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Review of Management Control Systems in Their Organizational and Environmental Context Managerial Perspective and Control Typology

Raili Pollanen

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Abstract

This paper provides a critical review of literature on management controls and their context. The review indicates that more emphasis has been placed on organizational than environmental factors and that the effectiveness of different controls in different contexts remains practically unaddressed. In general, research has been *ad hoc* and focused on results-oriented financial controls, short-term efficiency, and individual level of analysis. Even for commonly studied topics (e.g., budget controls), evidence has often been inconsistent and limited to manufacturing organizations, with little integration and refinement of previous theoretical models based on new evidence. Further research is required to investigate the relative importance of different financial and nonfinancial controls in different types of organizations in order to develop more comprehensive performance measurement and management frameworks.

About the author

Dr. Pollanen is an Assistant Professor of Accounting at the Sprott School of Business. Her research focuses on performance measurement and control systems, and her recent work has been funded by research grants from the Canadian Academic Accounting Association, Canadian Institute of Chartered Accountants, and Association of Public Service Financial Administrators. She has published in *Accounting, Organizations and Society*, *International Journal of Public Sector Management*, and several professional outlets and conference proceedings. She is also a coauthor of *Management Accounting*, (Canadian 6th ed). She has served on the Performance Reporting Task Force of the Canadian Institute of Chartered Accountants, Public Sector Accounting Board, and held a Saskatchewan Accounting Education Foundation Faculty Fellowship at the University of Regina.

Sprott Research Program
research@sprott.carleton.ca

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Raili Pollanen
Spratt School of Business

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Author contact: Dr. Raili Pollanen, E-mail raili_pollanen@carleton.ca

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Review of Management Control Systems in Their Organizational and Environmental Context: Managerial Perspective and Control Typology

Introduction

Research on management control systems in their organizational and environmental context has been advocated for the past thirty years (e.g., Bruns & Waterhouse, 1975; Hopwood, 1978; Chenhall, Harrison, & Watson, 1981; Otley, 1984; Otley, Broadbent, & Berry, 1995; Chenhall, 2003). Reviews of theoretical premises of management control systems (Merchant & Simons, 1986; Otley et al., 1995; Whitley, 1999) and specialty topics, such as the use of budgetary criteria in performance evaluation (Briers & Hirst, 1990; Hartmann & Moers, 1999) and the effects of national culture on management controls (Harrison & McKinnon, 1999), have appeared. However, comprehensive up-to-date reviews of the role of management controls in their organizational and environmental context in contemporary organizations are not available. Yet, such research is important, as they can help researchers and practitioners understand the circumstances under which specific management controls are, or are not, effective.

Management control as a specialized field of management has evolved during the past four decades. Management control was defined by Anthony (1965, cited in Anthony, 1988, p. 190), in a traditional manner, as “the process by which managers assure that resources are obtained and used effectively and efficiently in the accomplishment of the organization’s objectives”. Efficiency is generally understood to be concerned with achieving given results with minimum resources and effectiveness with attaining organizational objectives. Although this definition appears to be concerned with organizational factors, such as strategy and resource usage, it positions management control as a middle-management function. As such, it considers strategy and objectives as given and operational task controls outside the domain of management control. However, Anthony’s definition has been criticized for its emphasis on accounting-based controls and for its exclusion of the planning and operations functions, as well as, environmental influences (Machin, 1983; Lowe & Puxty, 1989; Emmanuel, Otley, & Merchant, 1990; Otley et al., 1995). The exclusion of planning results in a short-term focus, with no regard for the fact that, for long-term success and survival, it is necessary for organizations to anticipate and actively seek new opportunities and to adapt to their environment (Hannan & Freeman, 1977; Trist, 1976). Furthermore, the exclusion of operations ignores nonfinancial controls, which are necessary for the control of day-to-day operational activities. Given these limitations, management control, in essence, becomes indistinguishable from management accounting.¹

A more balanced and comprehensive approach to management control is reflected in the definition proposed by Lowe (1971, p. 5), who defined management control systems as follows:

A system of organizational information seeking and gathering, accountability, and feedback designed to ensure that the enterprise adapts to changes in its substantive environment and that the work behaviour of its employees is measured by reference to a set of operational sub-goals (which conform with overall objectives) so that the discrepancy between the two can be reconciled and corrected for.

Lowe's definition emphasizes the overall control necessary for successful adaptation by organizations to their environment. In addition to embracing conventional controls, it also recognizes planning, feedback, and necessary corrective actions as integral elements of effective management control systems, as well as, nonfinancial controls and the behavioural implications of controls as important considerations in effective control processes. This comprehensive organizational approach is more flexible and, therefore, more relevant to contemporary organizations, which are generally leaner, flatter, smaller, and operate in increasingly competitive and uncertain environments (Otley, 1994). The organizational approach, which is grounded in social psychology rather than strictly in economics, has been adopted as the basic premise in many theoretical articles and textbooks (Lowe & Machin, 1983; Chua, Lowe, & Puxty, 1989; Emmanuel et al., 1990; Otley, 1987; Berry, Broadbent, & Otley, 1995). Relying on this broader conceptualization of management control, Otley et al. (1995), in their review of the development of management control research, called for research recognizing, not only the organizational context of management control systems, but also the environment in which organizations operate.

Research on management control systems in their organizational and environmental context has typically entailed a theoretical foundation based on contingency theory (Bruns & Waterhouse, 1975; Gordon & Miller, 1976; Hayes, 1977; Waterhouse & Tiessen, 1978; Otley, 1980; Tiessen & Waterhouse, 1983). Contingency theory is based on the premise that no single best or universalistic management control system exists, but that an appropriate system depends on various organizational and environmental factors. Otley and Wilkinson (1988) in particular warned that simple contingent models are inadequate, because they ignore many essential attributes of effective control systems and overall organizational effectiveness. Consequently, they developed a minimum contingent framework that focuses on overall organizational control. This framework, in addition to incorporating both accounting and nonaccounting controls, is also concerned with organizational objectives and strategy, as well as, other contextual and external factors that may affect overall organizational effectiveness. As such, this framework represents a balanced and pragmatic approach, capable of providing guidance for the design of management control systems. Although not without criticism as theory conceived to justify inconsistent and contradictory findings (e.g., Otley, 1980; Otley & Wilkinson, 1988; Chapman, 1997; Fisher, 1998), contingency theory can provide significant insight into the antecedents and consequences of management control systems. In addition, although some reservations have been expressed by critical theorists (Lowe & Machin, 1983; Chua et al., 1989; Lowe & Chua, 1983)², it is plausible to assume from the pragmatic managerial perspective that the primary objective of management control systems is to help existing managers achieve their organizational objectives.

This comprehensive analytical review study extends previous research by focusing on different types of management controls, by incorporating several contextual factors, and by highlighting the role of management controls in performance management in contemporary organizations. No known study has attempted to evaluate the literature with respect to both the contextual factors and the types of

controls simultaneously. Consistent with Lowe's (1971) definition, this study adopts the managerial perspective. Consequently, the scope of the study encompasses the elements of planning, i.e., feedforward control, and the evaluation of actual performance against plans, i.e., feedback control, as a basis for taking necessary corrective actions. However, it excludes a complex and diverse body of literature with sociological and ideological underpinnings (Tinker, Merino, & Neimark, 1982; Lowe & Machin, 1983; Chua, 1986; Chua et al., 1989; Macintosh, 1994) in order to limit the scope of this work to a reasonably manageable size. This paper consists of three main sections: context of management controls, types of management controls, and conclusions and future research opportunities.

Context of Management Controls

The context in which management controls operate can affect the appropriateness of different types of controls. Controls operate within the unique situational settings of organizations, which, in turn, operate within their broader environment. Examples of research studies that have examined various organizational and environmental factors are reviewed in this section and summarized in Table 1. For the purposes of this review, organizational factors are defined as elements internal to organizations over which organizations can exercise a reasonable degree of control, whereas environmental factors are external forces that are largely uncontrollable by organizations at least in the short term.³ The Table also classifies the studies by the types of controls and by the level of the study. The typology developed by Merchant (1985b, 1998) is used to classify controls, and it is discussed in detail in the next section. No known study has attempted to evaluate the literature using this framework. The level of the studies is classified as individual, unit, and organizational, depending on the level of the relationships with which the studies are primarily concerned.⁴ Although the level of the study has been addressed previously, no clear consensus has been reached as to the most appropriate level. Finally, the Table also outlines the primary research method, the variables studied, and the major findings of each study.

Only empirical studies that have investigated the use or effectiveness of management control systems in different organizational and/or environmental contexts are included in Table 1, although relevant theoretical studies may also be discussed in the analyses, as appropriate. Significant further theory development or refinement based on the empirical results reported is also mentioned, as applicable. In essence, the studies included in Table 1 examine the use or usefulness of different control system characteristics in different contexts⁵, and/or outcomes of management control systems in different contexts. Outcomes, in turn, can include performance at managerial, unit, and organizational levels, as well as, behavioural outcomes, such as job satisfaction and job-related tension. Although most studies included come from well-known accounting and management journals, the Table is not necessarily exhaustive.⁶ Nevertheless, the studies included provide abundant typical examples of research on management controls in their organizational and environmental context. The remainder of this section reviews some key studies that have focused on the organizational and environmental contexts of management control systems.

[Table 1]

Organizational Context

Organizations are unique entities consisting of people, physical resources, systems, and structures, all of which collectively provide management controls their organizational context. Organizational factors specifically discussed in this section are: structure, size, strategy, systems, individual characteristics, and ownership. Strategic planning establishes broad organizational goals, and organizational structure outlines the formal organizational relationships, as well as, provides a basis for establishing responsibility and accountability relationships. Furthermore, organizational size and individual characteristics can influence the types of management controls that are appropriate and feasible, and the existing systems can provide further opportunities or constraints for implementing controls. Finally, the nature of organizational ownership can pose limitations for effective management controls in some organizations. All of these factors can either facilitate or hinder the effective design and use of management controls.

Structure, Size, and Strategy

Structure, size, and strategy have been identified as important and interdependent contextual factors affecting management controls by several researchers, e.g., by Bruns and Waterhouse (1975), Merchant (1981, 1985c), Govindarajan and Gupta (1985), and Waterhouse and Svendsen (1998). After Bruns and Waterhouse obtained some early evidence on the relationships between management control systems, particularly budget controls, organizational structure, and size, Waterhouse and Tiessen further theorized that management controls may be contingent on organizational structure, as different types of controls may be appropriate under centralized and decentralized structures. Some empirical evidence exists to support this proposition. For example, Chenhall and Morris (1986) found that more aggregated and integrated information was useful in decentralized organizations than in centralized organizations. Brownell (1985) found a relationship between functional differentiation and the use of participative budgeting, with participation being more effective in research and development than in marketing functions. Mia and Chenhall (1994) discovered a stronger association between the use of broad management accounting systems (MAS) and performance in marketing than in production functions. Merchant (1981) found that formal administrative budgeting processes related to improved performance in large organizations, which are quite often decentralized, but informal interpersonal processes improved performance in small organizations, which are often centralized. Hoque and James (2000) reported that larger organizations used balanced scorecards more extensively than small organizations. Chenhall (2003) considered size as an important contextual factor, but noted that size has not often been explicitly studied, as most studies have been conducted only in relatively large organizations.

