

# Integrative contingency-based framework of MCS: the case of post-secondary education

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## Abstract

**Purpose** – The purpose of this paper is to explore whether and how changes in the management control systems (MCS) of post-secondary institutions (PSIs) in Western Canada can be described and explained in terms of formal and informal MCS; and whether and how changes in the MCS of PSIs in Western Canada can be described and explained in terms of an integrative contingency-based framework of MCS based on regulatory accountability systems, competitive markets and organizational culture?

**Design/methodology/approach** – The empirical research was undertaken with an exploratory mixed design. The first phase involved descriptive univariate and bivariate statistics as well as non-parametric statistics computed on data from annual reports and financial statements of 46 PSIs in Western Canada to quantitatively explore MCS. The second phase involved the grounded theory (GT) analysis of annual reports of 46 PSIs in Western Canada to qualitatively explore formal MCS in relation to changes in contingencies. The third phase involved the GT analysis of 20 semi-structured interviews of senior managers from PSIs in Western Canada to qualitatively explore informal MCS in relation to formal MCS and changes in contingencies.

**Findings** – The research showed that emphasis on formal MCS in Western Canadian PSIs resulted in biased compliance within informal MCS. The exploratory research also demonstrated that the distinction between formal and informal MCS was better understood in a wider framing of MCS in terms of regulatory accountability systems, competitive markets and organizational culture.

**Originality/value** – This research led to the elaboration of an exploratory theoretical framework to subsume the distinction between formal and informal MCS into an integrative contingency-based framework of MCS.

**Keywords** Management control systems, Case study, Post-secondary education, Contingencies, MCS

**Paper type** Research paper

## 1. Introduction

There have been considerable changes in the post-secondary education sector affecting the Roles & Mandates of institutions and accountability to the government and the community (Broadbent *et al.*, 1997, 2010; Meek *et al.*, 2010). The research reported here

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examines, within the accountability system of Western Canadian post-secondary institutions (PSIs), the interrelationships existing between formal and informal management control systems (MCS) and changes in the external and internal strategic environment of Western Canadian PSIs (i.e. contingencies). As such, this article focuses on a contingency-based MCS research with formal and informal processes taking place in the context of a principal–agent regulatory accountability system.

Here, Western Canada refers to the provinces of Alberta and British Columbia (BC), because Alberta and BC have Memorandums of Agreements (Alberta BC Memorandums, 2007) aiming at offering comparable regulatory accountability systems. PSIs refer to all non-profit and publicly funded academies, universities, colleges and other collegiate-level institutions that award academic degrees, diplomas and/or professional certifications in Alberta and BC. In the context of Western Canadian PSIs, control is exercised over authority delegated to institutions by the government and the community (i.e. principal–agent regulatory accountability system) (Hayne and Free, 2014; Broadbent *et al.*, 2010). Such principal–agent regulatory accountability systems have been viewed as the establishment of MCS by the principal (i.e. the government) to supervise strategic, financial and behavioural metrics; measure the quantity and quality of inputs, processes and outputs; and correct strategic, financial and behavioural deviations of the agent (i.e. the PSI) (Malni and Brown, 2008; Portnoff, 2007; Spekle, 2001). Such regulatory accountability systems require strategic plans, implementation plans and associated projections to monitor progress towards their accomplishment (Malni and Brown, 2008; Portnoff, 2007; Berry *et al.*, 2005). Agents are not passive in the process of applying MCS, instead agents respond to pressures from the principal by interpreting, translating and adapting MCS to their specific contingencies (Strauss *et al.*, 2013).

The research presented in this article showed that an emphasis on formal MCS by the principal resulted in biased compliance within informal MCS by the agent. The research also showed that formal MCS could be described and explained in terms of regulatory accountability systems, competitive markets and organizational culture. Therefore, the research added to the MCS literature and particularly to the emerging strand that focuses on the integrative nature of MCS (Cooper *et al.*, 2014; Strauss *et al.*, 2013; Malmi and Brown, 2008; Chenhall, 2003; Flamholtz *et al.*, 1985; Otley, 1980).

This article is organized as follows. Section 2 provides an overview of interrelationships between MCS and changes in the external and internal strategic environment (i.e. contingencies) with its application in PSIs. Section 3 introduces the research questions and Section 4 the research methodology. The findings are presented in Section 5. The article ends with discussion and conclusions.

## 2. Contingency-based management control system research

### 2.1 Management control system research

Mechanistic conceptions of MCS depict MCS as explicit formal procedures and tools that lead to effectiveness and efficiency (Cooper *et al.*, 2014). In this context, the terms Management Accounting (MA), Management Accounting Systems (MAS), Organizational Controls (OC) and Management Control Systems (MCS) have long been used interchangeably (Carenys, 2012; Chenhall, 2003; Otley, 1999). As such, MCS were first operationalized as purely formal and routine accounting procedures and tools assisting managerial decisions (Chapman, 1997).

The definition of MCS has then evolved from focusing on formal, routine and financially quantifiable information, to embracing a broader scope of accounting information (e.g. regulatory accountability systems, markets, customers, competitors and production processes) (Chenhall, 2003). It was argued, more broadly, that MCS involved aligning strategic stances, implementation plans and monitoring progress towards their accomplishment within a specific accountability system (Carenys, 2012; Chenhall, 2003; Otley, 1999). Anthony and Govindarajan (2007) defined MCS as the procedures and tools by which senior managers influenced other members of the organization to implement the organization's strategy and steer the organization towards its strategic objectives. More specifically, MCS guide organizations into viable patterns of activity in a changing external and internal strategic environment (i.e. contingencies) to align strategy implementation with pre-determined targets within a specific regulatory accountability system (Berry *et al.*, 2009; Malni and Brown, 2008; Berry *et al.*, 2005; Chenhall, 2003; Spekle, 2001; Simons, 1995; Otley and Berry, 1980). Even here the language of finance is necessary for financial forecasts, budgeting and auditing systems, as they establish intended inputs and outputs and monitor actual inputs and outputs with associated yearly reports (e.g. annual reports, accountability reports, consolidated statements of financial position, consolidated statements of operations, changes in net assets and cash flow and auditor's reports) (Malni and Brown, 2008; Berry *et al.*, 2005).

A distinction between formal and informal MCS was thus introduced (Anthony and Govindarajan, 2007; Berry *et al.*, 2005). First, formal MCS were described as promoting clearly stated objectives and decision processes associated to quantitative measures of performance. Formal MCS were deliberately designed to include governmental rules, regulations, educational policies, standard operating procedures, manuals and accounting and budgeting systems (Anthony and Govindarajan, 2007; Berry *et al.*, 2005). Second, informal MCS were described as promoting vague objectives and decisions processes associated to ill-defined qualitative measures of performance or deviations in the implementation and reporting of quantitative measures. Informal MCS were not designed and included work ethics, management style and organizational culture (Anthony and Govindarajan, 2007; Berry *et al.*, 2005). Both types of MCS were believed to influence and be influenced by senior managers and employees' behaviours (Berry *et al.*, 2009).

Although MCS are one of the most intensively investigated strand of the management accounting literature (Strauss *et al.*, 2013; Merchant and Otley, 2007; Chenhall, 2003), research has mainly focused on the analysis of single components of MCS (e.g. budgets, strategic milestones or performance metrics) in isolation from their contingencies (Strauss *et al.*, 2013; Malni and Brown, 2008; Chenhall, 2003). However, single components of MCS do not act independently and in isolation of their contingencies. They are parts of an integrative system which encompasses not only formal/quantitative MCS but also informal/qualitative MCS (Cooper *et al.*, 2014; Malni and Brown, 2008; Chenhall, 2003; Flamholtz *et al.*, 1985; Otley, 1980). Accordingly, it is important to explore whether and how organizations strategically align (i.e. balance) different components of MCS (i.e. interrelationships between formal and informal MCS) in line with their external and internal strategic environment (i.e. contingencies) such that they are effective and efficient (Mundy, 2010).

