comprehensive PMS and employees' perceptions of informational fairness. H4 is therefore partially supported.

With regard to the relationship among financial measures, job-relevant information and informational fairness, the results are as follows. First, the zero-order correlation between financial measures and informational fairness is not significant (est. = 0.114,  $p > 0.1$ ). Second, based on path coefficients presented in Fig. 2, the direct and indirect effect of financial measures on informational fairness are ascertained as follows:

Indirect effect of via job-relevant information =  $0.023 \times 0.478 = 0.011$

Direct effect of financial measures on informational fairness =  $-0.072$

These results indicate that financial measures are not significantly related to informational fairness (est. = 0.0114,  $p > 0.1$ ). Second, since the absolute amount of the indirect effect is only 0.011, which is way below the meaningful threshold of 0.05, the indirect effect is not meaningful (Bartol, 1983; Pedhazur, 1982). Moreover, the relationship between financial measures and job-relevant information is also not significant (est. =  $-0.072$ ,  $p > 0.1$ ; see Fig. 2). Hence, the relationship between financial measures and informational fairness is not mediated by job-relevant information. H5, which states that the relationship between financial measures and informational fairness is not mediated by job-relevant information, is therefore supported.

## CONCLUSION

This study investigates the relationships between performance measurement systems (comprehensive PMS and financial measures) and employees' perceptions of fairness, specifically, informational fairness. Survey responses from 104 employees with supervisory responsibilities are used. SEM-PLS is used to analyze the data.

The research has several purposes. The first is to investigate the issue of fairness associated with performance measurement systems. It addresses the question of whether comprehensive PMS affect employees' perceptions of fairness. The second purpose is to examine the mechanism by which comprehensive PMS affect employees' perceptions of fairness. Specifically, it attempts to answer the question of whether the effects of comprehensive



PMS on employees' perceptions of fairness are direct or indirect via job-relevant information. The third purpose is to develop a more refined model to investigate employees' fairness perceptions. Prior management accounting research that focuses on fairness issues has generally conceptualized procedural fairness as a single construct. There have been suggestions that procedural fairness may comprise several dimensions. Our research focuses on the dimension of fairness, namely, *informational fairness*, that is, most appropriate for the chosen independent (comprehensive PMS) variable and the chosen intervening variable (job-relevant information) in order to produce a more refined model for investigation. Importantly, the last purpose is to ascertain if the effects on as well as the mechanism by which comprehensive PMS affect employees' perceptions of informational fairness are similar or different from those of financial measures. This will assist organizations in their decisions on the choice of performance measurement systems.

The results are as follows. With regards to comprehensive PMS, the results indicate that comprehensive PMS are positively and significantly related to informational fairness. Second, comprehensive PMS are also positively and significantly related to job-relevant information. Third, job-relevant information is, in turn, positively and significantly related to informational fairness. With respect to financial measures, the results indicate that financial measures have no significant effects on job-relevant information. They also do not have any significant effect on employees' perceptions of informational fairness.

Based on these results, it is possible to conclude as follows. Comprehensive PMS have two beneficial employee outcomes. First, they engender job-relevant information. Second, they enhance employees' perceptions of informational fairness. With respect to the mechanism by which performance measurement systems influence informational fairness, comprehensive PMS have direct effects on employees' fairness perceptions. They also have indirect effects on employees' fairness perceptions through job-relevant information. Hence, job-relevant information mediates the relationship between comprehensive PMS and informational fairness. The mediation is partial since the direct effect of comprehensive CPM on informational fairness is significant. With respect to financial measures, these measures do not engender job-relevant information. They also do not enhance employees' perceptions of informational fairness.