Of the three factors, strategy is the most frequently studied factor. For example, Merchant (1985c) concluded that the effects of controls can vary depending on strategy and be stronger in businesses with growth strategies. Govindarajan and Gupta (1985) further extended this line of inquiry to encompass reward systems and found that subjective long-term criteria, but not short-term criteria, in determining managers' bonuses enhanced or hampered effectiveness depending on subunit strategy. Simons (1987) showed that prospector companies emphasized forecast data, tight budget goals, and output monitoring, but that defender companies emphasized rewards based on budget achievement and stable control systems. Waterhouse and Svendsen (1998) reported some fit between nonfinancial performance measures and strategic priorities in the areas of operations and environmental issues, but

a great need for improvement in the areas of innovation and external stakeholder relations. Van der Stede (2000) found that the units with differentiation strategy, as well as, more profitable units, were subject to less rigid budget controls and higher budgetary slack. Malina and Selto (2001) found the balanced scorecard to be effective for controlling strategy, but discovered tension between top and middle management about its use as communication, control, and evaluation tool. Lillis (2002) argued that when performance measures conflict, looser controls and multiple measures can facilitate strategy implementation. Baines and Langfield-Smith (2003) found that increasingly competitive environment increased focus on differentiated strategies. Jermias and Gani (2004) concluded that the units with product differentiation strategies used both output controls and behavioural controls more intensively than the units with low-cost strategies. Bisbe and Otley (2004) discovered that the interactive use of management control systems promoted product innovation only in low-innovation firms, whereas it hindered innovation in high-innovation firms. These studies provide significant, although not conclusive, evidence on the importance of strategy in the design of effective management control systems.

Information Systems

The sophistication of accounting and other information systems and the manner in which information produced by such systems is used are also key considerations in effective management control. These systems must produce relevant and timely information for various decision making and control purposes in a cost-effective manner, and such information must be used prudently in order to encourage desirable behaviours and to discourage dysfunctional behaviours. The extant systems research has focused, to a large extent, on budget control systems. Early studies were mainly concerned with the behavioural and motivational effects of budgets and budget participation (Argyris, 1952; Stedry, 1960; Schiff & Lewin, 1968; Hofstede, 1968; Searfoss & Monczka, 1973; Swieringa & Moncur, 1975). Subsequent studies further examined budget use in organizations, suggesting several antecedents and consequences of budget systems (Hopwood, 1972; Otley, 1978; Bruns & Waterhouse, 1975), as well as, general characteristics of management accounting and budgeting systems (Gordon & Narayanan, 1984; Chenhall & Morris, 1986; Merchant, 1981, 1985a; Williams et al, 1990; Abernethy & Stoelwinder, 1991; Moores & Yuen, 2001; Gerdin, 2005).

In particular, the apparently contradictory findings of Hopwood (1972) and Otley (1978) with respect to the perceived effects of budget-constrained evaluative style, led to a series of studies proposing contingent factors, such as responsibility structure and uncertainty (Hirst, 1981, 1983; Brownell, 1982; Brownell & Hirst, 1986; Hirst, 1987; Govindarajan, 1984; Dunk, 1989; Brownell & Dunk, 1991; Lau, Low, & Eggleton, 1995; Ross, 1995; Otley & Pollanen, 2000).⁷ For example, Otley (1978), and later Brownell (1982), suggested that budget-based measures of performance may be more appropriate in profit centres than in cost centres. This proposition was supported by a larger proportion of nonaccounting styles found in cost centres by Hopwood (1972) and Brownell (1982) than in substantially independent profit centres by Otley. However, Brownell's study has been criticized on methodological grounds (Briers & Hirst, 1990; Vagneur & Peiperl, 2000; Otley & Fakiolas, 2000), but insufficient research has been carried out in an effort to validate these findings and methods. Overall, the available evidence comes from studies focusing on some narrow, albeit important, topics and has been methodologically challenged. Therefore, the appropriate role of accounting and other information systems in effective management control is still far from being resolved.

Individual Characteristics

Individual characteristics, such as leadership style, the locus of control, professional orientation, and reputation are internal qualities of individuals that can also affect the appropriateness of management controls. Individuals possess different degrees of such inherent qualities, which can also be shaped to a certain extent by organizational policies and peer pressure. Argyris (1952) and DeCoster and Fertakis (1968) suggested that leadership style can influence the budgetary pressure exerted by superiors, and Ansari (1976) implied that leadership style can also interact with systems design characteristics. Subsequently, Hopwood (1974b), in an empirical study, found that the structure-oriented leadership style was associated with the budget-constrained evaluative style, which, in turn, was associated with job-related tension.⁸ Although this finding is consistent with the proposition of DeCoster and Fertakis, it was not confirmed by Merchant (1985c). More recently, Otley and Pierce (1995) found that the leadership style characterized by high (low) structure and low (high) consideration was related to the highest (lowest) level of dysfunctional behaviours, and that these relationships were moderated by environmental uncertainty.

With respect to the locus of control, Brownell (1981) reported budgetary participation to have a positive impact on performance of “internals”, who generally believe that they can exert significant influence over their own lives, but a negative impact on performance of “externals”, who feel that their lives are greatly determined by chance, luck, and fate. This result was also confirmed by Frucot and Shearon (1991). As to reputation, Webb (2002) found that possessing a reputation for budget accuracy is associated with lower budget slack. Finally, professional orientation accompanied with administrative controls in bureaucratic organizations can result in role conflict (Kahn et al., 1964) due to differing professional and organizational norms and values (Aranya & Ferris, 1984; Abernethy & Stoelwinder, 1995). Abernethy and Stoelwinder found that such conflict can be reduced by minimizing output controls, and that reduced conflict had a positive effect on job satisfaction and performance. Overall, some evidence, albeit limited, exists on the importance of individual characteristics in management control systems design.

Ownership

Although the basic concepts of management control apply to both private and public organizations, management control in public organizations is generally limited by characteristics, such as ambiguous objectives, fixed revenues, and difficulties in measuring outcomes. Under these circumstances, planning becomes primarily a political process with a short-term focus, and often involves extensive negotiation and bargaining (Henley, Holtham, Likierman, & Perrin, 1986; Anthony & Young, 1994; Wildavsky, 1975, 1992). Furthermore, cost centres are typically the only possible responsibility structure for accountability purposes due to the lack of profit orientation (Anthony & Young, 1994). Consequently, financial control in the public sector is essentially limited to budget-based controls focused on allocating fixed resources, authorizing expenditures, and ensuring balanced budgets.⁹ Nevertheless, budgets are also commonly used for performance evaluation purposes due to the lack of other more appropriate bases (Otley, 1987).

However, emphasis on budgetary criteria in evaluation, particularly when combined with incrementalism and other short-cut methods commonly used to facilitate budget preparation in the public sector, has been observed to result in game behaviours, with possible dysfunctional

consequences (Wildavsky, 1975, 1992; Smith 1993). Although empirical evidence in the public-sector context is rare, five notable examples are provided by Williams, Macintosh, and Moore (1990), Abernethy and Stoelwinder (1991, 1995), Smith (1993), and Abernethy and Brownell (1999). Williams et al. (1990) found that budgeting as a whole was related to departmental performance, but to different degrees in different task environments. Abernethy and Stoelwinder (1991) reported that the fit between budgeting, task uncertainty, and system goal orientation was associated with improved performance, and Abernethy and Stoelwinder (1995) concluded that professionalism mitigated role conflict associated with administrative output controls. Abernethy and Brownell (1999) found that the interactive budget use can mitigate the disruptive performance effects of strategic change. Finally, Smith(1993) identified seven dysfunctional consequences of inappropriate use of performance indicators. Regardless of these examples of research in public organizations, very little comparative work between the public and private sectors and among the different types of public and nonprofit organizations exists.

Environmental Context

Beyond the organizational setting, there are also broader environmental factors, such as technological, economic, competitive, cultural, social, regulatory, and political influences, that affect organizations and also their management control systems.¹⁰ In one of the pioneering studies on this topic, Khandwalla (1972) recognized the impact of competitive environment on the design of appropriate management control systems. Modern organizations operate in the increasingly competitive global environment, characterized by rapid technological change, as well as, in political environment, subject to laws, regulations, and ideology of the governments in power. Furthermore, organizations have to be sensitive to the diverse cultural backgrounds of their customers, employees, and other stakeholders, as well as, to current social issues and trends. All these factors can create uncertainty, to which organizations must adapt in order to survive and prosper, although some control over them may be possible in the long run, e.g., through strategic renewal and lobbying initiatives.

Uncertainty

It has been widely recognized that uncertainty may complicate control system design. For example, Otley (1978), referring to economic uncertainty, suggested that increased emphasis on budget-based evaluative styles in managerial evaluation may be appropriate under tight, and presumably certain, economic conditions but not in more liberal and uncertain environments. A similar explanation was also proposed by Imoisili (1989) who, under tight economic conditions, found primarily accounting-based evaluative styles. However, the tightness of economic conditions was not directly measured in either study, and it was only offered as one possible *post hoc* explanation for some apparently contradictory results.

Uncertainty has more commonly been defined in terms of task uncertainty and environmental uncertainty. Several management control frameworks have been based on Perrow's (1967) technology dimensions (Waterhouse & Tiessen, 1978; Banbury & Nahapiet, 1979; Macintosh, 1981). According to Perrow, routine tasks, which have also been referred to as programmable, analyzable, and low-variety tasks, result in low task uncertainty, whereas nonroutine tasks, which have also been called nonprogrammable, unanalyzable, and high-variety tasks, result in high task uncertainty. In addition to Perrow's typology, broader conceptualizations of uncertainty by Thompson (1967),

Duncan (1972), and Galbraith (1977) also consider environmental influences. Thompson's concept of uncertainty incorporates the notions of repetitiveness, i.e., the frequency with which tasks are performed, and openness, i.e., the susceptibility of operations to environmental uncertainty. Accordingly, the tasks that are both nonrepetitive and open to significant outside influences are referred to as high-uncertainty tasks, and the tasks that are both repetitive and closed to significant outside influences are referred to as low-uncertainty tasks. A related concept is interdependence, which has been defined as task interdependence or organizational interdependence (Gerdin, 2005; Bouwens & Abernethy, 2000; Williams et al., 1990; Chenhall & Morris, 1986; Macintosh and Daft, 1987). Furthermore, uncertainty has been defined in terms of predictability of key external factors by Duncan and in terms of availability of adequate information by Galbraith.