## 2.2 Contingency-based research

Contingency-based research focused on generic and/or specific definitions of the external and internal strategic environment of organizations (Carenys, 2012; Chenhall, 2003). First, specific definitions referred to contingencies such as uncertainty, technology, size, structure, strategy and/or national culture (Chenhall, 2003). Second, generic definitions attempted to capture the effects of specific contingencies in a more generalized way with taxonomies of external and internal strategic environments (Chenhall, 2003). Contingency-based research also focused on describing and explaining effectiveness and efficiency of MCS depending on the external and internal strategic environment (Carenys, 2012; Chenhall, 2003; Chapman, 1997).

Whilst the external environment is at the foundation of contingency-based research (Chenhall, 2003), perhaps the most widely researched aspect of the external environment is uncertainty (Chenhall, 2003; Chapman, 1997). Uncertainty resulting from changes in contingencies has been shown to impact the way organizations approached MCS (Cooper *et al.*, 2014; Chenhall, 2003; Chapman, 1997). Main conceptions of contingencies suggest that no MCS is ideal for all organizations, but instead the fit of explicit formal tools depends on the circumstances in which the organization finds itself (Cooper *et al.*, 2014). First, a mechanistic organization was seen as a suitable response to a stable environment that required differentiation of accounting information (Cooper *et al.*, 2014; Chapman, 1997). Mechanistic MCS relied on formal rules, standardized operating procedures and routines (i.e. formal MCS). Second, an organic organization was seen as a suitable response to an unstable environment where pre-planning was impossible, and where a hierarchical structure of MCS was not effective and efficient because of the level of changes required (Cooper *et al.*, 2014; Chapman, 1997). If activity was not planned in advance or did need to be adjusted as organizational change unfolded, flexible processes that required customization of accounting information (i.e. informal MCS) were more effective and efficient (Cooper *et al.*, 2014; Chapman, 1997). Third, an integrative framework of mechanistic MCS (i.e. for differentiation of accounting information) and organic MCS (i.e. for customization of accounting information) may be considered effective and efficient to manage uncertainty in most environments (Ogata and Spraakman, 2013), as most contingencies are neither at the stable nor at the unstable end of the continuum. Such an integrative conception would depict MCS as explicit and implicit, formal and informal, quantitative and qualitative accounting frameworks that bring effectiveness and efficiency to an organization in a changing external and internal strategic environment (Cooper *et al.*, 2014; Strauss *et al.*, 2013; Malmi and Brown, 2008; Chenhall, 2003; Flamholtz *et al.*, 1985; Otley, 1980).

The internal environment may also affect MCS (Chenhall, 2003). When evaluating contingency interrelationships between MCS and structure, elements of strategy are likely to be implicated (Chenhall, 2003; Otley, 1980). Strategy is somewhat different from other contingency variables. In a sense, it is not an element of the context, rather it is the means whereby senior managers influence the nature of the structural arrangements related to regulatory accountability systems, competitive markets and organizational culture (Chenhall, 2003). This focus on elements of strategy addressed the criticism that contingency-based research depicted senior managers as captured by their MCS, as it recognized that senior managers could make strategic choices (Chenhall, 2003; Otley,

1980). Indeed, changes in contingencies have been shown to impact the way senior managers made strategic choices to rely more or less on rule-based, market-based or culture-based MCS and seek for compliance as well as strategic alignment of their organization (Batool, 2011; Cameron and Quinn, 2006; Bakar and Berry, 1993; Lebas and Weigenstein, 1986). First, rule-based MCS relied on controlling functional operations of the organization through procedures and bureaucratic arrangements (i.e. accounting standards of control) (Cooper *et al.*, 2014; Batool, 2011; Bakar and Berry, 1993) and were:

- associated with evaluations to ensure that correct procedures were followed;
- concerned with maintaining the existing social order as determined by hierarchies; and
- relied on the use of accounting and performance systems, data or reports to evaluate performances in line with policies (Batool, 2011; Bakar and Berry, 1993; Lebas and Weigenstein, 1986).

Second, market-based MCS relied on determining how resources were related to turnarounds and the bottom line (Batool, 2011; Bakar and Berry, 1993; Lebas and Weigenstein, 1986). Rule-based and market-based MCS both relied on financial information, often claimed as quantitative objective information. However, this could be misleading because information is costly, human cognition is limited and senior managers can have biased preferences that motivate their choices and understanding of non-financial and financial metrics (Cooper *et al.*, 2014; Malni and Brown, 2008; Kadous *et al.*, 2003; Bakar and Berry, 1993). Third, culture-based MCS relied on psychosocial and cultural factors, as an important element of control of employees' behaviours (Cooper *et al.*, 2014; Batool, 2011; Cameron and Quinn, 2006; Bakar and Berry, 1993; Lebas and Weigenstein, 1986). Ouchi (1980), following Williamson's (1991) consideration of hierarchies and markets, proposed a model that organizations can rely on patterns of socialization as their primary control mechanism (i.e. democratic standards of control). In such culture-based MCS, control was linked to the core belief that members of an organization hold (i.e. a common system of meanings which shapes organizational behaviour). Indeed, culture can be described as the norms, values and symbols which enable members of an organization to do their job efficiently and effectively (Batool, 2011; Bakar and Berry, 1993).

Hence, following Ouchi (1980), it was suggested that MCS may be exercised as either types of MCS based upon regulatory accountability systems, competitive markets and organizational culture, or as an eclectic mix of these MCS (Bakar and Berry, 1993). This conception of MCS is the basis of the research presented in this article.

### *2.3 Management control system in post-secondary institutions*

Changes in Western Canadian government policy towards PSIs were related to an increased pressure for accountability in terms of effectiveness and efficiency, amplified by the recent economic downturns (Glass *et al.*, 2009; Gordon and Fisher, 2008; Broadbent, 2007). In response, many of the Western Canadian PSIs were in the process of developing more systematic, specialized, professionalized and institutionalized performance metrics (Bouckaert and Halligna, 2006).

It has been reported that regulatory accountability systems in PSIs leaned towards decreased levels of funding from the government and increased levels of commercialization or privatization (Broadbent and Laughlin, 2005; Deem and Brehony,



2005). Many PSIs had no choice but to reduce the number of available courses or research programmes in areas associated with little financial return, and use data-driven programmes prioritization strategies to review which programmes merited support on the basis of operating grant per student measures, demographic changes measures and/or governmental priorities (Deem and Brehony, 2005; Washburn, 2005). In terms of competitive markets of PSIs, it has been reported that past and current trends leaned towards an increased level of competition between institutions and the need to find new market opportunities with wider nets targeted at the recruitment of students outside the traditional area of focus (i.e. local to provincial, national and international) and new teaching models to reach out to this wider net of students (i.e. blended and online learning) and to reduce operating costs (Fried and Hill, 2009; Lerner *et al.*, 2008). In terms of organizational culture in PSIs, it has been found that past and current trends leaned towards an increased level of hiring of senior managers from within the ranks of the private sector (Cameron and Quinn, 2006; Kezar *et al.*, 2006). Presidents-CEOs of publicly funded PSIs were placing less value on the intellectual and non-commercial tradition of their institution than on the financially lucrative programmes and research synchronized to the needs of the business community (Deem and Brehony, 2005; Amaral *et al.*, 2003). The consequence of this culture shift of PSIs was a tension between those who encouraged the new entrepreneurial and managerial spirit of PSIs and those who perceived the collaboration between PSIs and the private sector as weakening academic freedom and the very nature of PSIs as social enterprises (Meek *et al.*, 2010; Broadbent *et al.*, 1997).