This study's findings and conclusions may have important practical and theoretical implications. From a practical perspective, the findings and conclusions suggest that choice of performance evaluation criteria, specifically,

comprehensive PMS vis-a-vis financial measures, may have profound effects on employees' reactions. Hence, the choice of performance measures should not be approached solely from the organizational perspective, but also from employee perspective as well. From a theoretical perspective, this research contributes by informing the current debate on the performance measures and performance measurement systems. The findings support a strong association between comprehensive PMS and employees' fairness perceptions. The study also develops a more refined model to explain the mechanism by which PMS influences employees' fairness perceptions. It approaches the research questions from an informational perspective by addressing only the informational effects of performance measurement systems and focusing only on job-relevant information as the intervening variable, and informational fairness as the dependent variable. Such an approach may be of importance to future management accounting research on fairness issues. Colquitt (2001, p. 396) concludes as follows: "Disagreement over the factor structure of organizational justice ... have hindered theoretical and practical advancement in the literature .... The results suggest that organizational fairness is best conceptualized as ... distinct dimensions ... Many have debated whether interactional justice should be considered a subset of procedural fairness ... the results suggests that collapsing procedural fairness and interactional fairness together would mask important differences ... *interactional fairness should be broken down into its interpersonal and informational justice component as they too had differential effects*" (Emphasis added).

With respect to financial measures, it appears that the relationship between this type of performance measures and job-relevant information may not be significant. We evaluate this finding with those found in prior studies, particularly with those from the different streams of research in the budgeting literature. The first stream includes Hopwood (1972) and Otley (1978) which are the two of the earliest systematic studies in the budgeting area. Both studies found that the use of financial measures for employee performance evaluation in a *rigid* manner is associated with more *dysfunctional* consequences (including high job-related tension and manipulation of the budget) than when financial measures are used in a *flexible* manner. These findings on the *dysfunctional consequences* of how financial measures are used do not contradict the finding of our study that the use of financial measures is not significantly related to the extent of job-relevant information. Subsequent studies in budgeting, which attempted to reconcile the findings of Hopwood (1972), and (Otley, 1978) constitute another important stream of research. These studies generally introduced contingent

variables, the most important of which is the extent by which employees participate in the target-setting process (budgetary participation). In general, the results of studies which incorporated budgetary participation in their model (e.g., Brownell, 1982; Brownell & Dunk, 1991; Brownell & Hirst, 1986; Harrison, 1992; Lau, Low, & Eggleton, 1995) indicate that *budgetary participation* may have significant effects on several employees' outcomes. It is, however, important to note that the focus of these studies is on the *effects* of *budgetary participation*, and not on the *effects* of *performance measures* per se. Our study examines the effects of performance measures per se, that is, whether the measures are financial or a combination of financial and nonfinancial. The effects of budgetary participation are not examined in our study. Moreover, the dependent variables of prior research on budgeting are generally job-related tension, job satisfaction or job performance and not job-relevant information, the variable in our model. A notable exception is Kren (1992, pp. 513–514) who also examines *job-relevant information*. However, similar to those studies which incorporate budgetary participation in their models, Kren's (1992) emphasis is also on the effects of *budgetary participation*. Specifically, his hypothesis states that "*participation* increases job-relevant information"; and he argues as follows: "*Budgetary participation* can ... facilitate the acquisition and use of JRI ... *Participation* may ... increase the manager's attempts to formulate accurate forecast ..." (emphasis added). In other words, while our study focuses on the effects of performance measures per se, that is, *whether the measures are financial or nonfinancial*, prior research on budgeting including Kren (1992) has generally focused on *budgetary participation*, that is, whether budgeting is *participatory* or *imposed* by top management. Consequently, the results of our study are not contrary to those found in the budgeting literature.

There are limitations associated with the study. While utmost care was taken for a representative sample, bias, and other limitations associated with the survey method may still be present. Moreover, as the sample was derived from relatively large manufacturing organizations, the results may not be generalizable to smaller size organizations and nonmanufacturing sectors. The scope of our study is also limited to two employee outcomes. It is likely that comprehensive PMS and financial measures may also affect other employee outcomes. It may also be beneficial for future research to consider other mediating variables (e.g., participation, role clarity, leadership support) and other desirable employee outcomes from employees' perspective (e.g., interpersonal trust, job satisfaction, involvement, and performance). Our study investigates the effects of performance measurement

systems on employees' reactions. The focus is on the role of performance measurement system in the communication of job-relevant information to employees by the organization. Consequently, informational fairness is selected as the appropriate dependent variable for investigation. However, informational fairness is one of the several dimensions of organizational fairness. Beside informational fairness, the organizational fairness literature suggests that there are other dimensions of fairness including distributive fairness, structural procedural fairness, and interpersonal fairness. As these other fairness dimension are not included in our model but are also important, opportunities exist for future research to also investigate how performance measurement systems influence these other fairness constructs. Nevertheless, despite the aforementioned limitations, our study contributes by informing the current debate on the roles and importance of performance measurement systems with new evidence based on highly relevant but previously unexplored variables and relationships.