With respect to uncertainty in management control research, it has been argued that budget controls and other accounting-based controls are most effective under the conditions in which routine tasks are performed and uncertainty levels are relatively low (Hayes, 1977; Waterhouse & Tiessen, 1978; Otley, 1978). On the other hand, nonfinancial controls, such as personnel and behavioural controls and nonfinancial performance measures, could be more effective under the conditions of high uncertainty (Abernethy & Brownell, 1997; Davila, 2000; Chenhall, 2003). However, the conceptualization and measurement of uncertainty in different studies have been inconsistent. For example, Gordon and Narayanan (1984), in a study on relationships between management control systems and environmental uncertainty, measured uncertainty in terms of predictability of various aspects of economic, technological and competitive environments; whereas, Chenhall and Morris (1986), in a study with similar objectives, measured it in terms of lack of environmental information, inability to assign probabilities to success and failure, and not knowing outcomes of incorrect decisions. In another example, Hirst (1983) theorized that accounting measures are inappropriate under environmental uncertainty, but used a measure of task uncertainty; whereas, Ross (1995) examined relationships between task uncertainty and performance measures, but used a measure of environmental uncertainty. In spite of such variations, some evidence exists for the potential detrimental effects of uncertainty. However, because of the conceptual and methodological interdependence of internal and external uncertainty, uncertainty is treated as an external factor in this study.

Culture

Culture is another environmental factor that has received significant attention in the management control literature. However, a clear distinction does not exist between organizational culture and national culture. Organizational culture, which is based on shared norms, values, philosophies, and organizational practices, has been viewed as a potential internal source of control that can be, at least partly, managed and manipulated (Langfield-Smith, 1995). It would, therefore, be best classified as an organizational factor. On the other hand, national culture, which is based on characteristics unique to different nations, is largely uncontrollable by organizations. Although Hofstede's (1980, 1997) five cultural dimensions¹¹ have been criticized for ignoring sociological, anthropological, and historical perspectives (Harrison and McKinnon, 1999; Bhimani, 1999), they have been used almost exclusively in management control research to measure both national and organizational culture (O'Connor, 1995; Harrison, 1992, 1993; Merchant, Chow, & Wu, 1995; Chow, Shields, & Wu, 1999). A rare recent exception is provided by Henri (2006), who captured organizational culture using two characteristics: flexibility and control orientation.

Some support exists for cultural differences in the use of management controls, although most studies have examined differences between national cultures, instead of organizational cultures. Harrison (1993) found in a study of Australian and Singaporean managers that participation accompanying budgetary criteria in evaluation was related to reduced tension regardless of culture, and that budgetary criteria was associated with reduced tension and increased job satisfaction in a culture characterized by high power distance and low individualism. Merchant et al. (1995) found less long-term incentives being used in Taiwanese firms than in US firms. Chow et al. (1999) concluded that the Taiwanese national culture was an important determinant of management controls used by the Japanese, Taiwanese, and US firms located in Taiwan, as these firms appeared to have adjusted their controls to reflect the prevailing controls and employee preferences in the host country firms. O'Connor (1995) found that, in the culture with low power distance, increased participation in budget setting was associated with reduced role ambiguity and improved superior-subordinate relations. Henri (2006) found that senior management teams used performance measures and PMS systems more strategically in Canadian firms with flexibility dominant organizational culture than in firms with control dominant culture.

Types of Management Controls

Management control systems consist of various control mechanisms, both financial and nonfinancial. Research on all types of controls that form a complete organizational control package is useful, as a different mix of controls may be available in and appropriate for different types of organizations, and as different controls may serve as substitutes for one another. In general, a control package, which is appropriately designed, implemented, and used, can serve as a useful planning, feedback, and motivational mechanism in effective organizational performance management. Additional work on control taxonomies and their relationships to management control systems was promoted, among other things, by Chenhall (2003) in order to promote further research in this area. Although several classifications of management controls exist (e.g., Hopwood, 1974a; Ouchi, 1977; Hofstede, 1981; Whitley, 1999; Simons, 1995, 2000)¹², Merchant's (1985b, 1998) control framework is used in this study. Merchant's framework is considered to be the most appropriate framework for the purposes of this study, as it classifies controls by object of control, encompasses both financial and nonfinancial controls, and includes controls available through personnel, cultural, and social means.

In accordance with Merchant (1985b, 1998), Table 1 classifies the types of controls into result, action, and personnel (cultural) controls. For the purpose of this study, the result controls category includes studies which examine financial and nonfinancial performance targets, for which managers can be held accountable, or surrogate measures for these targets. The action controls category includes rules, procedures, and physical constraints to protect property and data. The personnel (cultural) controls category includes corporate policies for hiring and retaining employees, as well as, self-control and social control by peers. Because the main objective of participative budgeting and standard setting, which are frequently studied topics, is to motivate and retain employees, they are classified as personnel controls in this study. On the other hand, personal characteristics, such as leadership style and the locus of control, which are not directly controllable by organizations or their policies, are excluded from personnel controls and are treated as other organizational factors. For each control category, Table 1 also indicates examples of the typical control system characteristics

studied, e.g., budgetary criteria, performance measures, rewards, etc.¹³ Figure 1 summarizes the number of studies that have examined results controls, action controls, and personnel (cultural) controls, or combinations of the three categories. Each control category is discussed next, giving examples of control techniques and their effectiveness.

[Figure 1]

Result Controls

Management controls referred to in the conventional management control literature are often results controls, as demonstrated graphically in Figure 1. The Figure indicates that 39 studies of the 65 studies reviewed dealt only with result controls, and all others dealt with result controls in some combination with action and/or personnel controls. This category includes well-known studies that have examined the effectiveness of budget controls, such as Hopwood (1972; 1974b), Otley (1978), Bruns and Waterhouse (1975), Brownell (1982), Merchant (1981, 1984, 1985a), Govindarajan (1984), and Govindarajan and Gupta (1985), and numerous subsequent studies following this tradition. In general, result controls involve holding individuals accountable for planned results and rewarding them based on actual results. Result controls can be either financial or nonfinancial, as managers can be responsible for the achievement of predetermined financial targets, such as budgeted revenues and expenses, or nonfinancial targets, such as budgeted production and staff levels. Therefore, result controls inherently encompass the input, process, output, and outcome controls of the traditional process-oriented approach (Simons, 2000). Under this approach, managers can be held accountable for inputs, i.e., the quantity of resources used; processes, i.e., the efficiency of resources used; outputs, i.e., the quantity of work completed; and outcomes, i.e., the effectiveness or work completed. Although input and process controls do not directly relate to ultimate outcomes or results, they can serve as important indicators of results, particularly under the circumstances in which outputs and outcomes are difficult to measure. Effective result controls empower employees to take actions that are necessary for accomplishing the desired results and, therefore, can influence actions and outcomes by forcing employees to be concerned with the consequences of their actions.

The implementation of effective result controls involves four stages: defining performance dimensions, setting performance targets, measuring performance, and providing appropriate rewards (Merchant, 1998). Performance dimensions represent key result areas in which good performance is essential, and performance targets set specific objectives for performance in each area. In order for the employees to focus on important tasks and behaviours, performance dimensions and targets must be congruent with the organization's strategy and objectives. Appropriate performance targets can enhance motivation by providing goals for which individuals can strive. The appropriate difficulty of performance targets has been discussed extensively in the goal setting literature (Locke, 1968; Tosi, 1975; Locke & Latham 1990).¹⁴ Regardless of target difficulty, performance measurement provides processes and tools for assessing the extent to which performance targets have been achieved.

Care should be exercised in selecting an appropriate number of representative financial and nonfinancial measures for each performance dimension, including input, process, output, and outcome measures, as a common adage in performance measurement is, "What you measure is what you get" (Kaplan & Norton, 1992). Finally, rewards are an important final step in result control

systems in order to close the control loop (Merchant, 1989). Rewards should be designed to recognize and encourage good performance and to improve substandard performance. Such rewards can be financial, e.g., increased pay and bonuses, or nonfinancial, e.g., promotion, recognition, and additional responsibilities. Although research on performance measurement and incentives is still in its infancy, two studies provide some contradictory evidence.¹⁵ Smith (1993) identified seven dysfunctional behaviours associated with excessive reliance of performance measures. However, Scott and Tiessen (1999) found that team performance was positively associated with a variety of financial and nonfinancial performance measures, and further enhanced by participation in target setting and emphasis on team performance in compensation. Therefore, it appears that well-designed result controls can constitute a powerful control tool, particularly when combined with results-based rewards.

However, result controls cannot be used effectively under all conditions. Although result controls can be applied at different levels, i.e., individual, group, and organizational levels, they are effective only when the desired result dimensions can be controlled to a considerable extent by the individuals in charge of them, and when results can be measured reasonably well. Therefore, they can be particularly useful for controlling organizations with established technology and certain environments, in which desired outcomes can be relatively easily measured (Waterhouse & Tiessen, 1978; Bruns & Waterhouse, 1975; Hayes, 1977; Otley, 1978; Hirst, 1983; Govindarajan, 1984) and also operations in which outcomes are measurable but the knowledge of the transformation processes for achieving the outcomes is imperfect, such as in research and development operations (Ouchi, 1977). Some evidence also exists indicating that result controls, such as tight budget controls, can be effective in centralized organizations and units (Brownell, 1985; Chenhall & Morris, 1986; Mia & Chenhall, 1994). On the other hand, result controls can also be effective in relatively independent responsibility centres, such as profit and investment centres in which the four necessary control conditions identified by Otley (1980) are met reasonably well.¹⁶ Result controls can also be more effective under defender strategies than prospector strategies (Govindarajan & Gupta, 1985; Van der Stede, 2000; Chenhall, 2003; Jermias & Gani, 2004).

On the behavioural side, result controls can be effective for promoting motivation, as they can induce employees to produce desired results by ensuring that desirable actions also maximize employees' preferred rewards (Hofstede, 1980, 1997). However, result controls do not directly address personal limitations, such as the lack of skills and motivation (Merchant, 1985b, 1998). The use of result controls may also be limited in public organizations, in which it is usually difficult to implement performance-based rewards due to difficulties in measuring outcomes, and in professional organizations, in which peer reviews may be perceived as the only appropriate form of evaluation by professionals (Abernethy & Stoelwinder, 1995; Abernethy & Brownell, 1997; Otley & Pierce, 1995; Otley & Pollanen, 2000). In addition, the effectiveness of different types of controls can also vary based on individual characteristics, such as locus of control, professionalism, and reputation (Brownell, 1981; Frucot & Shearon, 1991; Abernethy & Stoelwinder, 1995; Webb, 2002). It can be surmised that effective result controls are complex and contingent on several factors, and that, for effective overall organizational control, they must be supplemented by other forms of controls, i.e., action and personnel controls.