PSIs are managed by agents (i.e. board of governors and senior managers) who are responsible for acting on behalf of the principals (e.g. governments) (Hayne and Free, 2014; Broadbent *et al.*, 2010). Governments have produced for the respective institutions specific Roles & Mandates and Letters of Expectation (i.e. regulative edicts of educational policies) and then have delegated authority to PSIs to implement Letters of Expectations as per Roles & Mandates. These regulative edicts for PSIs have been described as institutional steering media (Broadbent *et al.*, 2010). However, these regulative edicts are also environmental disturbances to the PSI's own regulations (Broadbent *et al.*, 2010). These regulative edicts are sources of uncertainty in the external and internal strategic environment of Western Canadian PSIs. Consequently, the separation between the notion of principal and agent may result in what has been termed an agency dilemma arising from misalignment (i.e. lack of balance) between formal (i.e. stated) and informal (i.e. enacted) MCS (Mundy, 2010). For while a principal delegates authority to an agent, an agent may comply at the level of the stated formal MCS in a way that may not wholly align with the principal's interest, but serve an agent's interest (i.e. there may be biased compliance at the level of the enacted informal MCS) (Mundy, 2010). Indeed, agents may respond to pressures from the principal by interpreting, translating and adapting MCS to their contingencies (Strauss *et al.*, 2013) because of information asymmetry and self-serving motivations (Hayne and Free, 2014; Broadbent *et al.*, 2010). First, information asymmetry comes from the fact that institutional information is in the hands of the PSIs as agent, which may result in differences between the strategy as formally stated and the strategy as informally enacted (Hayne and Free, 2014; Broadbent *et al.*, 2010). Second, self-serving motivation comes from the fact that PSIs are not interacting with the government; regulatory accountability systems are set-up for them, which may result in a misunderstanding of

the rationale for the imposed systems (i.e. arbitrary regulation or colonization) (Oakes and Berry, 2009). Perceived arbitrary regulation or perceived colonization may result in instrumental obedience (i.e. obedience within formal stated MCS without any actual change of schemes and behaviours within informal enacted MCS and/or in biased compliance) (Oakes and Berry, 2009).

The potential existence of an agency dilemma with formal and informal MCS in Western Canada PSIs suggests that an empirical investigation could lead to the elaboration of an exploratory contingency theoretical framework combining formal and informal MCS in relation to changes in the external and internal strategic environment into an integrated accountability system (Hayne and Free, 2014; Cooper *et al.*, 2014). That enquiry was the research focus underpinning this article.

### 3. Research questions

In the context of Western Canadian PSIs, MCS involved aligning strategic stances (i.e. Roles & Mandates), implementation plans (i.e. teaching and research programmes) and monitoring progress (i.e. effectiveness and efficiency metrics) towards the accomplishment of strategic plans (Berry *et al.*, 2005).

The literature review notes how consideration of MCS began with somewhat mechanistic definitions which were extended to include strategic considerations, then further broadened following Williamson (1991) and Ouchi's (1980) work in the context of three ideal types of formal and informal MCS based upon:

- (1) regulatory accountability systems;
- (2) competitive markets; and
- (3) organizational culture.

In one sense, the idea of an informal MCS may be a means of handling the uncertainties extant in any organization subject to MCS. Informal MCS may also be a means for organization participants to mediate differing cognitions and values, ambiguity and complexity, in the process of aligning an organization to changes in the external and internal strategic environment (i.e. contingencies). The literature review also showed the importance of the themes of changes in the external and internal strategic environments of PSIs on dimensions related to regulatory accounting rules, competitive markets and organizational culture.

Although the idea of studying MCS as an integrative system has been in the field for some time (Cooper *et al.*, 2014; Strauss *et al.*, 2013; Malmi and Brown, 2008; Chenhall, 2003; Flamholtz *et al.*, 1985; Otley, 1980), only a few studies have been conducted to explore integrative MCS within a contingency-based approach (Strauss *et al.*, 2013; Malmi and Brown, 2008; Bakar and Berry, 1993). Prior research has mainly investigated the formal parts of MCS, such as regulatory accountability systems, or focused on single parts of the MCS in isolation of their contingencies (Strauss *et al.*, 2013; Chenhall, 2003).

From observations of changes in the PSIs in Western Canada and considerations drawn from the MCS literature, it was conjectured that an integrative contingency-based framework of MCS for Western Canadian PSIs might improve our understanding of how MCS were being conducted in a changing environment (Cooper *et al.*, 2014; Malmi and Brown, 2008; Chenhall, 2003; Flamholtz *et al.*, 1985; Otley, 1980). Such an integrative contingency-based framework of MCS would include both formal and informal MCS, with

regulatory accountability systems, competitive markets as well as organizational culture (i.e. psychosocial and cultural factors) as key variables (Cooper *et al.*, 2014; Carenys, 2012).

The research questions were formulated as:

*RQ1.* Whether and how changes in the MCS of PSIs in Western Canada could be described and explained in terms of formal and informal MCS?

*RQ2.* Whether and how changes in the MCS of PSIs in Western Canada could be described and explained in terms of regulatory accountability systems, competitive markets and organizational culture?

#### 4. Research methodology

Prior research has mainly investigated the formal parts of MCS, such as regulatory accountability systems, or focused on single parts of the MCS in isolation of their contingencies (Strauss *et al.*, 2013; Chenhall, 2003). Some argued that there was a need for more qualitative and quantitative research within contemporary settings to ensure that contingency-based MCS research was still relevant (Chenhall, 2003; Chapman, 1997). First, it was necessary to qualitatively and quantitatively study, within contemporary settings, whether integrative MCS practices provided a hybrid of:

- tight, formal, objective and stated MCS; and
- open, informal, subjective and enacted MCS (Chenhall, 2003; Chapman, 1997).

Second, it was necessary to qualitatively and quantitatively study, within contemporary settings, how these integrative MCS practices were aligned or balanced with their contingencies in terms of regulatory accountability systems, competitive markets and organizational culture (Chenhall, 2003). This study builds on previous research in this field with an exploratory case study using both quantitative and qualitative methods (Chenhall, 2003; Chapman, 1997).

##### 4.1 Relativist approach

In the context of a relativist exploratory approach, a grounded theory (GT) methodology was chosen because it involves the construction of a theoretical framework through the analysis of data (Suddaby, 2006). We conjectured that a GT methodology would lead to the elaboration of a contingency theoretical framework for the domain, in that it might increase the range of description and explanation of the themes of formal and informal MCS and the integrative framework considered in the research questions.

A relativist exploratory approach in theory construction means that approaching a research without a relevant literature review is unwise, as this process often generates amounts of data that are unmanageable (Schreiber and Stern, 2001; Strauss and Corbin, 1998; Corbin and Strauss, 1990). A relativist exploratory approach in theory construction also means that the researcher plays a structuring role in developing an exploratory understanding of Western Canadian PSIs (Easterby-Smith *et al.*, 2008). As a consequence, a relativist exploratory approach uses research questions instead of hypotheses (Easterby-Smith *et al.*, 2008). A relativist exploratory approach in theory construction also means that a mixed design needs to be used to get multiple viewpoints in terms of data and analyses (Easterby-Smith *et al.*, 2008). Within a relativist



exploratory approach, the construction of an exploratory theoretical framework involves the use of secondary and/or primary data that may be analysed quantitatively and/or qualitatively (Easterby-Smith *et al.*, 2008). “All is data” in a GT context (Suddaby, 2006, pp. 633-642; Glaser and Strauss, 1967, Chapter VIII) and the heterogeneous nature of the data and analyses strengthen the credibility and the ontological or educative authenticity of the analyses.

#### 4.2 Data sources

First, MCS were accessed using PSIs’ annual reports and financial statements (i.e. secondary archival data that were publicly available online[1]). Second, MCS were accessed using semi-structured interviews (i.e. primary empirical data collected for the purpose of the research).

Qualitative and quantitative analyses mimicked each other’s process of analysis with:

- the extraction of core and subordinate themes (i.e. GT analysis) corresponding to the computation of variables (i.e. quantitative analysis); and
- the exploration of interrelationships between core and subordinate themes (i.e. GT analysis) corresponding to the exploration of interrelationships between computed variables (i.e. quantitative analysis) (Easterby-Smith *et al.*, 2008).

#### 4.3 Data collection

*4.3.1 Secondary data and population for formal management control system.* Secondary data were collected, quantitatively analysed using descriptive univariate and bivariate statistics as well as non-parametric statistics and qualitatively analysed using the GT iterative process. Secondary data were collected through institutional documents from Western Canadian PSIs and the Government of Alberta and BC. The secondary data were intended to achieve an understanding of MCS in PSIs, with PSIs’ formal description and explanation of MCS and changes in the external and internal strategic environment of the sector. The institutional documents (i.e. annual or accountability reports) used in the research included:

- mandates;
- mission, vision, values;
- programmes offered and research agreements; and
- financial statements (i.e. consolidated statements of financial position, consolidated statements of operations, changes in net assets, cash flow, notes and auditor reports).

