Factors Influencing the Use of Performance Information for Decision Making in Australian State Agencies

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Abstract

Is the state of a performance measurement system the most important element for promoting the utilization of performance indicators (PIs) in the public sector? Or are there other more influential factors, such as organizational culture, or even employees' perceptions on the merit of performance measurement for their agency? Through a survey on a small group of managers in 21 Australian state government agencies, this research examines the relative influence of the following factors on the use of PIs for internal decision making: the agency's performance measurement system, stakeholder support for the agency's performance measurement, organizational culture, the external environment, and individual perceptions on the impact of performance measurement in the agency.

Keywords

Performance measurement, performance indicators, performance information use, decision making, organizational culture.

INTRODUCTION

Early efforts to measure performance have largely relied on two assumptions. First, that activities to measure performance, notably through performance indicators (PIs) will invariably be accompanied by activities to use the information for decision making. Second, that the use of performance information for decision making can be chiefly facilitated by structural and technical advancements in performance measurement. The latter is evident by the majority of discussions and initiatives on performance measurement aimed at developing sophisticated performance measurement frameworks and methodologies, standards and indicators (Martin and Smith 2005; Rubenstein *et al.* 2003). These assumptions have in turn helped to establish the appealing link between the objective image of performance measurement and rational decision making, and promote the notion that the use of objective PIs for decision making can contribute to the objectivity of the process. The argument that the harder the data, the more likely that they would be used by rational bureaucrats clearly sends a message that public sector decision making is becoming less ambiguous and subjective and more accountable and objective.

But how well do these two assumptions stand up to empirical testing? To what extent is PIs generally used for internal decision making? And do technical matters frequently dominate over other influences in driving performance information utilization? Whilst several authors have recently alluded to the importance of attending to factors other than technical matters when promoting the use of performance information for internal decision making, they did not explicitly state that these factors are more important than technical factors (De Lancer Julnes and Holzer 2001; Moynihan 2006; Vakkuri and Meklin 2006).

The aim of this article is two-fold. The first is to examine the frequency of utilization of PIs for internal decision making in public agencies. The second and more important objective is to undertake a systematic investigation into the relative significance of specific factors that have been associated with the use of performance information for decision making. They consist of (1) individual influences, in the form of individual perceptions on the impact of performance measurement in the agency; (2) structural and technical influences, in the form of the agency's performance measurement system; (3) cultural influences, in the form of organizational culture and stakeholder support for the agency's performance measurement; and (4) external influences, in the form of the external political environment. This article will examine which of these internal and external factors are significantly associated with the use of PIs for decision making amongst Australian state government agencies.

The eight states and territories in Australia have each established their own performance measurement and reporting framework that focuses on outputs and/or outcomes. Along with this enthusiasm to measure performance, several have embraced related buzzwords, such as the triple bottom line, balanced scorecard and benchmarking. Importantly, the governments have encouraged their agencies to use PIs for internal decision making: 'Sound financial and performance information is essential to establish priorities and inform decisions on whether: policies and processes work; to expand, contract, relocate or cease a service; the most efficient and effective delivery model is being used' (Audit Office of New South Wales 2006, p.14). However, some Australian state government bodies, such as the Office of Auditor General for Western Australia (2006, 2008) have noted that not all state agencies are using PIs as part of their decision making process. This research thus has the potential to shed some light on the

major factors that are related to performance information use in Australian state agencies, and in this way contribute to the international literature on performance measurement.

THE THEORETIC AL BASES OF PERFORMANCE INFORMATION USE

A major appeal of performance measurement lies in the assumption that information forms the basis of improved decisions. Performance information is largely assumed to provide opportunities for decision makers to learn about the activity or area that is being measured, which will consequently lead to better decisions. Moynihan (2005) noted that this assumption of performance information contributing to learning in organizations fits well with the organizational learning theory.

Based on the organizational learning literature, one way that organizations can learn is through proper structures. The structural approach to organizational learning, or what Lipshitz *et al.* (1996) call organizational learning mechanism, emphasizes formal rules and procedures to facilitate learning. Many Australian state government agencies' performance measurement initiatives appear to follow this approach in that the structure is typically derived from legislative and administrative mandates on performance measurement and reporting, and the subsequent development of formal rules and procedures to measure, collect, and report on agencies' performance. Agencies usually draw up strategic or business plans to specify goals and measure performance through PIs. They will report on their performance in a process that resembles, and is often an element of, the annual budget reporting process. Performance information is typically found in agency and/or government-wide documents. In short, routines of performance

information collection and dissemination are assumed to be accompanied by routines of performance information use (Moynihan 2005).

The organizational learning literature also alludes to the importance of organizational culture for learning (Schein 1992). The cultural approach to learning relies on shared and functional experiences and norms amongst employees to bring about new learning (Senge 1990). A workplace with a learning culture is one that provides numerous opportunities for employee autonomy, participation and empowerment (Argyris and Schon 1996; Fiol and Lyles 1985).

Recently, researchers such as Moynihan (2005) point to the interaction between structure and culture in shaping organizational learning. If routines are critical for shaping employees' behaviour (Leavitt and March 1990), then whether and how employees decide to establish and participate in routines will rest on what they consider to be appropriate for their organization (Moynihan 2005). This implies that even if learning routines are developed in an organization, the way that employees value, evaluate, and interpret the information can be influenced by cultural biases (Mahler 1997). This implies that employees' ability to learn from performance information can be dependent on two conditions: (1) that they have access to the necessary information; and (2) that routines of data consideration are regarded as appropriate behaviour within their organization (Moynihan 2005). Employees will learn if they have the information to learn, and their organizational culture accepts routines of performance information consideration as appropriate organizational behaviour.