## REFERENCES

- Adams, J. S. (1965). Inequity in social exchange. In L. Berkowitz (Ed.), *Advances in experimental social psychology* (Vol. 2, pp. 267–299). New York, NY: Academic Press.
- Baines, A., & Langfield-Smith, K. (2003). Antecedents to management accounting change: A structural equation approach. *Accounting, Organizations and Society*, 28, 675–698.
- Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51(6), 1173–1182.
- Bartol, K. (1983). Turnover among DP personnel: A causal analysis. *Communications of the ACM*, 26, 807–811.
- Bies, R. J., & Moag, J. F. (1986). Interactional justice: Communication criteria of fairness. In R. J. Lewicki, B. H. Sheppard, & M. H. Bazerman (Eds.), *Research in negotiations in organizations* (Vol. 1, pp. 43–55). Greenwich, CT: JAI Press.
- Bol, J. C. (2008). Subjectivity in compensation contracting. *Journal of Accounting Literature*, 27, 1–24.
- Brownell, P. (1982). The role of accounting data in performance evaluation, budgetary participation, and organizational effectiveness. *Journal of Accounting Research*, 20(1), 12–27.
- Brownell, P., & Dunk, A. (1991). Task uncertainty and its interaction with budgetary participation and budget emphasis: Some methodological issues and empirical investigation. *Accounting, Organization and Society*, 16(8), 693–703.
- Brownell, P., & Hirst, M. (1986). Reliance on accounting information, budgetary participation, and task uncertainty: Tests of a three-way interaction. *Journal of Accounting Research*, 24(2), 241–249.
- Burney, L. L., Henle, C. A., & Widener, S. K. (2009). A path model examining the relations among strategic performance measurement system characteristics, organisational justice

- and extra- and in-role performance. *Accounting, Organisations and Society*, 34(3–4), 305–321.
- Burney, L. L., & Widener, S. K. (2007). Strategic performance measurement systems, job relevant information and managerial behavioral responses – Role stress and performance. *Behavioral Research in Accounting*, 19, 43–69.
- Chenhall, R. H. (2005). Integrative strategic performance measurement systems, strategic alignment of manufacturing, learning and strategic outcomes: An exploratory study. *Accounting, Organizations and Society*, 30, 395–422.
- Chin, W. W. (1998). Issues and opinion on structural equation modelling. *MIS Quarterly*, 22(1), vii–xvi.
- Cohen, J. (1988). *Statistical power analysis for the behavioural sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum.
- Colquitt, J. A. (2001). On the dimensionality of organizational justice: A construct validation of a measure. *Journal of Applied Psychology*, 86(3), 386–400.
- Colquitt, J. A., Conlon, D. E., Ng, K. Y., Porter, C. O., & Wesson, M. J. (2001). Justice at the millennium: A meta-analytical review of 25 years of organizational justice research. *Journal of Applied Psychology*, 86(3), 425–445.
- Conlon, E., & Parks, J. (1988). The effects of monitoring and tradition on compensation arrangements: An experiment on principal/agent dyads. In F. Hoy (Ed.), *Best papers proceeding* (pp. 191–195). Anaheim, CA: Academy of Management.
- Eccles, R. (1985). Transfer pricing as a problem of agency. In J. Pratt & R. Zeckhauser (Eds.), *Principals and agents: The structure of business* (pp. 151–186). Boston: Harvard Business School Press.
- Efron, B., & Tibshirani, R. (1993). *An introduction to the bootstrap*. New York, NY: Chapman Hall.
- Eisenhardt, K. M. (1989). Agency theory: An assessment and review. *Academy of Management Review*, 14, 57–74.
- Emsley, D. (2005). Restructuring the management accounting function: A note on the effect of role involvement on innovativeness. *Management Accounting Research*, 16(2), 157–177.
- Fisher, J. (1992). Use of nonfinancial performance measures. *Journal of Cost Management*, (Spring), 31–38.
- Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18, 39–50.
- Greenberg, J. (1993). The social side of fairness: Interpersonal and informational classes of organizational justice. In R. Cropanzano (Ed.), *Justice in the workplace: Approaching fairness in human resource management* (pp. 79–103). Hillsdale, NJ: Erlbaum.
- Greenberg, J., & Colquitt, J. A. (2005). *Handbook of organizational justice*. New York, NY: Lawrence Erlbaum Associates.
- Hall, M. (2008). The effect of comprehensive performance measurement systems on role clarity, psychological empowerment and managerial performance. *Accounting, Organizations and Society*, 33, 141–163.
- Harrison, G. L. (1992). The cross cultural generalizability of the relation between participation, budget emphasis and job-related attitudes. *Accounting, Organizations and Society*, 17(1), 1–15.
- Hartmann, F., & Slapničar, S. (2009). How formal performance evaluation affects trust between superior and subordinate managers. *Accounting, Organizations and Society*, 34, 722–737.