The population for data collection was all publicly funded institutions in Western Canada (i.e. Alberta and BC), with 21 publicly funded PSIs in Alberta and 25 publicly funded PSIs in BC. These 46 publicly funded PSIs were related to three categories of Roles & Mandates:

- (1) “Baccalaureate and Applied Studies Institutions and Comprehensive Academic and Research Institutions” ( $n = 17$ );
- (2) “Comprehensive Community Institutions” ( $n = 22$ ); and

- (3) "Specialized Art and Culture Institutions and Polytechnic Institutions"  
( $n = 7$ )[1].

*4.3.2 Primary data and sample for informal management control system.* Primary data were collected and qualitatively analysed using the GT iterative process. Primary data were collected through semi-structured interviews (i.e. see [Tables IV and V](#) for details on core and subordinate themes in the semi-structured interviews) to explore the interviewees' experience, description and explanation of MCS and changes in the external and internal strategic environment of the sector. The primary data transcripts, via a GT analysis, were intended to provide an understanding of how the formal MCS operated, how the informal MCS operated and the interrelationship of the formal to the informal MCS, as well as exploring the manner in which the analysis could sustain an integrative understanding. The transcripts of the semi-structured interviews were approved by the interviewee as an accurate version of the interview.

Primary data were collected from the transcripts of semi-structured interviews conducted with actors in the domain: 11 were male and 9 female; the average age was 53.25 years, ranging from 43 to 70 years old. All interviewees were senior managers or representatives (e.g. Members of the Board of Governors, Presidents, Vice Presidents, Associate Ministers) in PSIs in Western Canada, with 7 actors from BC and 13 from Alberta[2].

Following the analysis, the insights related to the GT analyses of the transcripts were provided to nine senior managers from PSIs in Western Canada and their views and thoughts were collected via unstructured interviews[3].

#### *4.4 Data analysis*

First, a quantitative analysis of the institutional documents using descriptive univariate and bivariate statistics as well as non-parametric statistics was conducted to explore MCS in Western Canadian PSIs.

Second, a qualitative GT analysis of institutional documents and semi-structured interview transcripts was undertaken to lead to the extraction of themes and their interrelationships from secondary and primary data, and explore formal and informal MCS and changes in regulatory accountability systems, competitive markets and organizational culture.

The quantitative study was conducted to explore the core themes and interrelationships quantitatively ([Suddaby, 2006](#); [Glaser and Strauss, 1967](#)). The qualitative GT analysis allowed the researcher to qualitatively extract core themes and their interrelationships from semi-structured interviews and institutional documents ([Easterby-Smith et al., 2008](#); [Suddaby, 2006](#)).

The role of the theoretical framework was to depict core themes and interrelationships that were extracted from different data and analysis processes, and as such with a potential for generalization ([Easterby-Smith et al., 2008](#)).

*4.4.1 Quantitative analysis.* The coding/analysis took place in two stages. The first stage was related to the computing and analysis of variables based on the literature review. The second stage was related to the analysis of the interrelationships existing between the computed variables.

The analyses explored the MCS of PSIs in Western Canada, with the understanding that MCS involved aligning strategic stances (i.e. Roles & Mandates), implementation

plans (i.e. teaching and research programmes) and monitoring progress (i.e. effectiveness and efficiency metrics) towards the accomplishment of strategic plans (Berry *et al.*, 2005).

For the strategic stance in terms of Roles & Mandates of the institutions, three categories of public PSIs were considered with an ordinal variable going from 1 to 3 (i.e. 1 – “Specialized Art and Culture Institutions and Polytechnic Institutions”, 2 – “Comprehensive Community Institutions” and 3 – “Baccalaureate and Applied Studies Institutions and Comprehensive Academic and Research Institutions”) and a ranking in terms of the excellence of the PSIs (i.e. this was based on the Roles & Mandates as per Alberta Advanced Education, 2007).

For the strategy implementation in terms of the programmes offerings, six categories were considered with an ordinal variable going from 1 to 6 (i.e. 1 – “Non-Parchment Programs”; 2 – “Certificates & Diplomas, Adult High School Completion”; 3 – “Certificates & Diplomas, Adult High School Completion, Apprenticeship, Collaborative Baccalaureate Programming”; 4 – “Apprenticeship, Certificate, & Diploma Programs for Technical Vocations, some Applied & Baccalaureate Degrees in Specified Areas”; 5 – “Baccalaureate Degrees, Certificates & Diplomas, and Applied Degrees” and 6 – “Comprehensive Baccalaureate & Graduate programs”). A ranking was added in terms of the excellence of the programme offerings (i.e. as per Roles & Mandates of Alberta Advanced Education, 2007).

For the strategy implementation in terms of the research programmes, three categories of research programmes were considered with an ordinal variable going from 1 to 3 (i.e. 1 – “Applied Research”; 2 – “Applied Research and Scholarly Activity”; 3 – “Comprehensive Research Function”). To this was added a ranking in terms of excellence of the research programmes (i.e. as per Roles & Mandates of Alberta Advanced Education, 2007).

For the organizational performance of the PSIs, three quantitative/ratio-level variables were considered. First, the number of FTE/FLE students for each institution was considered as a metric for enrolments to reflect effectiveness. Second, the Canadian Dollars amount of operating grant from the government available PSIs to support teaching and learning functions was considered to reflect financial resources. This operating amount combined operating grants and Enrolment Planning Envelope funding (i.e. including international and continuing education students funding) into one metric. Students’ tuition net of scholarship amounts, research funding, ancillary fees and all other revenues were excluded. Third, the Canadian Dollars amount of operating grant per FTE/FLE students was computed and used as a measure of productivity or efficiency (Glass *et al.*, 2009).

Descriptive univariate statistics were used to quantitatively explore the variables. Descriptive bivariate statistics as well as other non-parametric statistics were used to quantitatively explore interrelationships between the variables. Spearman rank correlation coefficients and Kruskal-Wallis tests were used, as these statistical tools do not assume normality in the data and can be applied to explore the interrelationships existing between variables at an ordinal and/or ratio level.

4.4.2 *Qualitative analysis.* The relativist GT coding/analysis took place in two stages (Strauss and Corbin, 1998; Corbin and Strauss, 1990). The first stage (i.e. open coding) was an iterative process with categorizations evolving over time and allowing researchers to explore tentative themes and research questions developed from the literature review (Schreiber and Stern, 2001; Strauss and Corbin, 1998; Corbin and

Strauss, 1990). The second stage (i.e. selective and axial coding) was driven by core and subordinate themes that were re-sorted by dissecting and re-organizing interviewees' responses around key ideas and insights followed by the comparing of these findings with existing research (Schreiber and Stern, 2001; Strauss and Corbin, 1998; Corbin and Strauss, 1990)[4].

The analyses explored the MCS of PSIs in Western Canada, with the understanding that MCS involved aligning strategic stances (i.e. Roles & Mandates), implementation plans (i.e. teaching and research programmes) and monitoring progress (i.e. effectiveness and efficiency metrics) towards the accomplishment of strategic plans (Berry *et al.*, 2005).

For the strategic stance in terms of Roles & Mandates of the institutions, the GT analysis explored the discourse for the Role & Mandates for three categories of public PSIs with an ordinal variable going from 1 to 3 (i.e. 1 - "Specialized Art and Culture Institutions and Polytechnic Institutions", 2 - "Comprehensive Community Institutions" and 3 - "Baccalaureate and Applied Studies Institutions and Comprehensive Academic and Research Institutions") as per Roles & Mandates of Alberta Advanced Education (2007).

For the strategy implementation in terms of the teaching programmes, the GT analysis explored the discourse for the programmes offerings as per Roles & Mandates of Alberta Advanced Education (2007).

For the strategy implementation in terms of the research programmes, the GT analysis explored the discourse related to the research as per Roles & Mandates of Alberta Advanced Education (2007).

For the organizational performance of the PSIs, the GT analysis explored the discourse related to the disclosure of performance indicators to reflect effectiveness and efficiency (Glass *et al.*, 2009).