Although performance information can be used in an agency for learning or improvement purposes, it can also be used to generate a different outcome, notably strategic organizational outcomes. The bureaucratic political model portrays choices as being dictated by the parochial interests of actors (Allison 1969; Fischer 1986; Henri 2006). Here, PIs can be selectively presented by agencies to support their interests. Using dialogue theory, Moynihan (2006) explains that PIs can be used to serve political ends due to the ambiguity inherent in interpreting performance information and the influence of roles in the political process. Rather than a lack of information, this ambiguity is argued to be caused by different perspectives of individuals. In other words, the subjective meanings assigned to performance data permit variation in and rival interpretations of performance information to occur that are consistent with the actors' views and interests. The fact that different motives can drive performance information use in government agencies implies that performance information use for decision making can be associated with different factors, as detailed in the hypotheses.

HYPOTHESES

Performance Measurement System

Based on the structural approach to organizational learning theory, routines of performance measurement will invariably be followed by routines of performance information use for decision making. The importance placed on good routines extends to the quality of the performance measurement system. After all, the information derived from the system has to be relevant and useful to the officials to be used. This explains the bulk of research on performance

measurement being devoted to improve the performance measurement system (Kravchuk and Schack 1996; Rubenstein *et al.* 2003; Taylor 2006). If an agency establishes a close link between its goals and PIs, sets high but realistic performance targets, and undertakes regular performance audits on its PIs, then it is likely to yield a significant impact on the agency's decision making process. It is possible that the higher the quality of a PI system, the more likely the information derived from this system will be used to make decisions. It is also possible that the more performance information is used for decision making, the more likely that the PI system will improve, through feedback obtained on what had worked and what had not, as seen in the evolvement of the PI system in the public sector over time. It can be hypothesized that

H_1: The quality of an agency's performance measurement system is significantly related to its officials' use of performance information for decision making.

Organizational Culture

The cultural approach to organizational learning suggests the importance of taking organizational culture into account when considering the use of performance information for decision making (Moynihan 2005). Organizational culture determines not just the agency's strategy and goals, but also its modes of operation (Kim *et al.* 2006), including that of performance measurement (Henri 2006). Different organizational contexts can have different rules and norms about using performance information (Vakkuri and Meklin 2006). According to Ho (2006), PIs should accompany changes in organizational culture in order to for them to have a significant impact on decision making. An organizational culture that accepts routines of performance measurement

and reporting as appropriate organizational behaviour is likely to use performance information for decision making more than one that is sceptical of or opposed to the implementation of such a system in the organization.

Organizational culture can in turn be categorized into four types (Moynihan and Pandey 2005; Quinn and Kimberly 1984; Zammuto and Krakower 1991). Developmental cultures are preoccupied with the organization, flexibility, growth and resource acquisition. Group cultures focus on people in the organization, employee cohesion and morale. Hierarchical cultures emphasize uniformity, coordination, evaluation, and ensuring internal efficiency and organizational stability. Rational cultures focus on productivity, performance, goal fulfilment and achievement. These categories are not mutually exclusive; agencies are likely to display the different types of organizational culture to different extent (Zammuto and Krakower 1991).

Just as it is likely that certain organizational cultures can be more receptive to the use of PIs for decision making than other cultures, it is equally plausible that the incorporation of PIs into an agency's decision making process may make some organizational cultures more prominent, such as rational organizational cultures. Despite the lack of empirical evidence on the relationship between organizational culture and decision making, the fact that performance measurement has been more often associated with improving productivity (rational organizational culture) and efficiency (hierarchical organizational culture) than employee cohesion (group culture) and growth (developmental culture), leads to the expectation that

H_2: Rational and hierarchical organizational cultures in an agency are significantly related to its officials' use of performance information for decision making more than group and developmental organizational cultures.

Stakeholder Support

The influence of organizational culture on performance information use may include stakeholder support for performance measurement. Officials may take cues about what constitutes appropriate organizational norms on performance measurement by observing the level of support that key stakeholders endow to their agency's PI system. Stakeholder support helps agencies to obtain resources, autonomy, authority, leadership stability and administrative continuity for the application of the system (Meier 2000; O'Toole and Meier 2003).

Stakeholder support for performance measurement includes support by both politicians and organizational members. Various scholars have highlighted the importance of political support for performance measurement (De Lancer Julnes and Holzer 2001; Moynihan 2006; Wang and Berman 2001). Ho (2006, p. 219) stated that, 'If elected executives and legislators are not interested in performance measurement, managers may easily lose their enthusiasm about the tool because they do not see any payoff from their time investment and effort to collect and report the data'. Political support thus has a flow-on effect on organizational support. With strong political support, managers are likely to become more confident about obtaining the resources and the flexibility to adopt and implement performance measurement in their agencies. Yang and Hsieh (2007) argued that it is organizational support that matters more:

'Entrepreneurial public managers may energize the organization to pursue performance measurement even when general political support is not high' (p. 872). Conversely, organizational employees who are not ready for performance measurement may perceive it as a control gimmick by politicians and a threat to bureaucratic power. Just as it is possible for officials to use performance information more for decision making when they are convinced that stakeholders support their PI system, it is also possible for stakeholders to support the PI system when they observe officials' frequent use of the information for making decisions. The literature suggests that stakeholder support plays an important role in integrating performance measurement with decision making (Bouckaert 1993). Therefore,

H_3: Stakeholder support for an agency's performance measurement system is significantly related to its officials' use of performance information for decision making.

External Environment

Rather than being used for learning or improvement purposes, performance information can be applied for political purposes, as alluded to by the political framework. Public agencies are subject to greater political and public scrutiny than private firms (Noordegraaf 2006). They are likely to rely more on the support of external stakeholders than their actual performance for their legitimacy. They are aware that any PIs released to external stakeholders, like members of the public, can shape these stakeholders' perceptions on the worth of the agencies' mission, the degree of autonomy they enjoy, the level of public and political support, and even the supply of resources received (Meier 2000). The fact that media coverage is perceived to shape public

opinion suggests that agencies would, as far as possible, endeavour to avoid negative publicity. Most public sector decisions are accordingly political decisions (Bozeman and Pandey 2004).