Action Controls

Action controls are concerned with ensuring that individuals perform only desirable actions (Merchant, 1985b, 1998). The object of control is an action or activity rather than a result or outcome. Action controls are nonfinancial in their nature and intended to encourage or force certain desirable actions and discourage or prevent undesirable actions. An underlying notion behind action controls is that desirable actions and activities can contribute indirectly towards the achievement of desirable results or outcomes. In this sense, action controls can serve as surrogates for result controls or as intermediate controls. However, as compared to result controls, action controls have the advantage of being proactive, i.e., primarily concerned with problem prevention, instead of being reactive, i.e., concerned only with problem detection and correction.

Action controls can take four basic forms: behavioural constraints, preaction reviews, action accountability, and redundancy (Merchant, 1998). Behavioural constraints include physical constraints, such as locks, passwords, and limited access areas, as well as, administrative constraints, such as expenditure limits, restricted authority for decision making, segregation of duties, and rules and procedures. Behavioural constraints are intended to limit opportunities for potential unethical and fraudulent actions by employees and outsiders. Preaction reviews, on the other hand, subject plans to policy and procedural scrutiny and authorizations, possibly by several individuals or committees, before any action can be taken. Typical budgeting and capital budgeting processes are examples of preaction controls, as they provide a mechanism for the justification and approval of planned expenditures. Action accountability involves holding employees accountable for their actions in accordance with predetermined policies, procedures, and codes of conduct. Action accountability can be exercised as part of formal performance evaluation processes. Therefore, like result accountability, it can provide a mechanism for corrective actions. Finally, redundancy involves assigning more human or physical resources to critical tasks as a backup or precautionary measure than is ideally necessary, e.g., a standby operator or a backup power source or data, in order to allow a cost-effective and timely recovery of key operations in cases of major failures. Although action controls include traditional internal controls designed to safeguard assets against theft and waste, the concept of action controls is broader, as it also embraces action accountability.

Like result controls, action controls are more appropriate in some situations than in others. Certain conditions are necessary for behavioural constraints, the most common type of action controls, to be appropriate. These conditions are similar to those for result controls: the ability to identify desirable and undesirable actions, to reasonably control the occurrence of such actions, and to correct undesirable actions (Merchant, 1998). Therefore, behavioural constraints may be appropriate for simple tasks and processes, for which the three criteria can be met relatively easily, and also for complex tasks that can be divided into simple subtasks (Waterhouse & Tiessen, 1978). Behavioural constraints can also be highly valuable for operations in which safeguarding of assets or information is of utmost importance, e.g., in financial institutions. Although adequate preaction reviews and authorizations are important in any operations, they assume a critical role in organizations and activities in which outcomes are difficult to control after an event has occurred, e.g., in many discretionary public programs and research activities. Under these circumstances, action accountability is also important as intermediate control. Redundancy, on the other hand, is important for operations in which a failure of the critical system would cause undue delay or loss, e.g., in

hospital emergency rooms. Just as for ensuring the achievement of desired results, adequate performance measures are required for ensuring the achievement of desired actions.

Only a few empirical studies provide evidence on the use of action controls in different contexts. For example, Merchant (1985c) found that discretionary program expenditures were affected by financial, headcount, procedural, and other controls, and that the effects of these controls varied depending on strategy, the chairman's control style, and the accounting treatment of expenditures. Macintosh and Daft (1987) discovered that under pooled interdependence, more standard operating procedures and less budget and statistical reports were used, whereas under sequential interdependence more statistical and budget reports than operating procedures were used. More recently, Jermias and Gani (2004) found that units with product differentiation strategy used both output controls and behavioural controls more intensively than units with low-cost strategy. Based on the scant empirical evidence, it is evident that additional research is required to examine the effectiveness of action controls, and their interrelationships with other controls, in different contexts.

Personnel (Cultural) Controls

Personnel (cultural) controls, like action controls, are nonfinancial in their nature, and they include not only controls available through personnel functions and processes but also cultural, social, and self-controls (Merchant, 1985b, 1998). For convenience, they are referred to as personnel controls in the remainder of this paper. Personnel controls thus include explicit policies and processes for hiring and retaining employees, organizational norms and values imbedded in organizational culture, social control exercised through group memberships, and self-control stemming from intrinsic motivation. Self-control is achieved primarily through self-monitoring based on personal values and beliefs and is founded on trust and the premise that self-respect and self-satisfaction, resulting from doing a good job, serve as adequate motivators for good performance. On the other hand, social control, also called interpersonal control, is achieved primarily through mutual monitoring and rewarding of group members' behaviours by other members in accordance with group norms, rewards, and sanctions. As such, neither self-control nor social control can be purposely designed by organizations, beyond recruiting individuals with desirable attributes and providing them a supportive organizational climate.

Control through personnel and cultural processes can be achieved through several methods. First, potential for control through personnel processes exists in the areas of selection, training, job design, and resources (Merchant, 1998). Selection and placement of employees may be the single most important element in an organization's control system. Finding individuals with proper education, experience, skills, attitudes, personality, and motivation to match the specific job requirements is prerequisite for a motivated and productive workforce. In order to address potential deficiencies due to personal limitations, training can be provided to new employees on job skills, organizational values, norms, and expectations, as well as, to existing employees as a professional and personal development vehicle. Properly designed jobs, in conjunction with adequate resources, provide qualified and motivated employees a high probability of successfully completing the assigned tasks and, at the same time, an appropriate level of challenge. Secondly, control through organizational culture may take the form of codes of conduct, reward systems, job rotation, physical and social arrangements, and support by top management (Merchant, 1998). Organizational norms and values

may be expressed in formal codes of conduct, which provide guidelines for expected behaviours and a mechanism for corrective actions or, alternatively, expressed informally simply as “the way we do things around here” (Peters & Waterman, 1982). In addition, job rotation and proper physical and social arrangements, such as open-concept offices, corporate slogans, and dress codes, can also enhance the socialization of individuals in organizations. Appropriate incentives can further reinforce conformance to organizational norms and values. Cultural control can also be facilitated through management behaviours that are consistent with organizational policies and procedures.

Whereas action and result controls could be difficult to implement in some organizations, personnel controls are generally available in most organizations. For example, personnel placement, training, and rewards can be used by all organizations with employees to provide employees with the necessary direction, skills, and incentives to perform well (Merchant, 1998). Although personnel controls are implicitly part of any organization’s personnel function, they can be relatively more important in some contexts than in others. They are especially useful in organizations with nonroutine tasks and uncertain environments (Waterhouse & Tiessen, 1978), e.g., in many public organizations, in which typical result and action controls may not be possible or feasible, as well as, in professional bureaucracies (Mintzberg, 1979), in which highly educated professionals work relatively independently with little or no direct supervision. Common examples of personnel controls in these circumstances are the use of peer and self-evaluations and the delegation of decision making to committees. Personnel controls in general are also becoming increasingly more important in many contemporary organizations characterized by a relatively flat organizational structure and a wide span of control (Otley, 1994). Under all these circumstances, personnel controls may be used to compensate, at least partly, for the unavailability of other forms of control. However, unlike result and action controls, personnel controls cannot be used directly as a basis for result and action accountability, as they do not require specific behaviours or actions by employees.

The most common examples of studies involving personnel controls come from the participative budgeting literature, although personnel controls are typically examined with result controls, and sometimes also with action controls, rather than alone. A large number of studies have investigated, among other issues, the effects of participation in budget and standard setting (Bruns & Waterhouse, 1975; Brownell, 1981; Brownell, 1982; Brownell, 1985; Merchant, 1985a; Brownell & Hirst, 1986; Hirst, 1987; Dunk, 1989; Brownell & Dunk, 1991; Frucot & Shearon, 1991; Harrison, 1992; Lau et al., 1995; Chow et al., 1999; Scott & Tiessen, 1999; Otley & Pollanen, 2000; Shields et al., 2000). Managers supposedly have a choice to institutionalize either the top-down (autocratic) or the bottom-up (participative) approach into budget and standard setting processes. As such, the participative approach represents a management control tool, controllable by management, and thus falls under personnel controls.

Another area of research that involves personnel controls is reward systems. As for participation, the objective of reward systems is to motivate employees to perform their duties in an effective and goal-congruent manner. As a potential behaviour-altering tool, rewards are a form of personnel control. Examples of studies which have explicitly or implicitly considered rewards include those by Simons (1987), Merchant et al. (1995), Chow et al. (1999), Scott and Tiessen (1999), Shields et al. (2000), and Fullerton and McWatters (2002). Examples of studies that have considered some control elements from all three categories in a more integrative manner are the studies of Merchant (1985c),

Abernethy and Stoelwinder (1995), Abernethy and Brownell (1997), and Groot and Merchant (2000). Merchant included financial, headcount, and procedural controls; Abernethy and Stoelwinder focused on performance targets, behavioural monitoring, and professional controls; Abernethy and Brownell examined professional controls and rules and procedures; and Groot and Merchant considered policies and procedures, approval processes, setting and monitoring performance targets, hiring and training processes, and rewards. Beyond these examples, very little attention has been paid to the relative importance of different types of controls in different types of organizations and contexts.

Conclusions and Future Research Opportunities

The literature review revealed that more research emphasis has been placed on organizational than environmental context, and that the effectiveness of different types of controls remains mostly unaddressed. In general, such research has been *ad hoc* and short-term focused, and concerned primarily with efficiency, rather than effectiveness, and with individual level factors, instead of organizational and systems level factors. Even for the areas for which a significant amount of empirical evidence exists, e.g., budget controls, such evidence has often been inconsistent, with very little integration and refinement of theoretical models based on new evidence. Furthermore, the existing research has almost exclusively focused on result controls, with very little attention paid either to the relative importance of different types of controls or to the extent and manner in which they are used in different types of organizations.

The dominance of budget-based result controls can be understood by considering the context of the organizations studied. As most studies reviewed were conducted in manufacturing organizations, it is not surprising that financial result controls emerged as the main control type. Manufacturing organizations, particularly those operating in competitive mature industries, need to be highly concerned with cost control and profitability merely to survive. Although economic activity in the contemporary society has shifted from manufacturing to services, researchers have been slow to pay significant attention to other forms of controls that might be more relevant in nonmanufacturing organizations. Three examples of such work are the studies of Abernethy and Stoelwinder (1995), Abernethy and Brownell (1997), and Otley and Pierce (1995), with the first two being conducted in the health care sector and the third in audit firms. As both types of organizations operate in professional environments in which personnel controls are expected to increase in importance, all three studies, in fact, examined some forms of personnel controls. Furthermore, as outcomes are difficult to measure in public and professional services, action controls also gain importance as a mechanism for controlling processes. This proposition is supported by the emphasis placed on action controls in both Abernethy and Stoelwinder's and Abernethy and Brownell's studies. In addition, Abernethy and Brownell considered the effects of uncertainty and found evidence of the effectiveness of personnel controls, as opposed to results and actions controls, under the conditions of high task uncertainty.