- Hopwood, A. G. (1972). An empirical study of the role of accounting data in performance evaluation. Empirical research in accounting: Selected studies. *Journal of Accounting Research*, 10, 156–182.
- Hoque, Z., Mia, L., & Alam, M. (2001). Market competition, computer-aided manufacturing, and use of multiple performance measures: An empirical study. *The British Accounting Review*, 33, 23–45.
- Ittner, C. D., Larcker, D. F., & Randall, T. (2003). Performance implications of strategic performance measurement in financial services firms. *Accounting, Organizations and Society*, 28, 715–741.
- Johnson, T. H., & Kaplan, R. S. (1991). *Relevance lost: The rise and fall of management accounting*. Boston, MA: Harvard Business School Press.
- Kaplan, R. S. (1984). The evolution of management accounting. *The Accounting Review*, 59(3), 319–418.
- Kaplan, R. S., & Norton, D. (1992). The balanced scorecard – Measures that drive performance. *Harvard Business Review*, January/February, 71–79.
- Kaplan, R. S., & Norton, D. (1996). *The balanced scorecard: Translated strategy into action*. Boston, MA: Harvard Business School Press.
- Kren, L. (1992). Budgetary participation and managerial performance: The impact of information and environment volatility. *The Accounting Review*, 67(3), 511–526.
- Lau, C. M., & Lim, E. W. (2002). The effects of procedural justice and evaluative styles on the relationship between budgetary participation and performance. *Advances in Accounting*, 19, 139–160.
- Lau, C. M., Low, L. C., & Eggleton, I. R. (1995). The impact of reliance on accounting performance measures on job-related tension and managerial performance: Additional evidence. *Accounting, Organizations and Society*, 20(5), 359–381.
- Lau, C. M., & Moser, A. (2008). Behavioral effects of nonfinancial performance measures: The role of procedural fairness. *Behavioral Research in Accounting*, 20(2), 55–71.
- Leach-Lopez, M. A., Stammerjohan, W., & McNair, F. M. (2007). Differences in the role of job relevant information in the budget participation-performance relationship among US and Mexican managers: A question of culture or communication? *Journal of Management Accounting Research*, 19, 105–136.
- Leventhal, G. S. (1980). What should be done with equity theory? New approaches to the study of fairness in social relationships. In K. Gergen, M. Greenberg, & R. Willis (Eds.), *Social exchanges: Advances in theory and research* (pp. 27–55). New York, NY: Plenum Press.
- Libby, T. (1999). The influence of voice and explanation on performance in a participative budgeting setting. *Accounting, Organizations and Society*, 24, 125–137.
- Libby, T. (2001). Referent cognitions and budgetary fairness: A research note. *Journal of Management Accounting Research*, 13, 91–105.
- Lind, E., & Tyler, T. (1988). *The social psychology of procedural justice*. New York, NY: Plenum Press.
- Lindquist, T. M. (1995). Fairness as an antecedent to participative budgeting: Examining the effects of distributive justice, procedural justice and referent cognitions on satisfaction and performance. *Journal of Management Accounting Research*, 7, 122–147.
- Magner, N., & Welker, R. B. (1994). Responsibility center manager's reactions to justice in budgetary resource allocation. *Advances in Management Accounting*, 3, 237–253.