Although not all studies support the close association between performance measurement and its political context (e.g., Boyne *et al.* 2004), several agree that the agencies' concerns about the political consequences of performance measurement can shape their view and incorporation of PIs in the decision-making process (Ammons 2001; Ho 2003). The fourth hypothesis is thus

H_4: An agency's external environment is significantly related to its officials' use of performance information for decision making.

Individual perceptions on the impact of performance measurement

In addition to external and internal organizational influences, it is important to take into account the officials' perceptions on the effects of their agency's PI system. Although the literature on performance measurement contains abundant information about its benefits, such as improved accountability and efficiency, it also details its shortcomings. PIs have often been criticized for being incapable of capturing a representative and comprehensive picture of the performance of a unit or individual because of their inability to measure quality well, and to differentiate the results from external influences, to name a few (Kravchuk and Schack 1996; Taylor 2001). Whilst many public officials may agree in principle that performance measurement is a good thing for the public sector, they may be less receptive to its application in their agency. Since government agencies must conduct their business in full view of external stakeholders, from

politicians to critics and watchdogs, the officials in these agencies are likely to be concerned that they are being held accountable for results they believe they cannot control.

The relationship between attitudes and actions may apply for either direction. The first occurs when officials' views on the impact of PIs shape their use of performance information for decision making (attitudes -> actions). If they believe that performance measurement has been useful to their agency, then they are likely to use performance information for decision making. In their survey of 15 government municipalities in the US, Ammons and Rivenbark (2008) observe that the officials would use performance information for internal operations if they embrace performance comparison or benchmarking with other governments or service providers. The second occurs when officials who use PIs for decision making progressively become aware of the benefits over time, which in turn affect their attitudes (actions -> attitudes). The fifth hypothesis is thus

H_5: The officials' perceptions on the impact of performance measurement in their agency are significantly related to their use of performance information for decision making.

The literature review suggests that numerous factors, such as how the performance measurement system is implemented by agencies, whether there is sufficient support from the leadership, and whether there has been a successful cultural change to support performance measurement, can influence the results (Grizzle and Pettijohn 2002; Willoughby and Melkers 2000). But due to lack of empirical evidence, it would be difficult to propose which of the above five factors play a greater role in driving performance information use for decision making. The

bulk of discussions and initiatives on performance measurement devoted to formulating sophisticated performance measurement methodologies and techniques, standards and indicators would suggest that technical advancements matter more. However, statements by researchers, such as Sanger (2008) who maintains that 'even mature and well-designed systems implemented in progressive and culturally hospitable environments can be ignored, if not subverted, by anxious bureaucrats' (p.S77) would suggest that the concerns and attitudes of the users towards the effects of performance measurement could override technical factors and a conducive environment. Given the lack of empirical evidence in this area, a general hypothesis on the relationship between individual, technical, cultural and external factors and the use of performance information for decision making is put forward.

H_6: Individual, technical, cultural and external factors have an equal chance of being significantly related to the use of performance information for decision making.

METHODOLOGY

Sample

Forty government state agencies, mainly government departments, in different areas (primary industry, infrastructure, law and order, health and environment, and social services), were randomly selected for this study. The heads of agencies were sent an information letter about a questionnaire to be distributed to all employees in the agencies. The employee level survey is aimed at collecting the officials' perspectives on the influences of PIs in decision making at all levels in an agency. Although the use of perceptual measures is subject to limitations, notably

errors from social desirability bias, it is important to note that 'individual perceptions mediate the relationships between objective characteristics of the work environment and individual responses' (Yang and Pandey 2008, p.339).

Twenty one agencies agreed to participate in the survey, but most chose to identify the sample group within their agencies. According to them, limiting the survey to employees who deal with PIs as part of their job description would minimize the exposure of their employees to survey overload, and ensure the relevance of the survey to the staff members concerned. The number of employees with such a job description is small; responses ranged from one to three per agency. There were also some agencies which circulated the survey to all or most employees, providing responses from different units within the agency. The final number of respondents was 53. The participants completed the questionnaire and returned it directly to the researcher. Most of the participants were male (58%), aged 45-54 years (33%), in permanent employment (90%), and occupied middle management (69%). On average, most of them worked in their immediate unit consisting of some 37 employees, in a medium to large sized agency, for eight years.

Clearly, it would be preferable to have a large enough number of participants from every agency to guarantee representativeness and reliability. This study, however, largely followed a mode where a single 'expert' or group of 'expert' participants provides data for an entire agency. Elite surveys of this kind, which usually target organizational members at a more senior level with a long history with or extensive knowledge of the organization, are common in public management research (Brudney *et al*. 1999; Meier and O'Toole 2001). It is argued that this individual has 'the best vantage point for viewing the entire organizational system' (Snow and

Hrebiniak 1980, p.320). This view, however, is not universally shared (e.g., Enticott *et al.* 2008). For instance, Phillips (1981) argued that the correlation between length of organizational service and knowledge is tenuous. Of particular concern is the participants' close proximity to performance measurement, which may cloud their views on PIs. Individuals who are employed primarily to handle PIs would probably view them in a more positive light and perhaps even use them more often than others with a different job description. The possibility that the findings may be more positive than otherwise could be is noted as a limitation of this study. Nevertheless, the fact that participation was largely confined to employees who prepared, implemented and/or managed PIs as part of their job, could be regarded as useful because it provides an insight into the attitudes and actions of this group of employees.

Measurement

All variables are measured by index scores based on multiple survey items. They are listed as follows:

1. Decision making. This five-itemed dependent variable assesses the extent to which PIs are used for decision making. The various uses of decision making are also measured, from their use to prompt questions, to their use to support and correct decisions. The items are adapted from Taylor (2007), and Henri (2006). Cronbach's alpha, $\alpha = .824$.
2. PI system. This variable evaluates the extent to which the agency's PI system satisfies the basic characteristics associated with a good performance measurement system, such as its close link to an identifiable goal. It contains eight items, adapted from Poister and Streib (1999), and Taylor (2006). $\alpha = .903$.