The above-mentioned examples demonstrate that a fit between management controls and their context can have serious consequences in contemporary organizations, but such relationships are not understood well, yet. The existing findings can make only a modest cumulative contribution to the management control literature and provide only limited guidance for effective organizational performance management, particularly in public organizations. In an effort to address such research

voids, at least in part, four areas for possible further study are discussed in the remainder of this section: organizational context, environmental context, performance measurement and management, and methodology.

First, two aspects of organizational context, in particular, are considered to benefit from further study: ownership and organizational culture. In spite of increasing demands for fiscal accountability and the early development of budget control theory in public organizations (Wildavsky, 1975), most studies have been conducted in the private sector, primarily in manufacturing organizations. However, as measurement issues seriously limit result controls in public organizations, other forms of control, i.e., action and personnel controls, may become relatively more important. It can be argued that a continuum of appropriate controls may, in fact, exist, as one moves from technology-oriented manufacturing businesses to service businesses and further to nonprofit and government organizations. The range of available controls becomes narrower, as technical, inventory, and profit-based controls become progressively more limited. Therefore, result controls, particularly financial controls, may be relatively more important in manufacturing organizations, and personnel and action controls relatively more important in public organizations, with various service organizations in the middle benefiting from all three types of controls. Research in different public organizations, as well as, comparative research between the private and public organizations, the profit-oriented and nonprofit organizations, and the manufacturing and nonmanufacturing organizations would be useful in order to shed some further light on potential sectoral differences. In addition, organizational culture may also affect the effectiveness of controls in organizations, as individuals in positions to influence organizational culture may possess different management styles and value systems, tolerance for uncertainty, and views of power relationships. However, the impact of organizational culture, as opposed to national culture, remains essentially unaddressed. In such work, the conceptualization and measurement of organizational culture, beyond Hofstede's (1980, 1997) cultural dimensions, poses a serious challenge, as well as, an opportunity. Therefore, it appears that organizational context can offer some interesting future research opportunities.

Secondly, critical accounting theorists argue that, in addition to technological and cultural environments commonly studied, social and political environments are also important considerations in designing management control systems. They are fundamentally concerned with power relationships and inequality in organizations and society (Cooper, 1981; Tinker et al., 1982; Lowe & Machin, 1983; Chua, 1986; Chua et al., 1989; Puxty, 1993; Macintosh, 1994; Lehman, 1996). Based on ideological underpinnings, critical theorists consider management controls to be affected by social and political forces, subject to power games and manipulation, not as neutral unbiased instruments that can be effectively designed and used. Consequently, they question the assumption of rationality, which is necessary for setting objectives and for determining and measuring outcomes effectively. More recently, gender issues have also been noted to warrant attention. For example, Maier (1999) argued that masculine characteristics, such as hierarchical relationships, task orientation, autocratic leadership, and competition, are valued and prevalent in typical organizations, leading to biased masculine substructures. Furthermore, Lehman (1996) maintained that accounting, as a masculine discipline, is important for sustaining such masculine substructures. Regardless of these theoretical developments, little empirical research has been conducted beyond technological and cultural environments, particularly on the relative importance of the traditional and more critical issues in management control systems design. Although the two paradigms may remain irreconcilable due to

the inherent complexity of the issues involved, research effort in this area, nevertheless, could provide some guidance to control systems designers by raising awareness of pertinent critical issues.

Third, the role of performance measurement in management control and effective organizational performance management deserves serious attention. Performance measurement can improve organizational efficiency and effectiveness by increasing the visibility of consequences of one's actions (Waterhouse & Tiessen, 1978) and, as such, serve as a mechanism for result and action accountability. Although budget-based financial information has commonly been used in performance measurement, effective organizational performance management requires tools and techniques beyond budget controls (Hope & Fraser, 1997), as financial measures imbedded in budgets may be effective only under certain conditions (Bruns & Waterhouse, 1975). Such a broader perspective to performance measurement has also been advocated, e.g., by Otley (1994), Otley et al. (1995), Otley and Pollanen (2000), and Kaplan and Norton (1992, 1993, 1996a, 1996b). Kaplan and Norton's balanced scorecard, which emphasizes nonfinancial measures related to internal process, innovation, and customer perspectives, in addition to traditional financial performance measures, is thus consistent with such a broader approach. The internal focus of the balanced scorecard necessitates tailoring performance measurement systems to fit the specific circumstances of industries and organizations. Given this premise, effective performance measurement and management systems may, indeed, be even more complex and contingent on their organizational and environmental context than previously recognized. Therefore, Otley's caution that the development of a comprehensive performance measurement framework should be based on sound empirical research of existing practices in various contextual settings is well warranted.

An issue related closely to performance measurement and management is the "tightness" or "looseness" of controls. Although this topic is mentioned in management control textbooks (Merchant, 1998; Anthony & Govindarajan, 1998), it has not been addressed directly in management control research, with the exception of literature dealing with the difficulty of budget targets (Merchant, 1990a; Merchant & Manzoni, 1989). Merchant (1998, p. 165) argued that tight controls are desirable, as they indicate "a high degree of assurance that people will behave as the organization wishes" and called for more research in this area. Although examples of tight controls were provided by both Merchant (1998) and Anthony and Govindarajan (1998), control tightness has not been concisely defined or measured, with the exception of an effort by Van der Stede (2001) to develop a measure of "tight budgetary control". Research on the appropriateness of budget and other controls becomes even more important given evidence that tight controls can be associated with negative behavioural consequences, such as data manipulation and suboptimal decisions (Hofstede, 1968; Wildavsky, 1975; Hopwood, 1972; Otley, 1978; Smith, 1993).

Fourth, most studies have focused on individual, as opposed to organizational, characteristics and relied on the cross-sectional survey method. Merchant (1981, 1984) argued that a major reason for some inconsistent results may be the narrow focus on the lowest or individual level of analysis, e.g., managerial performance, as opposed to systems level of analysis, e.g., unit and organizational performance. Merchant suggested that, instead of concentrating on several individual variables, such as budget participation and evaluative style, it may be useful to consider a limited number of broad dimensions, such as administrative and interpersonal uses of budgeting at the systems level. Consequently, Merchant proposed organizational and unit-level studies to enable a more general

examination of management controls in a broader context. The systems-based approach was considered particularly suitable for exploratory studies in large, complex organizations in which relationships in general may not be clear enough for formulating specific hypotheses. However, the literature review indicated that only a very few systems level studies exist in addition to a series of studies by Merchant (1981, 1984, 1985c).

While the survey method continues to be important, particularly for comparative research with an established body of research using the same method, broadening research methods deserves consideration. Case studies in particular are considered appropriate for studying exploratory topics, for which hypotheses development rather than hypotheses testing *per se* is the main focus, and a longitudinal design for comparing results over time. Furthermore, the replication of even the basic studies on the organizational and environmental context of controls, i.e., strategy, structure, technology, and culture, is considered useful, as the existing evidence is still *ad hoc* and somewhat inconsistent. Replication is the cornerstone of scientific inquiry (Kerlinger, 1986; Lindsay, 1995; Otley & Pollanen, 2000; Lindsay & Hubbard, 2000); however, it has not generally been embraced in management control literature. Replication studies should include multiple variables and measures in order to minimize potential confounding effects of omitted variables and to validate key measures for which inconsistent results exist. Such research design would address, in part, criticisms directed at budget control research (Briers & Hirst, 1990)

In conclusion, it is considered useful to broaden management control research to encompass overall organizational performance management. Such research entails the study of a balanced mix of controls that is essential for organizations to ensure the attainment of their objectives and to proactively manage their long-term strategy and performance under the prevailing environmental conditions. In particular, studies on the relative importance of different types of controls, e.g., result, action, and personnel controls, both financial and nonfinancial, in different settings would be beneficial. Similarly, research on the role of strategic performance measures would be valuable as a guide for overall organizational performance management. Careful attention also needs to be paid to broadening research methods and to ensuring both the reliability and validity of research findings. Such broader research objectives would ideally lead to comprehensive studies of the effects of control systems on external stakeholders and, ultimately, on the society at large. As new research evidence emerges in this still largely underresearched area, more specific relationships could be postulated and tested in an effort to develop more comprehensive performance measurement and management frameworks and practices.

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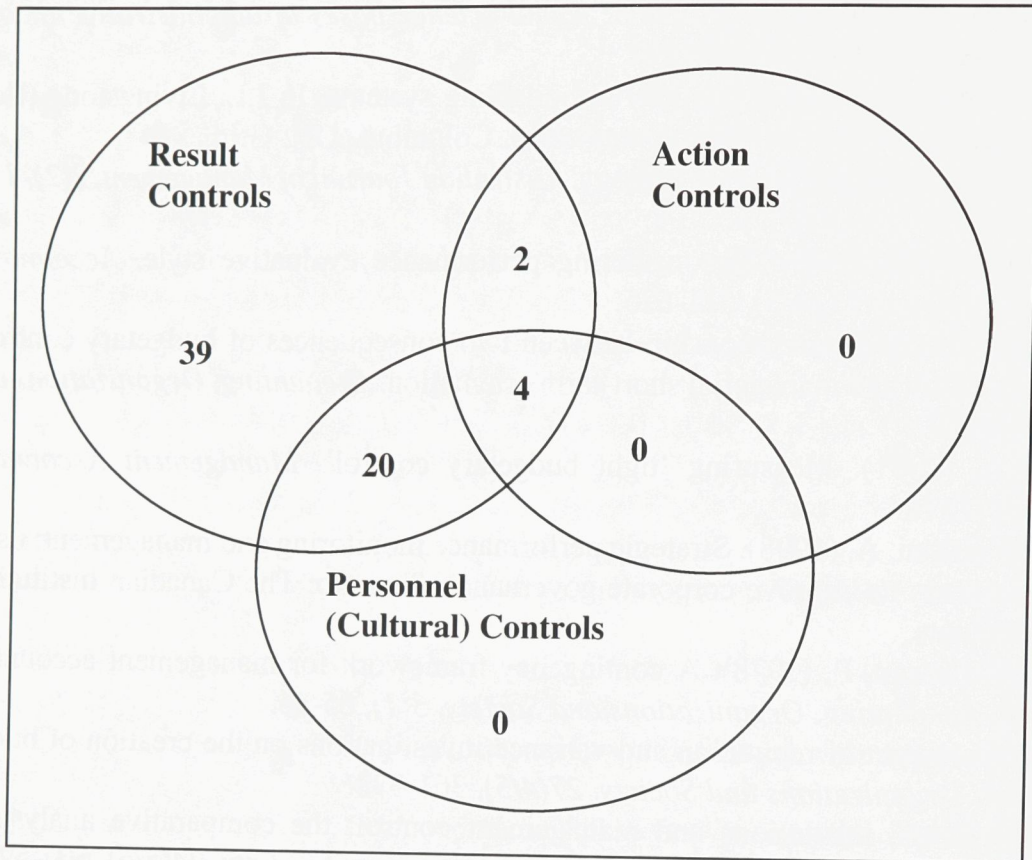
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Figure 1. Number of Studies by Type of Controls



Note: Controls are classified using Merchant's (1985b, 1998) control typology.