Given that several interviewees had similar backgrounds and experiences, some of their ideas and perspectives could be compared and confirmed against one another. As the core and subordinate themes became saturated, the researcher examined the interrelationships that allowed the themes to relate to each other using memoing and diagramming. The analysis was characterized by ongoing hypothesizing and theorizing and by continuously discarding and revising suitable theories in pursuit of the exemplary quotes that would represent the best fit between data and analysis (Hayne and Free, 2014; Easterby-Smith *et al.*, 2008; Schreiber and Stern, 2001; Strauss and Corbin, 1998; Corbin and Strauss, 1990). The exemplary quotes presented in the findings were selected to be the most representative of a core theme and subordinate theme in relation to the research questions (Hayne and Free, 2014; Easterby-Smith *et al.*, 2008; Schreiber and Stern, 2001; Strauss and Corbin, 1998; Corbin and Strauss, 1990)[5].

## 5. Findings

This section presents the findings from the institutional documents (i.e. secondary data) using some statistical analyses (i.e. descriptive univariate statistics on census data, descriptive bivariate statistics and other non-parametric statistics) and presents the findings from the institutional documents (i.e. secondary data) and semi-structured interviews (i.e. primary data) using a GT analysis (i.e. open coding, axial coding, selective coding, theoretical coding, memoing and diagramming).

The analyses explored the MCS of PSIs in Western Canada, with the understanding that MCS involved aligning strategic stances (i.e. Roles & Mandates), implementation plans (i.e. teaching and research programmes) and monitoring progress (i.e. effectiveness and efficiency metrics) towards the accomplishment of strategic plans (Berry *et al.*, 2005). The analyses also explored the functional interrelationships existing between formal and informal MCS and changes in terms of regulatory accountability systems, competitive markets and organizational culture.

### 5.1 Management control system: statistical analyses of the institutional documents

5.1.1 *Themes for management control system.* Descriptive univariate statistics on census data were used to quantitatively explore MCS in Western Canadian PSIs. In terms of the strategic stances and implementation plans, frequency data for the programmes and research strategy are presented in Tables I and II.

In terms of the monitoring plans, mean data for performance outcomes for Western Canadian PSIs were summarized as means and standard deviations with the mean for the number of FTE/FLE students ( $M = 7,095.33$ ;  $SD = \text{out-of-range value}$ ), the mean for the operating grant ( $M = 95,784,065$ ;  $SD = \text{out-of-range value}$ ) in thousands of Canadian Dollars and the mean for the operating grant per FTE/FLE students ( $M = 13,586$ ;  $SD = \text{out-of-range value}$ ) in thousands of Canadian Dollars. Out-of-range values meant that, in this context, the distribution was severely skewed.

Programms	Alberta	Province BC	Total (%)
"Non parchment programs"	1	0	1 (2.2)
"Certificates Diplomas Adult Completion"	4	5	9 (19.6)
"Certificates Diplomas Adult High School Completion Apprenticeship Collaborative Degrees"	7	9	16 (34.8)
"Apprenticeship Certificate Diplomas Technical Applied Baccalaureate"	2	0	2 (4.3)
"Certificates Diplomas Applied Baccalaureate"	2	4	6 (13.0)
"Comprehensive Under and Post Graduated"	5	7	12 (26.1)
Total	21	25	46

**Table I.**  
Frequencies and percentages for the programmes strategy of PSIs in Western Canada

Research	Alberta	Province BC	Total (%)
"Applied Research"	5	5	10 (21.7)
"Applied Research & Scholarly Activity"	12	13	25 (54.4)
"Comprehensive Research Function"	4	7	11 (23.9)
Total	21	25	46

**Table II.**  
Frequencies and percentages for the research strategy of PSIs in Western Canada



As a summary, the descriptive univariate statistics on census data showed that the majority of PSIs in Western Canada were comprehensive in terms of their teaching programmes (i.e. 60.9 per cent of the PSIs in Western Canada tended to be the most comprehensive possible in terms of their programmes offerings), but not in terms of their research profile (i.e. 23.9 per cent of the PSIs in Western Canada tended to be comprehensive in terms of their research programmes). This was believed to be related to the fact that comprehensive teaching programmes led to increased enrolments (i.e. with an increase in operating grants and revenue), whereas comprehensive research programmes led to increased costs (i.e. with no direct increase in operating grants and revenue). Out-of-range standard deviations for all the performance outcomes demonstrated the high level of variability among PSIs in terms of governmental funding streams.

*5.1.2 Interrelationships between themes for management control system.* Descriptive bivariate statistics and other non-parametric statistics were used to quantitatively explore the interrelationships existing between themes of MCS in Western Canadian PSIs (Table III).

In terms of the strategic stance and implementation plans, there was a statistically significant positive interrelationship between the Roles & Mandates of the PSIs and:

- the strategy of the programmes (rs (46) = 0.69,  $p < 0.000$ ); and
- the strategy of the research (rs (46) = 0.66,  $p < 0.000$ ).

A Kruskal–Wallis test revealed a significant effect of the Roles & Mandates of the PSIs on the strategy of the programmes ( $h(2) = 31.85, p < 0.000$ ). Post-hoc tests using Mann–Whitney tests with Bonferroni corrections showed a significant difference between mean ranks of excellence of the programmes for “Baccalaureate and Applied

	Role & Mandate	Strategy programmes	Strategy research	Operating grant	FTE/FLE	Operating grant/FTE/FLE
Role & Mandate	1.000 46					
Strategy programmes	0.697** 0.000 46	1.000 .				
Strategy research	0.661** 0.000 46	0.922** 0.000 46	1.000 .			
Operating grant	0.449** 0.002 46	0.452** 0.002 46	0.406** 0.005 46	1.000 .		
FTE/FLE	0.444** 0.002 46	0.519** 0.000 46	0.477** 0.001 46	0.891** 0.000 46	1.000 .	
Operating grant/FTE/FLE	0.174 0.248 46	-0.44 0.771 46	0.011 0.944 46	0.152 0.312 46	-0.214 0.153 46	1.000 . 46

**Table III.**  
Spearman rho correlations

**Notes:** \*\*. Correlation is significant at the 0.01 level (2-tailed); \*. correlation is significant at the 0.05 level (2-tailed); Spearman's rho < 0.3 = weak correlation; Spearman's rho > 0.3 and < 0.7 = moderate correlation; Spearman's rho > 0.7 = strong correlation

Studies Institutions and Comprehensive Academic and Research Institutions” as opposed to “Comprehensive Community Institutions” and “Specialized Art and Culture Institutions and Polytechnical Institutions” ( $p < 0.000$  and  $p < 0.000$ , respectively). A Kruskal–Wallis test revealed a statistically significant effect of the Roles & Mandates of the PSIs on the strategy of the research ( $h(2) = 22.86, p < 0.000$ ). Post-hoc tests using Mann–Whitney tests with Bonferroni corrections showed a statistically significant difference between the mean ranks of excellence of the research for “Baccalaureate and Applied Studies Institutions and Comprehensive Academic and Research Institutions” as opposed to “Comprehensive Community Institutions” and “Specialized Art and Culture Institutions and Polytechnical Institutions” ( $p < 0.000$  and  $p < 0.000$ , respectively).

In terms of the monitoring plans, there was a statistically significant positive interrelationship between the Roles & Mandates of the PSIs and:

- the operating grant ( $r_s(46) = 0.44, p < 0.002$ ); and
- the FTE/FLE students ( $r_s(46) = 0.44, p < 0.002$ ).

There was a statistically significant positive interrelationship between the strategy of the programmes and:

- the operating grant ( $r_s(46) = 0.45, p < 0.002$ ); and
- the FTE/FLE students ( $r_s(46) = 0.51, p < 0.000$ ).

There was a statistically significant positive interrelationship between the strategy of the research and:

- the operating grant ( $r_s(46) = 0.40, p < 0.005$ ); and
- the FTE/FLE students ( $r_s(46) = 0.47, p < 0.001$ ).