3. Organizational culture. Drawn from Zammuto and Krakower (1991), four categories of organizational culture – rational, hierarchical, group and developmental – are measured.
4. Stakeholder support. This is measured with a four-item index, adapted from Taylor (2006), and Yang and Hsieh (2007). It assesses the following stakeholders' support of the agency's performance measurement – politicians, departmental heads, managers, and employees. $\alpha = .815$.
5. External environment. Five items, adapted from Ho (2006), and Moynihan and Pandey (2005), measure the extent to which the agency is influenced by media and public opinion, and is concerned that the media and public can use PIs against it. $\alpha = .818$.
6. Attitudes on the impact of PIs. This evaluates the participants' perceptions on the effects of the implementation of performance measurement in their agencies. It is measured with a four-item index, adapted from Taylor (1999). $\alpha = .738$.

Details of the relevant items and coding scales can be found in the appendix. The responses are measured with a seven-point Likert scale, in terms of frequency of use (where 1 = none whatsoever, 2 = close to negligible, 3 = less than sometimes, 4 = sometimes, 5 = more than sometimes, 6 = frequently, 7 = all the time), or degree of agreement (1 = strongly disagree, 2 = disagree, 3 = somewhat disagree, 4 = neutral, 5 = somewhat agree, 6 = agree, 7 = strongly agree). The personal characteristics are gender (1 = F; 0 = M); age (1 = below 25 years (yrs); 2 = 25-34 yrs; 3 = 35-44 yrs; 4 = 45-54 yrs; 5 = 55-64 yrs; 6 = above 65 yrs); job position (1 = middle manager; 0 = senior executive); employment (1 = permanent; 0 = contract); length of service in the agency (in years); size of the agency (1 = small; 2 = medium; 3 = large); and number of employees in the immediate unit within the agency.

The data are also differentiated by state (1 = first state; 2 = second state). Although the performance measurement and reporting practices are generally similar in that the agencies in these two states are required under legislation to regularly report on their output/outcome performance achievements to external accountability authorities, such as the Office of the Auditor-General, and are subjected to performance audits under legislation, there are some differences. For one, the occasional reports released by the government auditor in the first state present comprehensive results of the performance management systems audits on identified government departments, which is not available in the second state. This intense external scrutiny may provide an impetus for them to utilize and improve on their system. The government auditor in the second state has reported recently that too many agencies in the state continue to provide PIs and supporting documents for audit that are of poor quality. There is thus a possibility that agencies from the two states may differ in their use of PIs.

Data analysis

The data are analysed by agency. The fact that some participants are drawn from the same agency violates the assumption of independent observations. Accordingly, the models will be analysed at the agency level.

FINDINGS

Correlation matrix

Descriptive statistics and bivariate correlations of the study variables are presented in Table 1. On average, the participants 'sometimes' used PIs for decision making in their agencies, and were 'sometimes' concerned that the public and media may use the PIs against their agencies. They somewhat agreed that they had received stakeholder support for performance measurement in their agency. They also somewhat agreed that their agencies had a rational organizational culture, and to a lesser extent a hierarchical culture. They 'more than sometimes' perceived that their agencies' PI system contained desirable characteristics, such as in terms of ease of access. They, however, adopted a neutral stance on the variable measuring their attitudes on the impact of performance measurement in their agency. On average, they neither agreed nor disagreed that performance measurement has been beneficial for their agency. They did not register strong enthusiasm for performance measurement; nor did they show strong opposition to and concerns about performance measurement in their agency.

<Table 1 about here>

The bivariate correlation results show that the main relationships between a few study variables are in the anticipated directions. Decision making was found to be significantly associated with a few independent variables. The first and strongest is with attitudes on the impact of performance measurement. The high correlation value suggests that PIs were used most when they were judged to work best, and vice versa. The second is with the PI system, and

the third is with hierarchical organizational cultures. Other types of organizational culture were not found to be significantly related to decision making. The agencies that were more likely to incorporate PIs into their decision making process had a good PI system, and a predominant hierarchical organizational culture. The two other independent variables – external environment and stakeholder support – were not found to be significantly associated with decision making. The participants' level of use of PIs for decision making did not appear to be considerably shaped by their perceptions that the public and media could use the information against their agency, and the levels of support for their agency's performance measurement by politicians, and colleagues and leaders of their agency.

When it came to control variables, two were found to be significantly related to decision making: position and state. The participants at middle management positions were more likely to utilize PIs for making decisions than their senior counterparts. In addition, the participants from the first state were found to use PIs more for decision making than those in the second state.

Regression analysis

To examine the association between decision making and the independent factors more closely, seven regression analyses were conducted. The first analysis (base model) regresses decision making on the control variables. This regression examines how much variance in the independent variables is accounted for by the control variables. Two controls were found to have a significant influence: position and state. The participants at middle management level, and in

the first state were more likely to use PIs for decision making than those at a more senior level, and in another state respectively. The results are shown in Table 2.

<Table 2 about here>

The remaining analyses focus on testing the hypotheses. The decision making variable is regressed on the control variables and each of the independent variables to produce different models. The first model assesses the influence of the PI system. The second model evaluates the four categories of organizational culture, the third model tests stakeholder support, the fourth looks at external environment, and the fifth examines attitudes on the impact of PIs. The significant beta coefficient value found in the PI system variable under the first model supports the first hypothesis that the quality of an agency's performance measurement system is significantly related to its officials' use of performance information for decision making.

On the other hand, the results in the second to fourth models downplay the significance of the independent factors in these models. None of the four organizational cultures in the second model were found to play a significant role. The second hypothesis that rational and hierarchical organizational cultures in an agency are significantly related to its officials' use of performance information for decision making more than group and developmental organizational cultures is thus rejected. Similarly, the results in the next two (third and fourth) hypotheses on the significant relationship between the use of PIs for decision making, and (1) stakeholder support, and (2) external environment, are rejected, as shown by the insignificant beta coefficient values in the models (third and fourth respectively).