Table 1. Summary of Studies on Context and Type of Management Controls

	Study/ Source ^a	Research Method	Sample Type/Size	Level of Study/ Context Type	Control Type/ Characteristics ^b	Variables	Major Findings
1	Hopwood (1972)/ JAR	Theory, Survey, and Case	Manufacturing division of large US organization/ 167(20) cost centre managers	Individual/ Organizational	Result (Performance evaluation criteria, Budget control, Goal congruence)	Evaluative styles Job-related tension Interpersonal relations Invalid data reporting Cost-related tension	Managers evaluated based on budget- constrained style reported higher job- related tension, more manipulative behaviours, and poorer supervisor and peer relations than other managers.
2	Khandwalla (1972)/ JAR	Survey	92 manufacturing companies	Organizational/ Environmental	Result (Financial control)	Control system characteristics Competition	Price competition little effect, distributive competition modest effect, and product competition much greater effect on use of more sophisticated control systems.
3	Hopwood (1974b)/ AR	Survey and Case	Manufacturing division of large US organization/ 167(20) cost centre managers	Individual/ Organizational	Result and Personnel (Performance evaluation criteria, Budget control, Goal congruence)	Evaluative styles Leadership style Size Contagion effect	Managers with budget-constrained style showed less consideration and stronger contagion effect than others. Both budget-constrained and profit- conscious styles associated with the structure dimension of leadership style.
4	Bruns and Waterhouse (1975)/ JAR	Theory and Survey (Interviews)	26 organizations in US and Canada/ 284 managers	Organizational/ Organizational and Environmental	Result (Budget control)	Structure Budget use Size Technology	Higher budget participation and satisfaction with budget-related activities in structured organizations. Size and technology also related to structuring activities.
5	Otley (1978)/ JAR	Theory, Survey, and Case	Large manufac- turing organization in UK/ 39(41) profit centre managers	Individual/ Organizational and Environmental	Result and Personnel (Budget control, Performance evaluation criteria, Evaluation period, Goal congruence)	Evaluative styles Management philosophy Environmental conditions Size Budget accuracy Job-related tension Budget-related tension Job ambiguity Budgetary performance Long-run performance Interpersonal relations Invalid data reporting	A continuum of styles found. Budget- constrained style not related to either high job- or budget-related tension, or decreased job ambiguity, but related to meeting budgets. Styles affected by philosophy, size, and environmental conditions. Upward budget bias in unprofitable units.

6	Brownell (1981)/AR	Laboratory experiment	Manufacturing organization in US/40 + managers	Individual/Organizational	Result and Personnel (Budget control, Participation)	Budget participation Locus of control Managerial performance	Budget participation positively related to performance of "internals" but negatively to performance of "externals".
7	Merchant (1981)/AR	Survey	19 manufacturing organizations in US/170 managers	Organizational/Organizational	Result (Budget control)	Budget system characteristics Size Structure Intrinsic motivation Budget usefulness Organizational performance	Explained budgeting by aggregate administrative/interpersonal variables. Administrative (interpersonal) budgeting related to higher performance in large (small) organizations.
8	Brownell (1982)/JAR	Survey	Large manufacturing organization in US/38 cost centre managers	Individual/Organizational	Result and Personnel (Performance evaluation criteria, Budget control, Participation)	Budget emphasis Budget participation Job satisfaction Managerial performance	Compatible high-high and low-low combinations of budget participation and budget emphasis related to high performance. Findings not significant for job satisfaction.
9	Hirst (1983)/JAR	Survey	4 educational institutions in Australia/111 students	Individual/Organizational and Environmental	Result (Performance evaluation criteria, Financial control)	Reliance on accounting performance measures Task uncertainty Social withdrawal Job-related tension	Relationship between reliance on accounting performance measures and job-related tension is dependent on task uncertainty.
10	Gordon and Narayanan (1984)/AOS	Survey and Case (Interviews)	Senior managers in 34 US companies	Organizational/Environmental	Result (Financial control, Performance measures)	MAS characteristics Structure Environmental uncertainty	Both MAS and structure affected by uncertainty, but MAS and structure not related.
11	Govindarajan (1984)/AOS	Survey	8 Fortune 500 organizations in various industries in US/58 profit centre managers	Unit/Organizational and Environmental	Result (Performance evaluation criteria, Financial control)	Subjective/formula-based criteria Environmental uncertainty Departmental performance	Environmental uncertainty significant moderator between evaluative style and effectiveness. Higher (lower) uncertainty related to subjective (formula-based) style.
12	Merchant (1984)/AOS	Survey	19 manufacturing organizations in US/170 managers	Unit/Organizational	Result (Budget control)	Budget system characteristics Size Function Automation Departmental perf.	Larger organizations tended to use more administrative budgeting, more formal communications, and greater participation than smaller organizations. Performance higher when this fit existed.

13	Brownell (1985)/JAR	Survey and Case	Large multinational organization (R and D and marketing)/61(?) managers	Individual/Organizational and Environmental	Result and Personnel (Performance evaluation criteria, Budget control, Participation)	Budget emphasis Budget participation Environmental uncertainty Function Managerial performance	Participation had greater effect on performance in R and D than in marketing. Reduced reliance on accounting information appropriate in complex environment.
14	Govindarajan and Gupta (1985)/AOS	Survey	8 diversified US organizations/46 subunit managers	Unit/Organizational	Result (Performance evaluation criteria, Financial control, Evaluation period)	Short/long-run criteria Subjective formula-based criteria Business unit strategy Unit effectiveness	Long-run and subjective non-formula criteria for bonuses enhance (hamper) effectiveness under build (harvest) strategy.
15	Merchant (1985a)/AOS	Survey	19 manufacturing organizations in US/170 managers	Individual/Organizational and Environmental	Result (Budget control)	Budget system characteristics Technology Budget slack	Propensity to create slack lower when participation in budgeting high. However, such propensity higher if tight budget requires responses to avoid overruns.
16	Merchant (1985c)/AOS	Survey and Case (Interviews)	Decentralized US organization/54 profit centre managers	Unit/Organizational	Result, Personnel, and Action (Financial control, Performance measures, Rules and procedures)	Types of controls Leadership style Strategy Control style Expenditure accounting Unit performance	Discretionary program expenditures affected by financial, headcount, procedural, and other controls. Effects of controls vary depending on strategy, chairman's control style, and accounting treatment of expenditures.
17	Brownell and Hirst (1986)/JAR	Survey	Large manufacturing organization in Australia/76 cost and revenue centre managers	Individual/Organizational and Environmental	Result, and Personnel (Performance evaluation criteria, Budget control, Participation)	Budget emphasis Budget participation Task uncertainty Job-related tension Managerial performance	Compatible high-high and low-low combinations of participation and budget emphasis reduced job-related tension under low task uncertainty.
18	Chenhall and Morris (1986)/AR	Survey (Interviews)	Middle- and upper-level managers in 36 Australian manufacturing companies	Unit/Organizational	Result (Financial control, Reporting)	MAS usefulness Environmental uncertainty Structure Organizational interdependence	Decentralization associated with aggregated and integrated information; uncertainty with broad scope and timely information; and interdependence with broad scope and aggregated and integrated information.

19	Hirst (1987)/ AJM	Survey	Large property management organization in Australia/ 44 managers	Individual/ Organizational	Result and Personnel (Performance evaluation criteria, Budget control, Participation)	Budget emphasis Budget participation Managerial performance	Interaction between participation and budgetary criteria on performance negative but not significant.
20	Macintosh and Daft (1987)/ AOS	Case (Interviews)	20 manufacturing, service, and nonprofit organizations in US and Canada/ 90 managers	Unit/ Organizational	Result Action (Budget control, Reporting, Rules and Procedures)	Control system characteristics Departmental interdependence	Under pooled interdependence, more standard operating procedures and less budget and statistical reports used. Under sequential interdependence more statistical and budget reports than operating procedures used.
21	Simons (1987)/ AOS	Survey and Case (Interviews)	171 CEOs in 28 Canadian industries/ 12 senior general managers in 12 companies (interviews)	Organizational/ Organizational	Result (Financial control, Control tightness, Monitoring, Reporting, Rewards)	Control system characteristics Strategy Dynamism Size Profitability	Prospector companies emphasize forecast data, tight budget goals, and output monitoring; defender companies emphasize rewards based on budget achievement and stable control systems. Findings more applicable in large companies.
22	Dunk (1989)/ AOS	Survey	30 manufacturing organizations in UK/26 cost centre managers	Individual/ Organizational	Result and Personnel (Performance evaluation criteria, Budget control, Participation)	Budget emphasis Budget participation Managerial performance	Significant interaction between participation and budget emphasis affecting performance. High-low and low-high combinations related to high performance.
23	Imoisili (1989)/ AOS	Survey	3 large manufacturing organizations/ 120 cost centre managers	Individual/ Organizational and Environmental	Result (Performance evaluation criteria, Budget control)	Evaluative styles Task uncertainty Budget attitudes Job stress Managerial perf.	Only budget-based styles found. Budget-constrained managers reported higher job stress and more positive attitudes towards budgets regardless of task uncertainty and interdependency.
24	Merchant (1990b) AOS	Survey and Case (Interviews)	17 profit centre managers in 2 US Fortune 300 companies (interviews)/ 59 profit centre managers in one company (survey)	Individual/ Organizational and Environmental	Result (Financial control, Goal congruence, Evaluation period)	Pressure to meet financial targets Manipulation of performance measures Short-term orientation Environmental uncertainty Profit centre strategy Leadership style	Manipulative behaviours and short-term orientation revealed in both companies, and they associated with felt impact of financial controls. Some support for moderating effect of uncertainty.