There was a statistically significant positive interrelationship between the operating grant and the FTE/FLE students ( $r_s(46) = 0.89, p < 0.000$ ). There was a statistically significant effect of the Roles & Mandates of the PSIs on the operating grant and FTE/FLE students Kruskal–Wallis test ( $h(2) = 10.38, p < 0.006$  and  $h(2) = 12.52, p < 0.002$ , respectively). Post-hoc tests using Mann–Whitney tests with Bonferroni corrections showed a statistically significant difference between the mean ranks of operating grant for the “Specialized Art and Culture Institutions and Polytechnical Institutions” as opposed to the “Comprehensive Community Institutions” ( $p < 0.01$ ) and as opposed to the “Baccalaureate and Applied Studies Institutions and Comprehensive Academic and Research Institutions” ( $p < 0.01$ ). Post-hoc tests using Mann–Whitney tests with Bonferroni corrections showed a statistically significant difference between the mean ranks of FTE/FLE students for the “Specialized Art and Culture Institutions and Polytechnical Institutions” as opposed to the “Comprehensive Community Institutions” ( $p < 0.02$ ) and as opposed to the “Baccalaureate and Applied Studies Institutions and the Comprehensive Academic and Research Institutions” ( $p < 0.02$ ).

As a summary, the descriptive bivariate statistics and other non-parametric statistics quantitatively showed that there was a statistically significant functional interrelationship between the Roles & Mandates of PSIs in Western Canada, and their strategy implementation as well as performance metrics. The more comprehensive the Roles & Mandates of the institution (i.e. “Baccalaureate and Applied Studies Institutions

and Comprehensive Academic and Research Institutions”), the more comprehensive the strategy of the programmes and the more comprehensive the strategy of the research. The more comprehensive the Roles & Mandates of the institution, the more comprehensive the strategy of the programmes, the more comprehensive the strategy of the research, the higher the level of operating grant and the higher the number of FTE/FLE students.

*5.1.3 Link to research questions.* The quantitative analysis of the institutional documents showed that MCS in Western Canadian PSIs stated their alignment in terms of strategic stances, implementation plans and monitoring plans (Berry *et al.*, 2005). It was thus observed that ideal types of PSIs existed according to the stated quantitative information in institutional documents.

### *5.2 Grounded theory analysis of formal management control system in the institutional documents*

The core themes extracted from the institutional documents were:

- the documents’ formal description and explanation of MCS; and
- the documents’ formal description and explanation of changes in the contingencies of PSIs based on changes in the regulatory accountability systems, competitive markets and organizational culture.

Please refer to [Table IV](#) for details on the extracted core themes and subordinate themes, as well as exemplary quotes[5].

*5.2.1 Management control system.* In terms of the strategic stance and implementation plans, analyses showed that PSIs were strategically aligned with the Roles & Mandates assigned by the government. PSIs were publicly funded and board-governed with a majority of the board members appointed by the government. As a consequence, PSIs were expected to follow the Roles & Mandates from the government as tightly as possible to demonstrate compliance. Analyses also showed that because of their Roles & Mandates, PSIs emphasized a learner-centred approach in the provision of their programmes, research and services. Depending on their Roles & Mandates, PSIs emphasized a more or less comprehensive approach to teaching, research and service to the community.

In terms of the monitoring plans, analyses showed that PSIs were expected to compare positively to each other or to previous years on effectiveness and efficiency metrics. PSIs systematically reported FTE/FLE numbers and focused on their value in terms of “return on investment”. PSIs were also expected to be accountable for their effectiveness and efficiency metrics. More specifically, PSIs needed to meet both the government’s compliance standards and the community’s expectations to receive funding.

*5.2.2 Contingencies.* In terms of the regulatory accountability systems, analyses showed that the theme of regulatory pressures was related to the themes of stewardship and accountability. There were growing pressures on PSIs for them to focus on their need to serve the community (i.e. stewardship) and demonstrate accountability (i.e. responsible management).

In terms of the competitive markets, analyses showed that the theme of competitive markets was related to the themes of growth management, focus on students’ and employers’ demands and focus on alternative learning models. Presidents’ and/or the

Core Theme Subordinate Themes	MCS Exemplary Quotes
Strategic stance and implementation plan	<p><i>Baccalaureate and Applied Studies Institutions and Comprehensive Academic and Research Institutions</i></p> <p><b>Roles &amp; Mandates:</b> Comprehensive baccalaureate and graduate programmes, comprehensive research function, learners interested in a comprehensive, research-intensive environment "Within a vibrant and supportive learning environment, the University of XXX discovers, disseminates, and applies new knowledge through teaching and learning, comprehensive research and creative activity, community involvement, and partnerships. The University of XXX gives a national and international voice to innovation in our Province, taking a lead role in placing Canada at the global forefront for research"</p> <p><i>Specialized art and Culture Institutions and Polytechnical Institutions</i></p> <p><b>Roles &amp; Mandates:</b> Apprenticeship, certificate and diploma programmes for technical vocations, some applied and baccalaureate degrees in specified areas, applied research and scholarly activity, learners interested in career and technical programming</p> <p>"XXX vision is to be globally valued for student success in technical areas, applied research, and innovation. Students are successful when they realize their academic, career, and organization." "XXX shall be an innovative organization equipping people to compete successfully in the changing world of work by providing relevant, skill-oriented education"</p> <p><i>Comprehensive Community Institutions</i></p> <p><b>Roles &amp; Mandates:</b> Certificates and diplomas, adult high school completion, apprenticeship, primarily collaborative baccalaureate programming, applied research and scholarly activity, learners interested in preparatory, career and academic programming</p> <p>"We transform lives and communities. As a student of XXX College, you will benefit from the comprehensive education and training offered here, and you will also contribute to the transformation of other individuals and the communities where you live, study and work"</p> <p>"XXX College welcomes students from across the Province and around the world, serving them with more than 700 full-time, part-time, and contract faculty and staff who speak more than 50 languages. More than 390 international students studied in credit programs"</p> <p>"XXX College saw enrolment increasing 1.5% to 1,294 full-lead equivalent students. This increase was in part, attributed to adding the second and final year of the Business Administration Diploma"</p> <p>"To balance the budget we were forced to eliminate 19.92 full-time equivalencies. The total dollar value of budget cuts reached \$168 million and impacted students, staff, faculty and administration. Exercising sound fiduciary responsibility isn't always easy, particularly after experiencing previous years of off-setting increases to base grants and recording surpluses"</p> <p>"XXX budgeted a \$1.7 million deficit for the 2010-2011 year as the institution carried out its plan to finish the final phase of the xxx campus residence renovations. The actual result as June 30, 2011 was an excess of revenue of \$2.8 million over expenses. This variance is attributed to additional grants and investment income (\$12.7 million), additional contract revenues (\$781,000) and strong student numbers resulting in tuition fees being \$1.9 million over budget and cafeteria, bookstore and residences being \$1 million better than budget"</p> <p>"A Social Work professor who volunteers as a magician at local schools and hospitals. A Nursing instructor who helps the homeless. An Open House event (Campus Fair) that welcomes 5,000 people to our campus. A Faculty of Medicine research project that offers new hope in the fight against cancer. A Science Professor who introduces children to the wonders of bats. These are just a few of the many ways the XXX and its faculty and staff give back to the community. Connecting to people and organizations is an important part of what we do, because we have a duty to see that people in the community receive a substantial return on the investment they make in their University and in education as a whole"</p> <p>"Thanks to its entrepreneurial outlook, responsible fiscal management and focus on the year's strategic priorities of Teaching Excellence, Employee Engagement, Systems and Process Efficiencies and Workforce Development, the President of XXX continued to deliver the job-ready graduates needed to fuel the economy"</p>

(continued)

**Table IV.**  
Core themes and subordinate themes with exemplary quotes for institutional documents

Table IV.