In contrast, the fifth model shows a significant beta coefficient value in the variable measuring the officials' perceptions on the impact of performance measurement in their agency. The results confirm the fifth hypothesis that the officials' perceptions on the impact of performance measurement in their agency are significantly related to their use of performance information for decision making.

The final analysis and model combines all independent variables together to test the sixth hypothesis on whether individual, structural and technical, cultural and external factors have an equal chance of being significantly related to the use of performance information for decision making. This combined model explains 92 percent of the variance in performance information use for decision making. Only one independent variable produced significant results under the combined model – attitudes on the impact of PIs. The participants who perceived that the application of performance measurement had been generally beneficial to their agency had been associated with significantly higher use of PIs for decision making. The other independent variables – PI system, organizational culture, stakeholder support, and external environment – were not found to play a significant role in the combined model. The sixth hypothesis about the equal influence of all independent variables is thus rejected. The findings suggest that, as far as the participants were concerned, it was their perceptions on the impact of performance measurement on their agency, which were associated with performance information use for decision making. The results suggest that ultimately, it is what the participants think about PIs which matters the most. Their evaluation of what PIs have done for their agency appears to considerably shape their use of performance information for decision making.

DISCUSSION

This study attempts to develop an explanatory model on the utilization of performance information which better responds to the activities of actors in public agencies. Amongst the five factors (the agency's PI system, organizational culture, stakeholder support, external environment, and the attitudes on the impact of PIs in the agency), two of these – the agency's PI system, and the officials' attitudes on the impact of PIs in the agency – were individually found to be significantly related to the use of PIs for decision making.

Under the combined model, only one factor was found to play a significant role in the use of performance information for decision making. It was an individual's conviction about the benefits that performance measurement has brought to the agency. The significance of perceptions has earlier been raised by Nutt (2005, p.293): 'How things are viewed and understood by stakeholders holds more salience than the accuracy of claims'. It appeared that what mattered most to the participants was not that their agency's PI system was good or had the desirable characteristics. They had to be convinced that the system has produced positive results for their agency. The more the participants perceive that performance measurement would benefit their agency, the more likely they would integrate the PIs into the agency's decision making process. It seems that performance information would be used most when they are judged by the participants to work best for their agency, and vice versa.

This study did not find a significant association between decision making and three factors – organizational culture, external environment and stakeholder support. These factors were not

found to be significantly related to the use of PIs for decision making. The relative insignificance of the external political environment has been earlier reported by Boyne *et al.* (2004). Their study on a group of British local authorities reported that the planning problems encountered in these authorities were largely technical rather than political.

This study's insignificant finding on stakeholder support contradicts earlier reports on performance measurement. Past empirical studies had emphasized the importance of stakeholder support for the successful implementation of performance measurement in agencies (De Lancer Julnes and Holzer 2001; Yang and Hsieh 2007). In his survey of local government councils, Ho (2006) stated that stakeholder support is critical for ensuring that performance information is used in city council decision making. This research, however, found that support for an agency's performance measurement by external political and internal organizational stakeholders did not have a considerable influence on its use of performance information for internal decision making. One possible reason for the insignificant role of stakeholder support, notably from politicians, may lie with the reported lack of interest amongst Australian politicians on performance measurement. Mulgan's (2008) content analysis of a sample of estimates committee hearings with six Australian Commonwealth departments shows that the senators have largely ignored the formalized outcomes-and-outputs reporting framework to pursue their own agendas. Similarly, the Western Australian State Office of the Auditor General (2008) notes that the senators' use of terms associated with performance measurement, such as PI and benchmark, in the state Parliament during the period between 1997 to 2006, have not been matched by a considerable increase in their interest in performance measurement over this period. The participants' close proximity with performance measurement in their agencies means that they

are likely to be aware of the low interest in and even lip service paid to performance measurement by these stakeholders, as evident in their response of ‘somewhat agree’ to the variable measuring stakeholder support. If they are convinced that they cannot depend on these stakeholders to support and encourage the application of performance measurement in their agency, then it is possible that their use of PIs for decision making will not be considerably affected by these stakeholders.

The interpretation of the results should, however, proceed with caution. First, although the results mainly confirm a model that is well supported in theory, it is important not to draw general conclusions from such a small sample. This initial analysis should be followed up with studies on larger Australian samples before any generalization can be made about performance information use in the Australian context. The results certainly do not suggest that performance measurement use for decision making is shaped in the same way across all national cultures. Future studies could test the model with data collected from other countries. Second, as with all cross-sectional designs, causality cannot be guaranteed. For instance, just as it is possible that a high quality PI system may promote the use of PIs for making decisions, it is equally possible that the integration of PIs into the decision making process may contribute to an improved PI system. In reality, the relationships among the factors may be dynamic and reciprocal, reflecting mutual causality. Qualitative inquiries are necessary in the future to develop process-based understanding of how factors affect one another in a longer period of time. Third, this study has focused on specific individual, structural and technical, cultural, and external factors. It does not, for example, include formalization and red tape under structural factors. Future studies should

take into account other aspects of these study variables in order to better explain performance information use for decision making.

Finally, this study's reliance on self-reported data to assess variables such as performance information use for decision making may affect the validity of the results. Most of the participants' close proximity to PIs in their agencies relative to other organizational members may affect their responses. It is possible for the findings to show a more positive view on performance information use amongst Australian state agencies than otherwise would have been the case. The fact that these individuals who are expected to be most receptive to performance measurement are found to hold a reserved view of performance measurement and adopt a cautious approach to using PIs for decision making may suggest that the situation on the use of performance information across the public sector for internal decision making could be more restrained. However, more extensive research on a larger sample should be undertaken before any conclusions can be made. Despite the limitations, this study is one of the few that addresses how perceived individual, structural, cultural and external contexts affect employee actions. Although this is a preliminary model validated by findings from a small sample, it suggests that the understanding of the use of performance information for decision making in public agencies cannot be separated from the officials' perceptions on what is judged to work best for their agency.