25	Williams, Macintosh and Moore (1990)/ AOS	Theory and Survey	22 public organizations in Canada/ 201 managers	Unit/ Organizational	Result (Budget control)	Budget system characteristics Task interdependency Departmental performance	Budgeting as a whole significantly related to departmental goals under both reciprocal and pooled interdependencies.
26	Abernethy and Steelwinder (1991)/ AOS	Survey	4 large nonprofit hospitals in Australia/ 192 managers	Unit/ Organizational and Environmental	Result and Personnel (Budget control)	Budget system characteristics Task uncertainty System goal orientation Departmental performance	The fit between task uncertainty, budgeting, and system goal orientation related to improved performance.
27	Brownell and Dunk (1991)/ AOS	Survey	46 manufacturing organizations in Australia/ 79 managers	Individual/ Organizational and Environmental	Result and Personnel (Performance evaluation criteria, Budget control, Participation)	Budget emphasis Budget participation Task uncertainty Managerial performance	Brownell's (1982) finding holds only under low task uncertainty. Participation enhances performance under high task uncertainty, regardless of budget emphasis.
28	Frucot and Shearon (1991)/ AR	Survey	21 Mexican organizations/ 83 managers	Individual/ Organizational and Environmental	Result and Personnel (Performance evaluation criteria, Budget control, Participation)	Budget participation Locus of control Job satisfaction Managerial performance Culture	Locus of control and participation associated with performance but not with job satisfaction, and no cultural effects found.
29	Harrison (1992)/ AOS	Survey	28 merchandising organizations in Australia and Singapore/ 96/115 managers	Individual/ Organizational and Environmental	Result and Personnel (Performance evaluation criteria, Budget control, Participation)	Budget emphasis Budget participation Culture Job-related tension Job satisfaction	Participation accompanying budget emphasis related to reduced job-related tension, but not to increased job satisfaction. Results for participation generalizable across nations.
30	Harrison (1993)/ AOS	Survey	28 merchandising organizations in Australia and Singapore/ 127/128 managers	Individual/ Organizational and Environmental	Result (Performance evaluation criteria, Budget control)	Budget emphasis Culture Authoritarianism Job-related tension Job satisfaction	High (low) emphasis on budgets related to lower tension and higher job satisfaction in high (low) power distance/low (high) individualism culture. No support for effect of authoritarianism.
31	Smith (1993)/ BJM	Case	UK Nation Health Service, Maternity Services	Organizational/ Organizational	Result (Performance measures, Goal congruence)	Reliance on performance indicators Dysfunctional behaviours	Excessive reliance on performance indicators related to seven types of dysfunctional behaviours.

32	Mia and Chenhall (1994)/ AOS	Survey (Interviews)	12 manufacturing organizations/ 29 marketing and 46 production managers	Individual/ Organizational and Environmental	Result (Financial control, Use of control information)	MAS characteristics Task uncertainty Functional differentiation Subordinate performance	Association between use of broad scope MAS information and performance stronger in marketing than in production functions.
33	Abernethy and Stoelwinder (1995)/ AOS	Survey	Large hospital in Australia/ 91 physician and nurse subunit managers	Unit/ Organizational	Result, Action, and Personnel (Performance targets, Goal congruence, Monitoring, Professionalism)	Professional orientation Control environment Role conflict Subunit performance Job satisfaction	Role conflict between professional and bureaucratic norms and values reduced when high professional orientation not combined with administrative output controls. Reduced conflict related to higher job satisfaction and performance.
34	Lau, Low, and Eggleton (1995)/ AOS	Survey	80 manufacturing organizations in Singapore/ 112 managers	Individual/ Organizational and Environmental	Result and Personnel (Performance evaluation criteria, Budget control, Participation)	Budget emphasis Budget participation Task uncertainty Managerial performance	Budget emphasis combined with budget participation related to high performance under low task uncertainty, and participation alone related to uncertainty.
35	Merchant, Chow, and Wu (1995)/ AOS	Case (Interviews)	2 US and 2 Taiwanese manufacturing organizations/ 29 managers	Individual/ Organizational and Environmental	Result (Performance targets, Evaluation period, Rewards)	Performance-based rewards Performance criteria Culture	Taiwanese firms used less long-term incentives than US firms, but no support for smaller performance-based rewards, more group-based rewards, and more subjective evaluation found.
36	O'Connor (1995) AOS	Survey (Interviews)	44 companies in Singapore/ 125 Singaporean-Chinese managers	Organizational and Environmental	Result Personnel (Budget control, Participation)	Participation in planning and evaluation Role ambiguity Superior-subordinate relations Power distance (culture)	In culture with low power distance, increased participation in budget setting associated with reduced role ambiguity and improved superior-subordinate relations.
37	Otley and Pierce (1995)/ AOS	Survey	3 audit firms in Ireland/ 257 audit seniors	Individual/ Organizational and Environmental	Result and Personnel (Performance measures, Goal congruence)	Audit quality reduction Underreported time Environmental uncertainty Leadership style	Leadership style characterized by high (low) structure and low (high) consideration related to highest (lowest) level of dysfunctional behaviours. Relationships moderated by uncertainty.

38	Ross (1995)/ MAR	Survey	18 Australian manufacturing and service companies/ 215 responsibility centre managers	Individual/ Environmental	Result (Performance evaluation criteria, Budget control)	Budget emphasis Environmental uncertainty Job-related tension	Under high-uncertainty conditions, budget-constrained evaluation style related to low job-related tension. Under low-uncertainty conditions, job- related tension not affected by evaluation style.
39	Abernethy and Brownell (1997)/ AOS	Survey (Interviews)	127 R&D directors in Australian and US manufacturing and scientific organizations	Unit/ Organizational and Environmental	Result Action Personnel (Financial control, Rules and Procedures, Professional control)	Task uncertainty Accounting controls Behaviour controls Personnel controls Performance	Under high task uncertainty, reliance on personnel controls associated positively with significantly higher performance than reliance on accounting controls or behaviour controls.
40	Choo and Tan (1997)/ BRIA	Survey	10 companies/ 110 managers	Individual/ Organizational	Result (Performance evaluation criteria, Budget control)	Budgetary performance evaluation style Job-related tension Job satisfaction Performance	Both job-related tension and job satisfaction mediate the relationship between disagreement in (superior's perceived and subordinate's preferred) evaluation style and performance.
41	Waterhouse and Svendsen (1998)/ Research report	Survey and Case	114 CEOs and board members in Canadian corporations	Organizational/ Organizational	Result (Performance measures)	Strategy Performance measures	Some fit between performance measures and strategic priorities in operations and environmental issues but need for them in innovation and external reporting.
42	Abernethy and Brownell (1999) AOS	Survey	63 CEOs in Australian hospital	Organizational/ Organizational	Result (Budget control, Strategic alignment, Use of control information)	Strategic change Style of budget use Performance	Interactive budget use can mitigate disruptive performance effects of strategic change.
43	Chow, Shields, and Wu (1999)/ AOS	Survey	6 Japanese, 6 US and 6 Taiwanese manufacturing organizations located in Taiwan/ 159 managers	Organizational/ Organizational and Environmental	Result and Personnel (Performance targets, Participation, Budget control, Rewards)	Structure Participative budgeting Standard tightness Performance-based reward Culture	Taiwanese national culture important determinant of controls by Japanese and US firms operating in Taiwan. Foreign firms adjusted controls to be similar to host country controls and employee preferences.
44	Scott and Tiessen (1999)/ AOS	Survey	12 nonprofit, 15 profit-oriented organizations/ 248 managers	Unit/ Organizational	Result and Personnel (Performance targets, Participation, Rewards)	Participation in target setting Complexity Time spent in teams Compensation Team performance	Team performance associated with variety of financial and nonfinancial performance measures and further enhanced by participation in target setting and greater weight on team performance in compensation.

45	Bouwens and Abernethy (2000)/ AOS	Survey	85 business units, in Netherlands/ 170 business unit production, and sales managers	Unit/ Organizational	Result (Financial control)	Customization Interdependence MAS use	Customization affects MAS via interdependence.
46	Davila (2000)/ AOS	Case (Interviews)	12 business units in 7 European and US companies/ 5-6 managers in each unit	Unit/ Organizational and Environmental	Result (Financial control, Performance measures)	MCS characteristics Uncertainty Product strategy Organizational structure Project plan Project performance	Nonfinancial performance measures used more than financial measures. Uncertainty and strategy related to some MCS characteristics. Cross-functional integration and use of some MCS information related to performance.
47	Groot and Merchant (2000)/ AOS	Theory and Case (Interviews)	3 international joint ventures/ ? managers and partners	Organizational/ Organizational	Result, Action, and Personnel (Performance measures, Control tightness)	Control mechanisms Control focus Control tightness Strategy Trust Performance	Some similarities and differences in dispute-settling mechanisms, control focus, and control tightness. Causal model proposed.
48	Hoque and James (2000)/ JMAR	Survey	188 Australian manufacturing companies/ 66 chief financial controllers	Organizational/ Organizational and Environmental	Result (Performance measures, Use of BSC)	Balanced scorecard usage Organizational size Product life-cycle Market position Organizational performance	Larger companies make greater use of BSC. Higher the proportion of new products, greater the use of measures related to new products. Greater use of BSC associated with improved performance.
49	Otley and Pollanen (2000)/ AOS	Survey	16 public universities and colleges/ 127 administrators	Individual/ Organizational and Environmental	Result and Personnel (Performance evaluation criteria, Budget control, Participation)	Budgetary criteria Budget participation Task uncertainty Job-related tension Job satisfaction Performance	High-low and low-high combinations of budget participation and budget emphasis related to high performance. Moderating effect of task uncertainty not supported.
50	Shields, Deng, and Kato (2000)/ AOS	Survey	Automotive division of global Japanese company/ 358 senior executives	Individual/ Organizational	Result and Personnel (Performance targets, Participation, Rewards)	Participative standard setting Standard tightness Standard-based incentives Job-related stress Job performance	Standard-based incentives and standard tightness influenced by participation in standard setting. These three control system components indirectly related to job performance through job-related stress as intervening variable.