Core Theme Subordinate Themes	External & Internal Strategic Analysis Exemplary Quotes
Regulatory Accountability system	<p>"The University of XXX is a place of education and scholarly inquiry. Its mission is to seek truth and disseminate knowledge. Our aim is to pursue this mission with integrity for the benefit of the people of Alberta, Canada and the world"</p> <p>"XXX University, Canada's Open University, is dedicated to the removal of barriers that restrict access to and success in University-level study and to increasing equality of educational opportunity for adult learners worldwide. We are committed to excellence in teaching, research and scholarship and to being of service to the general public (stewardship)"</p> <p>"Our values: Accountability/Transparency/Integrity, Respect, Human Development, Accessibility, Excellence"</p>
Competitive markets	<p>"We consult with non-profit organizations on how we can provide support and guidance on social issues. We meet with the communities that surround our campus to talk about growth issues and other areas of mutual concern. Every faculty has a community advisory group that adds insight into our long-term planning"</p> <p>"Given the changes in the external environment and the successes we have achieved, the plan indicates that we must build on our strengths as a destination University and focus on the quality of the broader learning environment for our students, faculty and staff. In the ever more competitive environment and with growing fiscal constraints, there will be a need for greater flexibility and optimization of resources as well as renewed emphasis on engaging our community, locally, nationally and internationally"</p> <p>"XXX University embraces internationalization in every aspect of campus life because having a diverse University community helps us learn how to approach the world's complex problems and needs of employers. It is also more fun to have lots of international students." Institution xx</p> <p>"XXX is a leader in open, distance and online education to support the needs of our learners and community"</p>
Organizational culture	<p>"XXX University is no "ivory tower". It is open, innovative and inspiring. It proudly and tirelessly strives to do the best for its students, alumni, employees, donors, business and industry partners, and our local and global communities." Institution xx</p> <p>"Our employees are committed to ensuring students are supported, engaged and encouraged to excel in whatever they choose to do. Students are, and always will be, our number one priority. I will continue to support innovation that contributes to providing the highest quality of learning, research and self-discovery available"</p>



Chairs of Board of Governors' messages expressed that PSIs were mandated to have a local, national and/or international approach to their growth and to focus on the needs of the students in an enlarged community (e.g. international students). Institutional documents focused on alternative learning models as a way to adapt to changes in competitive markets (e.g. the need for an online and blended learning model to attract international students who did not wish to leave their own country, but wanted to study with a Western Canadian PSIs).

In terms of the organizational culture, analyses showed that the theme of organizational culture was associated to the idea that PSIs had been through a paradigm shift that made them be less focused on an "ivory tower" mentality and more focused on being dedicated to students' success and innovation for the benefit of the community.

*5.2.3 Link to research questions.* The qualitative analysis of the institutional documents showed that Western Canadian PSIs stated their alignment in terms of strategic stances, implementation plans and monitoring plans within a specific contingency framework in terms of regulatory accountability systems, competitive markets and organizational culture (Berry *et al.*, 2005). It was thus observed that ideal types of PSIs existed according to the stated qualitative information in institutional documents.

### *5.3 Grounded theory analysis of informal management control system in the transcripts*

The core themes extracted from the semi-structured interview transcripts were:

- informal description and explanation of MCS; and
- informal description and explanation of changes in the contingencies of PSIs based on changes in the regulatory accountability systems, competitive markets and organizational culture.

Please refer to [Table V](#) for details on the extracted core themes and subordinate themes, as well as exemplary quotes[5].

*5.3.1 Management control system.* In terms of strategic stance and implementation plans, transcript analyses showed that PSIs were strongly strategically aligned with the Roles & Mandates assigned by the government. However, it also appeared that this approach to accountability was biased, as analyses highlighted the reluctance of senior managers to express their actual thoughts and actions on paper (i.e. enacted strategy as opposed to stated strategy).

In terms of the monitoring plans, transcript analyses showed that changes in Roles & Mandates had influenced strategy evaluation, with senior managers' priorities being to implement government-driven reforms and community-driven actions in an effective and efficient manner. However, it also appeared that this approach to accountability was biased. Indeed, the analyses highlighted that PSIs tended to report self-serving indicators to demonstrate compliance and obtain funding. The lack of consultation with PSIs by the government when setting up its MCS resulted in a lack of proper definition of what constituted performance in PSIs, which resulted in the use of self-serving indicators by PSIs. Also, a lack of proper definition of what constituted performance in PSIs was responsible for a lack of complete endorsement by senior managers of the performance metrics imposed by the government.

**Table V.**  
Core themes and subordinate themes with exemplary quotes for semi-structured interviews

<i>Data set</i>	<i>Strategic stance and implementation plan (biased compliance)</i>
<i>Core Themes</i>	
<i>Subordinate Themes</i>	
<i>Grounded theory analysis of the semi-structured interviews</i>	
<i>MCS</i>	
<i>Exemplary Quotes</i>	

*(continued)*



*Data set*

*Core Themes*

*Subordinate Themes*

Strategic stance and monitoring plan  
(biased compliance)

*Grounded theory analysis of the semi-structured interviews*

*MCS*

*Exemplary Quotes*

"5 years ago, the government to make us accountable, they made the campus Alberta: the 6 sector model. Mandates of Institutions were defined by whatever category they were in... With the research institutions, the baccalaureate institutions, the polytechnics, the special purposes and independent academic institution (or faith based institutions) and comprehensive community colleges..."

"We were much more accountable for the use of unattached envelopes, so we were funded on the basis of how many FTEs we were expecting to generate and if we fell below that target we had to justify it, and if we couldn't justify it to the satisfaction of the government, they were getting to the point where they would pull funding back..."

"Accountability... Conversation about that is a big factor... If you are spending millions or billions then there is going to be some way to account if you are getting your money back.... There was recognition that some institutions were more efficient in turning out a good product without having their hands out asking for more money.... It was alternative sources of funding but really showing accountability with the dollars they had"

"There is that obsession with accountability and all the jargon stuff but they don't know how to measure productivity... Government reacts to polls so their strategy reflects the latest poll and evolves! And accountability is important for them but they don't have a good model to measure it. What the outputs are and who is accountable is important but provincial government focused more on input measures (like students, courses taught, hours per week of work) instead of the outputs measures (what type of students do we have once they graduated). Bureaucrats do not consult institutions... So, it is not clear and makes a fair bit of chaos in post-secondary education in Alberta and in the country. People just report whatever shows best. And it doesn't really mean anything"

"They were collecting all these numbers, but what I learnt is that not everything you can measure is important and not everything that is important can be measured"

*(continued)*

Table V.

<i>Core Themes Subordinate Themes</i>	<i>External &amp; Internal Strategic Analysis Exemplary Quotes</i>
Regulatory accountability system (biased compliance)	<p>“In regards to the government impact on the organization, uuuh, they first of all, there was a change in government in the early, it was probably in about 2002, when the New Democratic Party was defeated and the liberal party came in and they have much more of a conservative influence. And so that played itself in two ways, one was a reduction of funding simply because they wanted to be more fiscally responsible I suppose. And that of course brought programs cuts and lay off and so forth. I guess the other change from government is that they became much more militant in terms of making the institutions accountable for their use of the funds and so, uuuh, more and more funding became tied to specific target groups or very specific objectives as opposed to giving us a block a funding we can do as we chose. The funding was split up between envelopes for, you know, aboriginal issues or, you know, developing trades etc. . . . And, so the institution lost a great deal of flexibility in terms of how they could allocate the funding”</p> <p>“It was always crisis management with a huge black hole that was eating up all the money and never ending. . . It was always a chore to compete against the Ministry of Healthcare! Funding was also necessary in Advanced Education. But the easy place to take money from was from Advanced Education to put it in Healthcare. . . The Premier said that education could wait but not healthcare. . .”</p> <p>“Executive leaders of the future need to be very comfortable with ambiguity and uncertainty. The environment used to be very consistent over time, and people had been growing up in that stable environment. But, now they need to deal with ambiguity and uncertainty for funding and everything from government”</p> <p>“From the viewpoint of funding, the whole approach has changed from a period of 10 years ago. . . . 10 years ago, we had stable and predictable funding with 6% increase every year guaranteed on a 3 years rolling cycle! And 4 years ago all changed overnight. . . 1% a year for the last 3 years! . . . And 60% of revenue comes from the government so it had a major impact on how to develop the strategy. Before it was a multi-years increase with an idea on the long run of what we would be getting. So, you were able to build a strategy because you knew what would happen. . . . But now, you don’t know anything until the last minute”</p>

*(continued)*



Competitive markets (biased compliance)

"So the provincial government was the primary stakeholder.... They were the primary funding provider of the institution ... Financial constraints have impacted the institution... It was only provincial government mandates and not at all the community... A lot of this was related to the lack of money and the lack of resources. Trying to make education more efficient, with more technology just to make education cheaper...."