REFERENCES

Allison, G.T. 1969. 'Conceptual Models and the Cuban Missile Crisis', *American Political Science Review*, 63, 3, 689-718.

Ammons, D.N. 2001. *Municipal Benchmarks: Assessing Local Performance and Establishing Community Standards.* Thousand Oaks, CA: Sage.

Ammons, D.N. and W.C. Rivenbark. 2008. 'Factors Influencing the Use of Performance Data to Improve Municipal Services: Evidence from the North Carolina Benchmarking Project', *Public Administration Review*, 68, 2, 304-18.

Argyris, C. and D. Schön. 1996. Organizational Learning: A Theory of Action Perspective. 2nd ed. Reading, MA: Addison-Wesley.

Audit Office of New South Wales. 2006. *Auditor-General's Report: Performance Audit: Agency use of Performance Information to Manage Services.* Sydney: Audit Office of New South Wales.

Bouckaert, G. 1993. 'Measurement and Meaningful Management', *Public Productivity and Management Review*, 17, 31-44.

Boyne, G.A., J. Law and R.M. Walker. 2004. 'Problems of Rational Planning in Public Organizations: An Empirical Assessment of the Conventional Wisdom', *Administration and Society* 36, 3, 328-50.

Bozeman, B. and S.K. Pandey. 2004. 'Public Management Decision Making: Effects of Decision Content', *Public Administration Review*, 64, 5, 553-65.

Brudney, J.L., F.T. Herbert and D.S. Wright. 1999. 'Reinventing Government in the American States: Measuring and Explaining Administrative Reform', *Public Administration Review,* 59, 19-30.

De Lancer Julnes, P. and M. Holzer. 2001. 'Promoting the Utilization of Performance Measures in Public Organizations: An Empirical Study of Factors Affecting Adoption and Implementation', *Public Administration Review,* 61, 6, 693-708.

Enticott, G., G.A. Boyne and R.M. Walker. 2008. 'The Use of Multiple Informants in Public Administration Research: Data Aggregation Using Organizational Echelons', *Journal of Public Administration and Research Theory,* 19, 229-53

Fiol, C.M. and M.A. Lyles. 1985. 'Organizational Learning', *Academy of Management Review*, 10, 4, 803-13.

Fischer, F. 1986. 'Reforming Bureaucratic Theory: Toward a Political Model', in Calista, D. (ed.), *Bureaucratic and Governmental Reform*. Greenwich, CT: JAI Press.

Grizzle, G.A. and C.D. Pettijohn. 2002. 'Implementing Performance-Based Program Budgeting: A System-Dynamics Perspective', *Public Administration Review,* 62, 1, 51-62.

Henri, J.F. 2006. 'Organizational Culture and Performance Measurement Systems', *Accounting, Organizations and Society*, 31, 1, 77-103.

Ho, A.T.K. 2003. 'Perceptions of Performance Measurement and the Practice of Performance Reporting by Small Cities', *State and Local Government Review,* 35, 3, 161-73.

Ho, A.T.K. 2006. 'Accounting for the Value of Performance Measurement from the Perspective of Midwestern Mayors', *Public Administration Research and Theory,* 16, 2, 217-37.

Kim, P.S., K.H. Lee and C.Y. Roh. 2006. 'Promoting a High-Performance Culture in Government', *ASPA/EGPA A Performing Public Sector: The Second Trans-Atlantic Dialogue.* 1-3 June, Leuven, Belgium: Katholieke Universiteit Leuven.

Kravchuk, R.S. and R.W. Schack. 1996. 'Designing Effective Performance-Measurement Systems Under the Government Performance and Results Act of 1993', *Public Administration Review,* 56, 4, 348-59.

Leavitt, B. and J. March. 1990. 'Chester I. Barnard and the Intelligence of Learning', in Williamson, O.E. (ed.), *Organization Theory: From Chester Barnard to the Present and Beyond*, New York: Oxford University Press.

Lipshitz, R., M. Popper, and S. Oz. 1996. 'Building Learning Organizations: The Design and Implementation of Organizational Learning Mechanisms', *Journal of Applied Behavioral Science*, 32, 3, 292-305.

Mahler, J. 1997. 'Influences of Organizational Culture in Learning in Public Agencies', *Journal of Public Administration Research and Theory*, 7, 4, 519-40.

Martin, S. and P.C. Smith 2005. 'Multiple Public Service Performance Indicators: Toward an Integrated Statistical Approach', *Journal of Public Administration Research and Theory*, 15, 599-613.

Meier, K. 2000. *Politics and the Bureaucracy: Policymaking in the Fourth Branch of Government.* 4th edn., Fort Worth, TX: Harcourt.

Meier, K.J. and L.J. O'Toole Jr. 2001. 'Managerial Strategies and Behavior in Networks: A Model with Evidence from U.S. Public Education', *Journal of Public Administration Research and Theory*, 11, 271-93

Moynihan, D.P. 2005. ‘Goal-Based Learning and the Future of Performance Management’, *Public Administration Review*, 65, 2, 203-16.

Moynihan, D.P. 2006. ‘What Do We Talk About When We Talk About Performance? Dialogue Theory and Performance Budgeting’, *Journal of Public Administration Research and Theory*, 16, 2, 151-68.

Moynihan, D.P. and S.K. Pandey. 2005. ‘Testing How Management Matters in an Era of Government by Performance Management’, *Journal of Public Administration Research and Theory*, 15, 3, 422-39.

Mulgan, R. 2008. ‘The Accountability Priorities of Australia Parliamentarians’, *Australian Journal of Public Administration*, 62, 4, 457-69.

Noordegraaf, M. 2006. ‘How Policy Organizations Deal With Outcome-Based rules for Regulatory Action’, *ASPA/EGPA A Performing Public Sector: The Second Trans-Atlantic Dialogue*. 1-3 June, Leuven, Belgium: Katholieke Universiteit Leuven.