51	Van der Stede (2000)/MAR	Survey	37 diversified companies in Belgium/153 business unit managers	Unit/ Organizational	Result (Budget control, Goal congruence, Evaluation period)	Budget control style Budgetary slack Strategy Time-orientation Unit performance	Units with differentiation strategy, and more profitable units, subject to less rigid budget controls and higher budgetary slack. Slack may be beneficial for long-term thinking.
52	Abernethy and Lillis (2001)/JMAR	Survey	56 CEOs and medical directors in Australian hospitals	Organizational/ Organizational	Result (Performance measures, Strategic alignment)	Performance measurement system Service innovation Structure Organizational outcomes	Significant interdependencies among strategic choice, structure, and performance measurement systems design. Performance enhanced when these elements complement each other.
53	Malina and Selto (2001)/JMAR	Case (Interviews)	31 distributors for US Fortune 500 company/ 2 designers, 3 evaluators, 9 distributors	Organizational/ Organizational	Result (Performance measures, Strategic alignment, Goal congruence)	Balanced scorecard Strategy Motivation Tension Communication Outcomes	BSC effective for controlling strategy, but tension between top and middle management about its use as communication, control, and evaluation tool.
54	Moore and Yuen (2001)/AOS	Survey and Case	49 CEOs in manufacturing companies (survey)/ 10 firms (interviews)	Organizational/ Organizational	Result (Financial control, Reporting)	MAS characteristics Organizational life cycle Strategy Structure Leadership style Decision-making style	MAS formality changed to complement organizational characteristics across life-cycle stages. Increased formality in growth firms.
55	Fullerton and McWatters (2002)/AOS	Survey	253 executives in US manufacturing companies	Organizational/ Organizational	Result (Performance measures, Reporting, Rewards)	Performance measurement and incentive systems Organizational structure Size Innovation strategy JIT implementation	Performance measures of and incentives for quality, as well as, employee empowerment, related to the degree of JIT implementation.
56	Lillis (2002)/AOS	Case (Interviews)	36 profit centre managers	Unit/ Organizational	Result (Performance measures)	Strategy Financial measures Nonfinancial measures Profit centre outcomes	When measures conflicting, strategy implementation facilitated by looser controls and multiple measures. Emphasis on both efficiency and quality positive, but emphasis on both efficiency and customer responsiveness problematic.

57	Webb (2002)/ AOS	Laboratory experiment	90 undergraduate business students	Individual/ Organizational	Result (Budget control, Monitoring)	Reputation Variance investigation Budget slack	Possessing reputation for budget accuracy, and to lesser degree variance investigation, associated with lower budget slack.
58	Baines and Langfield- Smith (2003)/ AOS	Survey	141 managers in Australian manufacturing companies	Organizational/ Organizational and Environmental	Result (Performance measures)	Strategy Competition Organizational design Technology Advanced management accounting practices Nonfinancial information Performance	Increasingly competitive environment increased focus on differentiated strategies, which influenced changes in organizational design, advanced technology, and advanced management accounting practices. These changes led to greater reliance on nonfinancial information.
59	Ittner, Larcker and Randall (2003)/ AOS	Survey	140 senior executives in financial services companies	Organizational/ Organizational	Result (Performance measures, Strategic alignment)	Strategy Value drivers PM practices Financial measures Nonfinancial measures Performance	More extensive use of broad set of financial and particularly nonfinancial measures associated with greater measurement systems satisfaction and higher stock returns.
60	Bisbe and Otley (2004)/ AOS	Survey	58 CEOs in Spanish manufacturing company	Organizational/ Organizational	Result (Use of MCS information)	Innovation Interactive use of MCS Performance	Interactive use of MCS promotes product innovation only in low- innovation firms, whereas it hinders innovation in high-innovation firms.
61	Jermias and Gani (2004)/ MAR	Survey and Case (Interviews)	26 manufacturing companies in Jakarta/ 106 general managers, controllers, and management accountants	Unit/ Organizational	Result and Action (Performance measures, Strategic alignment, Use of control information)	Competitive strategy Organizational structure Type of control Management accounting systems Contingent fit Business unit effectiveness	Contingent fit positively related to business unit effectiveness regardless of strategy. Both product- differentiation- units and low-cost units use both output controls and behavioural controls, but the former use them more intensively than the latter.
62	Chenhall (2005)/ AOS	Survey	80 managers in Australian manufacturing companies	Unit/ Organizational	Result (Performance measures, Strategic alignment)	Integrative SPMS Strategic manufacturing alignment Organizational learning Competitive strategic outcomes	Proposes indirect effect of integrative SPMS on strategic outcomes through mediating effects of strategic manufacturing alignment and organizational learning.

63	Gerdin (2005)/ AOS	Survey	132 production managers in manufacturing companies in Sweden	Organizational/ Organizational	Result (Financial control, Reporting)	Departmental interdependence Organizational structure Management accounting systems	Support for combined effect of interdependence and structure on MAS design. Under sequential interdependence, broad-scope MAS overrepresented in lateral units. Proportion of rudimentary MAS higher among simple units.
64	Marginson and Ogdin (2005)/ AOS	Survey	221 managers from different functional areas of UK communications company	Individual/ Organizational	Result and Personnel (Budget control)	Budget commitment Empowerment Role ambiguity Leadership style Superior's expectations Occupational socialization Performance	Budget commitment can offer structure and certainty under high uncertainty and counter the effects of leaderships style, superior expectations, occupational socialization, as well as, the absence of formal accountability, financial inducements, and participation in budget setting,
65	Henri (2006)/ AOS	Survey	383 senior managers in Canadian manufacturing companies	Unit/ Organizational and Environmental	Result (Performance measures, Strategic alignment, Use of control information)	Organizational culture PMS systems Diversity of measurement Size Strategy Environmental uncertainty	Senior management teams use performance measures and PMS systems for focusing organizational attention, supporting strategic decisions, and legitimizing actions more in firms with flexibility dominant culture than in firms with control dominant culture.

^aThe source of studies is as follows:

AJM (Australian Journal of Management)	1
AOS (Accounting, Organizations and Society)	42
AR (The Accounting Review)	5
BJM (British Journal of Management)	1
BRIA (Behavioral Research in Accounting)	1
JAR (Journal of Accounting Research)	8
JMAR (Journal of Management Accounting Research)	3
MAR (Management Accounting Research)	3
Other	<u>1</u>
Total	<u>65</u>

^bManagement controls have been classified using Merchant's (1985b, 1998) typology into result, action, and personnel (including cultural) controls. The types of control system characteristics studied are included in the parentheses. Performance evaluation criteria refer to different criteria (mostly budget-based) used in (managerial) performance evaluation. The evaluation period refers to the short-term vs long-term focus.

Notes

¹ Chenhall (2003) noted that the terms management accounting (MA), management accounting systems (MAS), organizational control (OC), and management control systems (MCS) have sometimes been used interchangeably, complicating the interpretation of research findings. He defined MA as specific management accounting practices, MAS as systematic use of MA to achieve some goals, OC as the use of process control techniques, and MCS as the use of MAS, OC, and other controls, such as personal and social controls.

² Critical theorists have questioned the separability of management controls from political and social influences, the validity of organizational goals, and the ability to purposely design effective control systems, e.g., Lowe & Machin, (1983), Chua et al. (1989), and Lowe & Chua (1983).

³ However, Berry, Broadbent, and Otley (1995) noted that these relationships in reality are more complex, as organizational factors, such as structure and systems, and many environmental factors, such as laws and regulations, can be fundamentally affected by individual and societal values and ethics.

⁴ The unit level also includes responsibility centre, team, and project structures used in a few studies.

⁵ Although several studies have used this approach (e.g., Bruns & Waterhouse, 1975; Waterhouse & Svendsen, 1998; Moores & Yuen, 2001; Fullerton & McWatters, 2002), Chenhall (2003) questioned the validity of inferences to outcomes from such studies.

⁶ The journals, from which the studies are drawn, are: *Accounting Organizations and Society*, *The Accounting Review*, *Journal of Accounting Research*, *Behavioral Accounting Research*, *Journal of Management Accounting Research*, *Management Accounting Research*, *Australian Journal of Management*, and *British Journal of Management*.

⁷ A comprehensive review of this literature is available, e.g., in Briers and Hirst (1990) and Hartmann (2000).

⁸ Stogdill (1963) identified two dimensions of leadership behaviour: consideration, i.e., concern with trust, respect, and subordinates' ideas, and feelings; and structure initiation, i.e., concern with clear and detailed responsibilities, communication channels, and procedures.

⁹ However, some optimism exists in that this situation may be slowly changing due to recent initiatives by public organizations to adopt a wider range of management tools, such as accrual accounting. For example, a significant number of senior Canadian governments use, or planning to use, the accrual accounting basis for their planning, budgeting, and reporting documents ((The) Canadian Institute of Chartered Accountants, 2004, xiii).

¹⁰ The categorization of technology as an environmental factor, as opposed to an organizational factor, is subject to some debate. Although existing technology in organizations constitutes an organizational factor, in accordance with Waterhouse and Tiessen (1978), new technology normally initiates outside organizations, unless the organization in question is a leading technology company involved in developing that technology. Therefore, for the purposes of this review, technology is classified as an environmental factor.

¹¹ Hofstede's (1980, 1997) cultural dimensions are as follows: masculinity/femininity (concern with gender roles, quality of life, material success, modesty, and nurturing); individualism/collectivism (concern with own and immediate family members', rather than extended group members', welfare); uncertainty avoidance (perception of threat from uncertain or unknown situations); power distance (acceptance of unequal power distribution); and Confucian dynamism (concern with short- and long-term orientation).

¹² Hopwood (1974a) classified controls as administrative, social, and self-controls; Ouchi (1977) as behaviour and output controls; Hofstede (1981) as routine, expert, trial-and-error, intuitive, judgmental, and political controls; Whitley (1999) as bureaucratic, output, delegated, and patriarchal controls; and Simons (1995, 2000) as boundary, belief, diagnostic, and interactive controls.

¹³ The control systems characteristics are classified as follows: performance evaluation criteria, performance measures, performance targets, participation, budget control, financial control, rules and procedures, professional control, evaluation period, use of control information, control tightness, monitoring, reporting, goal congruence, strategic alignment, and rewards. These categories are consistent with the management control literature, but they are not necessarily mutually exclusive or exhaustive. For example, as performance evaluation criteria, particularly budget-based criteria, have commonly been studied, they constitute a separate category instead of being treated as part of more general budget control. Similarly, budget control and other financial controls are treated as separate categories. Nonetheless, the categories chosen demonstrate the major areas of focus in management control systems research.

¹⁴ In general, this literature provides some evidence that employees perform better under specific targets than vague targets and that, for optimum motivation, targets should be challenging but achievable by well-trained and motivated employees, although Merchant (1990a) and Merchant and Manzoni (1989) promoted highly achievable standards, supplemented with other incentives.

¹⁵ Although there are some other recent studies on the use of performance measures in executive compensation (e.g., Dilla & Steinbart, 2005; Roberts, Albright, & Hibbets, 2004; Ittner, Larcker, & Meyer, 2003; Lipe & Salterio, 2000), they are beyond the scope of this study, as they do not explicitly consider the organizational or environmental context or outcomes of performance measurement.

¹⁶ Otley (1980) identified the necessary conditions of control as follows: clear objectives, controllable and measurable outputs, a predictive model for determining the causes of discrepancies, and an ability to take corrective actions. Furthermore, he warned that serious deficiencies in meeting all four conditions, compounded by flaws in control design, implementation, and use, may result in goal incongruence and lead to dysfunctional behaviours and suboptimal decisions.