- Mia, L., & Chenhall, R. H. (1994). The usefulness of management accounting system, functional differentiation and managerial effectiveness. *Accounting, Organizations and Society*, 19(1), 1–13.
- Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory*. New York, NY: McGraw-Hill.
- Oppenheim, A. N. (2001). *Questionnaire design, interviewing and attitude measurement*. London: Pinter Publishers.
- Otley, D. T. (1978). Budget use and managerial performance. *Journal of Accounting Research*, 16(1), 122–149.
- Pedhazur, E. J. (1982). *Multiple regression in behavioral research*. New York, NY: Holt, Rinhart & Winston.
- Ringle, C. M., & Hansmann, K. W. (2004). *SmartPLS manual*. Hamburg: University of Hamburg.
- Shapiro, D. L., Buttner, E. H., & Barry, B. (1994). Explanations: What factors enhance their perceived adequacy? *Organizational Behavior and Human Decision Processes*, 58, 346–368.
- Thibaut, J., & Walker, R. (1975). *Procedural justice: A psychological analysis*. Hillside, NJ: Lawrence Erlbaum Associates.
- Urbach, N., & Ahlemann, F. (2010). Structural equation modeling in information systems research using partial least squares. *Journal of IT Theory & Application*, 11(2), 5–40.
- Vaivio, J. (1999). Exploring a nonfinancial management accounting change. *Management Accounting Research*, 10, 409–437.
- Vandenbosch, B. (1996). Information acquisition and mental models: An investigation into the relationship between behaviour and learning. *Information Systems Research*, 7(2), 198–214.
- Wentzel, K. (2002). The influence of fairness perceptions and goal commitment on managers' performance in a budget setting. *Behavioral Research in Accounting*, 14, 247–271.
- Wold, H. (1985). Systems analysis by partial least squares. In P. Nijkamp, H. Leitner, & N. Wrigley (Eds.), *Measuring the unmeasurables*. Dordrecht, The Netherlands: Martinus Nijhoff.



## APPENDIX: QUESTIONNAIRE ITEMS

### *Comprehensive performance measurement systems*

Performance measurement systems typically comprise methods of setting business goals together with periodic feedback reports that indicate progress against those goals. They focus on data – financial and nonfinancial information that influences decision making and managers' action. Please indicate your degree of agreement or disagreement with the following statements.

(1 = strongly disagree, 7 = strongly agree)

The performance measurement system provides a broad range of performance information about different areas of my unit.

The performance measurement system is produced in a fully documented form, which provides a record for evaluating performance.

It provides a diverse set of measures related to the key performance areas of my unit.

It provides consistent and mutually reinforcing links between the current operating performance of my unit and the long-term strategies of the organization.

The performance measurement system provides information on different dimensions of my unit's performance.

It links together the activities of my unit to the goals and objectives of the organization.

It provides a variety of information about important aspects of my unit's operations.

It shows how the activities of my unit affect the activities of other units within the organization.

The performance measurement system provides a range of measures that cover the critical areas of my unit's operation.

### *Financial performance measures*

When your superior (your immediate boss) is evaluating your performance, how much importance do you think he or she attaches to the following items?

(1 = never important, 7 = always important)

My ability to meet my budget.

My ability to avoid unfavorable budget variances.

My ability to meet or better budgeted costs or sales.

My ability to achieve budgeted cost reductions or budgeted sales growth.

My ability to achieve financial targets.



*Job-relevant information*

Please indicate your degree of agreement or disagreement with the following statements.

(1 = strongly disagree, 7 = strongly agree)

I am always clear about what is necessary to perform well on my job.

I have adequate information to make optimal decisions to accomplish my performance objectives.

I am able to obtain the strategic information necessary to evaluate important decisions.

*Informational fairness*

The following items refer to your superior who enacted performance evaluation procedures. To what extent ...

(1 = to a very little extent, 5 = to a very great extent).

Has he/she been candid in his/her communication with you?

Has he/she explained the procedures thoroughly?

Has he/she communicated details in a timely manner?

Has he/she seemed to tailor his/her communication to individuals' specific needs?