Nutt, P.C. 2005. ‘Comparing Public and Private Sector Decision-Making Practices’, *Journal of Public Administration Research and Theory*, 16, 1, 289-318.

Office of Auditor General for Western Australia. 2006. *Auditor General’s Report: Audit Results Report by Ministerial Portfolios at 11 November 2005*. Perth: Auditor General for Western Australia.

Office of Auditor General for Western Australia. 2008. *Key Performance Indicators: Where Are They Now?* Perth: Auditor General for Western Australia.

O’Toole, L.J., Jr. and K.J. Meier. 2003. ‘Plus ça Change: Public Management, Personnel Stability, and Organizational Performance’, *Journal of Public Administration Research and Theory*, 13, 1, 43-64.

Phillips, L.W. 1981. ‘Assessing Measurement Error in Key Informant Reports: A Methodological Note on Organizational Analysis in Marketing’, *Journal of Marketing Research*, 18, 395-415.

Quinn, R.E. and J.R. Kimberly. 1984. ‘Paradox, Planning, and Perseverance: Guidelines for Managerial Practice’, in Kimberly, J.R. and R.E. Quinn (eds.), *Managing Organizational Translations*. Homewood, IL: Dow Jones-Irwin.

Rubenstein, R., A.E. Schwartz and L. Stiefel. 2003. ‘Better Than Raw: A Guide to Measuring Organizational Performance with Adjusted Performance Measures’, *Public Administration Review*, 63, 5, 607-15.

Sanger, M.B. 2008. **‘**From Measurement to Management: Breaking through the Barriers to State and Local Performance’, *Public Administration Review*, 68, special issue, S70-S85.

Schein, Edgar. 1992. *Organizational Culture and Leadership*. 2nd ed. San Francisco: Jossey-Bass.

Senge, Peter. 1990. *The Fifth Discipline*, New York: Doubleday.

Smith, P.C. 1995. ‘On the Unintended Consequences of Publishing Performance Data in the Public Sector’, *International Journal of Public Administration*, 18, 2-3, 277-310.

Snow, C.C. and L.G. Hrebiniak. 1980. ‘Strategy, Distinctive Competence and Organizational Performance’, *Administrative Science Quarterly*, 25, 317-35.

Streib, G.D. and T.H. Poister. 1999. ‘Assessing the Validity, Legitimacy, and Functionality of Performance Measurement Systems in Municipal Governments’, *American Review of Public Administration*, 29, 2, 107-23.

Taylor, J. 1999. *The Impact of Performance Indicators on the Work of University Academics: A Study of Four Australian Universities*, PhD dissertation, Perth, Australia: Murdoch University.

Taylor, J. 2001. 'The Impact of Performance Indicators on the Work of University Academics: Evidence from Australian Universities', *Higher Education Quarterly*, 55, 1, 42-61.

Taylor, J. 2006. 'Performance Measurement in Australian and Hong Kong Government Departments', *Public Performance and Management Review*, 29, 3, 334-57.

Taylor, J. 2007. 'The Usefulness of Key Performance Indicators to Public Accountability Authorities in East Asia', *Public Administration and Development*, 27, 341-52.

Vakkuri, J. and P. Meklin. 2006. 'Ambiguity in Performance Measurement: A Theoretical Approach to Organisational Uses of Performance Measurement', *Financial Accountability & Management*, 22, 3, 235-50.

Wang, X.H. and E. Berman. 2001. 'Hypotheses About Performance Measurement in Counties: Findings From a Survey', *Journal of Public Administration Research and Theory*, 11, 3, 403-28.

Willoughby, K.G. and J.E. Melkers. 2000. 'Implementing PBB: Conflicting Views of Success', *Public Budgeting and Finance*, 20, 1, 105-20.

Yang, K.F. and J.Y. Hsieh. 2007. 'Managerial Effectiveness of Government Performance Measurement: Testing a Middle-Range Model', *Public Administration Review*, 67, 5, 861-79

Yang, K.F. and S.J. Pandey. 2008. 'How Do Perceived Political Environment and Administrative Reform Affect Employee Commitment? *Journal of Public Administration and Research Theory*, 19, 335-60.

Zammuto, R.F. and J.Y. Krakower. 1991. ‘Quantitative and Qualitative Studies of Organizational Culture’, *Research in Organizational and Development,* 5, 83-114.

Table 1 Descriptive Statistics and Intercorrelations

Variables	Mean (S.D.)	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1. Decision making	3.625 (.914)																
2. External political environment	4.022 (.972)	.318															
3. Stakeholder support	4.799 (.966)	.291	.016														
4. Rational organizational culture	4.913 (.623)	.310	,395	.405													
5. Hierarchical organizational culture	4.390 (1.254)	.613	.106	.394	.018												
6. Group organizational culture	4.146 (.882)	.145	-.221	-.145	-.101	.038											
7. Developmental organizational culture	3.704 (.881)	-.304	-.128	.284	.338	-.374	.163										
8. Performance measurement system	4.603 (.995)	.700	.271	.219	-.060	.536	-.084	-.489									
9. Attitudes on the impact of PIs	3.965 (1.012)	.744	-.039	.056	-.102	.605	.251	-.296	.681								
10. Gender	.338 (.338)	.265	.023	.104	-.308	.494	.239	-.256	.207	.254							
11. Age	3.788 (1.003)	-.211	-.195	-.423	-.022	-.339	.106	.280	-.347	-.060	-.598						
12. Length of service	9.382 (7.040)	.073	-.223	.085	.094	-.015	.090	.210	-.246	-.100	-.092	.545					
13. Employment	.896 (.252)	.095	.183	-.124	-.167	.096	.030	.065	-.113	-.061	.271	.292	.428				
14. Job position	.754 (.348)	.645	-.241	.173	-.020	.446	.080	-.430	.468	.593	.139	-.193	.050	-.248			
15. Size of agency	2.517 (.398)	.323	-.069	.204	-.013	.489	-.016	-.207	.379	.488	.089	-.385	-.517	-.372	.403		
16.Employees in immediate unit	37.383 (50.368)	-.120	-.084	.008	.220	.198	-.279	-.217	.004	.036	-.154	-.188	-.237	-.436	.130	.213	
17. State	1.325 (.467)	-.575	-.593	-.137	-.468	-.287	-.005	-.120	-.197	-.224	-.121	.096	-.015	-.341	-.191	-.137	-.074

Notes:

Response scale for three variables: decision making, external environment, and PI system: 1 = none whatsoever, 2 = close to negligible, 3 = less than sometimes, 4 = sometimes, 5 = more than sometimes, 6 = frequently, 7 = all the time.

Response scale for remaining dependent variables: 1 = strongly disagree, 2 = disagree, 3 = somewhat disagree, 4 = neutral, 5 = somewhat agree, 6 = agree, 7 = strongly agree.

$R^2 \geq \left| .436 \right|$ is significant at 0.05 level of significance or lower.

Table 2 Regressions Explaining Performance Information Use for Decision Making

Independent variable	Base model	1st model	2nd model	3rd model	4th model	5th model	Combined model
	Beta (S.E.)	Beta (S.E.)	Beta (S.E.)	Beta (S.E.)	Beta (S.E.)	Beta (S.E.)	Beta (S.E.)
Gender	.074 (.739)	.099 (.546)	-.034 (.829)	.141 (.835)	.163 (.652)	-.279 (.500)	-.134 (.512)
Age	-.073 (.272)	.028 (.203)	.017 (.265)	.065 (.365)	.057 (.243)	-.496 (.187)*	-.261 (.207)
Length of service	.107 (.033)	.216 (.024)	-.004 (.033)	.008 (.041)	.206 (.029)	.238 (.020)	.172 (.016)
Employment	-.064 (1.040)	-.106 (.769)	-.113 (1.051)	-.067 (1.076)	-.074 (.905)	-.031 (.635)	-.004 (.522)
Job position	.501 (.559)*	.274 (.453)	.336 (.596)	.517 (.584)*	.639 (.516)**	.177 (.392)	.197 (.412)
Size of agency	.104 (.536)	.077 (.396)	-.053 (.568)	.063 (.581)	.215 (.481)	-.146 (.352)	-.080 (.303)
Employees in immediate unit	-.252 (.004)	-.180 (.003)	-.419 (.003)	-.235 (.004)	-.252 (.003)	-.270 (.002)*	-.334 (.002)
State	-.491 (.410)*	-.447 (.304)*	-.375 (.467)	-.483 (.425)	-.171 (.462)	-.429 (.252)**	-.223 (.333)
PI system		.492 (.142)*					.051 (.136)
Organizational culture:							
Rational			.301 (.334)				.313 (.162)
Hierarchical			.388 (.181)				.110 (.122)
Group			.071 (.179)				.028 (.087)
Developmental			-.284 (.214)				-.197 (.172)
Stakeholder support				.133 (.233)			-.015 (.150)
External political environment					.477 (.211)		.107 (.138)
Attitudes on the impact of PIs						.697 (.143)**	.540 (.141)*
Adjusted R-square	.468	.710	.626	.431	.597	.802	.923
F	3.087	6.170	3.650	2.599	4.132	9.540	15.281
p	.043	.004	.047	.076	.019	.001	.023

Level of significance, p: * = p < .05; ** = p < .01; *** = p < .001.

Appendix Measurement of Main Study Variables

Performance use for decision making

Seven-point Likert scale, where 1 = none whatsoever, 2 = close to negligible, 3 = less than sometimes, 4 = sometimes, 5 = more than sometimes, 6 = frequently, 7 = all the time.

Five items: PIs influence my decision or my team's decision. I and/or my team use PIs in conjunction with other information (e.g., expert advice) to reach a decision. I and/or my team use PIs to prompt further questions or enquiries. I and/or my team use PIs to support a decision reached by other means (e.g., experience). I and/or my team use PIs to correct a decision reached by other means when the PIs conflict with that decision.

External environment

Similar response scale.

Five items: How often are you concerned about the following? (a) The information in PIs can be used by the media against my program/unit/agency;(b)The information in PIs can be used by the public against my program/unit/agency; (c) The information in PIs can be used by others against my program/unit/agency.

How often does the following exert an influence over your unit/agency? (a) Public opinion; (b) Media opinion.

PI system

Similar response scale.

Eight items: The PIs measure what they are meant to measure. The PIs are easy to understand. The PIs are linked to a specific goal, desired outcome or objective that is being measured. The PIs are easy to access. The PIs have stretching but achievable performance targets. The PIs meet your performance information needs. The PIs are subject to regular performance audits. The PIs are subject to regular reviews and updated when appropriate.

Stakeholder support

For this and remaining variables: Seven-point Likert scale, where 1 = strongly disagree, 2 = disagree, 3 = somewhat disagree, 4 = neutral, 5 = somewhat agree, 6 = agree, 7 = strongly agree.

Four items: My CEO/department head supports performance measurement in this agency. Most managers in my agency support performance measurement in this agency. Most employees in my agency support performance measurement in this agency. Most state ministers support performance measurement in my agency.

Rational culture

Three items: My unit/agency is very production oriented. A major concern is with getting the job done. Most people in my unit/agency are not personally involved.

Hierarchical culture

Two items: My unit/agency is a very formalized and structured place. Bureaucratic procedures generally govern what people do around here.

Group culture

Three items: My unit/agency is a very personal place. It is like an extended family. Most people in my unit/agency seem to share a lot of themselves.

Developmental culture

Two items: My unit/agency is a very dynamic and entrepreneurial place. Most people in my unit/agency are willing to stick their necks out and take risks.

Attitudes on PIs

Four items: Performance measurement has brought more advantages than disadvantages to my unit/agency. The accountability of this unit/agency has improved mainly because of performance measurement and reporting. The performance of this unit/agency has improved mainly because of performance measurement. Decision making in this unit/agency has improved mainly because of performance measurement.