"5 to 10 years ago, our reputation was based on great faculty, BUT it is not the primary criteria anymore... That was no more the most important... What set us aside as compared to competition for employers? What was the best value for investment of time and money of employers and the students? Students want some athletics programs and employers want some good tech skills. Let's do that then! At the end of the day, we were not really into adapting to demands as much as adapting to the government and consequences for the organisation"

"I have been at this institution for 4 years and what I could see is an increase in community relations or the fundraising focus of the organization.... It is a total focus on donor's stewardship and being able to create that relationship with donors... Like, for example, we need some endowments to be able to finance some positions.... So, this is money donated where the principal stays the same but the interests are being used to pay for the salary of someone. They changed a few admin people for them to be fundraisers as opposed to managers of the curriculum and increase these endowments..."

"The competition of the universities (...) It increasingly became a factor in our enrollments particularly in my department, uuuuh, because other universities offered that commerce degree and so the diploma programs that we offered were certainly negatively impacted (...) We were also facing private competition, some institutions opened up in town and were scooping away students on the basis of reduced level of tuition. Urrr, we became aware that they were offering very sub-standard credentials but... Our students were going to them"

"Dr XXXX was the President of XXXX and he created the word "co-petition" ... We are expected to work together but at the end of the year the most FTEs or satisfaction rates got more dollars. So we cooperate but compete ..."

*(continued)*





5.3.2 *Contingencies*. In terms of the regulatory accountability systems, transcript analyses showed that changes in regulatory accountability systems were perceived to be cyclical and dependent on the political party in power. Changes in regulatory accountability systems were seen to depend on whether elected governments were more or less conservative versus liberal. As such, changes in regulatory accountability systems were observed to be not related to the legislation governing PSIs (e.g. Post-Secondary Learning Act, 2004), but to the political cycles that affected policies and funding to the public sector including PSIs. The Roles & Mandates stated the need for PSIs to be fiscally responsible (i.e. reduce costs) and to find alternative sources of funding (i.e. reduce dependence on governmental funding). However, it also was observed that this approach to accountability was ambiguous and problematic, as results highlighted that PSIs were asked to be more fiscally responsible (i.e. with increased costs related to increased level of compliance requirements from the government) despite a substantial decrease in resources provided by the government over the years (i.e. operational and capital grants) and last-minute changes in strategic stances (i.e. uncertainty).

In terms of the competitive markets, transcript analyses showed that the theme of competitive markets was associated to the theme of institutional partnership, as well as the theme of changes in students' and employers' demands (i.e. more skills-oriented). The focus on competitive markets was however described as less important than the focus on regulatory accountability systems. It also appeared that this approach to accountability was ambiguous and biased, as analyses highlighted that PSIs competed to get higher FTE/FLE students, despite the fact that they were asked to collaborate by the government and claimed they were collaborating (i.e. this inconsistency in the collaboration pattern was called "co-petition").

In terms of the organizational culture, transcript analyses showed that the theme of organizational culture was associated to the themes of culture shift (i.e. from a public good within a sector to an accountable business within an industry, and to a managerial and entrepreneurial culture). The focus on organizational culture was however described as less important than the focus on regulatory accountability systems. It also appeared that this approach to accountability was both uncertain and incomplete, as the transcript analyses highlighted that PSIs tended to have a culture shift that was only observed at the senior managers' level with some resistance within staff and faculty. The transcript analyses indicated that senior managers understood the changes in strategic stance required by the government in terms of financial accountability and that they were or would be terminated if they failed to understand these changes. In contrast, faculty and staff were observed to be resistant to changes in strategic stances at the frontline level of the teaching programmes, research and service outcomes.

5.3.3 *Link to research questions*. Formal MCS in Western Canadian PSIs were aligning strategic stances, implementation plans and monitoring progress towards the accomplishment of strategic plans within a specific contingency framework in terms of regulatory accountability systems, competitive markets and organizational culture (Berry *et al.*, 2005). There was a misalignment, however, of informal MCS in Western Canadian PSIs with a difference between the stated level of compliance and the enacted level of compliance. As such, it was observed that ideal types of PSIs existed according to the stated strategy in institutional documents, but were not enacted as such. This meant that any formal MCS around Roles & Mandates from the government would not

fit well and required interpretation and understanding by the agents giving scope for information asymmetry and self-serving motivation (e.g. choices of metrics and how they were defined or measured) with biased compliance. In other words, it showed the use of informal customization to have a workable MCS and for the PSIs to manage themselves in the light of incomplete, inexact and/or ambiguous regulatory accountability systems.

Please note that the unstructured interviews conducted for validation purposes confirmed the accuracy of the GT analysis of the semi-structured interviews including at the level of the biased compliance[3].

## 6. Discussion

The intent of this relativist research case study was to be an expansion from the guiding principles or research questions to develop an exploratory contingency theoretical framework that provides enough description to be a starting point for further research combining formal and informal MCS into an integrative contingency-based framework of MCS (Cooper *et al.*, 2014; Strauss *et al.*, 2013; Malmi and Brown, 2008; Chenhall, 2003; Flamholtz *et al.*, 1985; Otley, 1980).

The literature review led to the formulation of the research questions as a basis for a relativist GT research. The research questions were:

- RQ1. Whether and how changes in the MCS of PSIs in Western Canada could be described and explained in terms of formal and informal MCS?
- RQ2. Whether and how changes in the MCS of PSIs in Western Canada could be described and explained in terms of regulatory accountability systems, competitive markets and organizational culture?

These research questions were used as guiding propositions in Section 5 to explore the findings. Now, we turn to examining the research findings in relation to other research in the literature to develop a further exploratory theoretical framework for the description and explanation of MCS in PSIs.

### 6.1 Formal and informal management control system

A first focus of the research was to describe and explain MCS of PSIs in Western Canada in relation to formal and informal MCS (Anthony and Govindarajan, 2007; Berry *et al.*, 2005).

The findings showed that there was a functional interrelationship between the Roles & Mandates (i.e. strategic stance) of PSIs, strategy implementation and strategy monitoring, which demonstrated the significance given to formal MCS in the Western Canadian environment both in the quantitative and qualitative parts of this research. These findings concurred with the arguments of several authors, as changes in strategic stance were related to an increased pressure for accountability in terms of effectiveness and efficiency (Malmi and Brown, 2008; Anthony and Govindarajan, 2007; Berry *et al.*, 2005).

There was an inconsistency, however, between the findings obtained through the institutional documents (i.e. formal MCS) and the findings obtained through the semi-structured interview transcripts (i.e. formal and informal MCS). In the institutional documents, MCS were described as paramount with the “aim is to pursue this mission with integrity for the benefit of the people of Canada and the world” and with PSIs

strongly focusing on demonstrating accountability, whereas from the semi-structured interview transcripts, MCS were described as “more of a show” for the government and the community with the rationale that there was an inconsistency between what senior managers stated and what senior managers enacted within the PSI.

The inconsistency between the findings from the institutional documents and the semi-structured interview transcripts brought into focus an issue of biased compliance. This biased compliance was not a wilful lack of compliance, but followed from choices of the way information was collected and reported by the agent (i.e. PSIs) to demonstrate compliance to the Roles & Mandates set-up by the principal (i.e. government). This phenomenon may be the result of imprecision, ambiguity and/or complexity in the setting of Roles & Mandates and organizational performance metrics that were created (Krishnan *et al.*, 2005; Ittner and Larcker, 2003). In this context, biased compliance may have been an outcome of information asymmetry, which made it possible for the humans in the informal MCS to customize the required performance metrics and demonstrate compliance (Hayne and Free, 2014; Broadbent *et al.*, 2010). It was also observed that senior managers had the inclination to prefer self-serving performance reporting, which had a detrimental impact on the reporting of actual performance metrics (Moore *et al.*, 2006; Nelson and Tayler, 2006; Bazerman and Watkins, 2004; Kadous *et al.*, 2003; Beeler and Hunton, 2002; Phillips and Phillips, 2002).

### 6.2 Contingencies of management control system

A second focus of the research was whether and how changes in the MCS of PSIs in Western Canada could be described and explained in terms of regulatory accountability systems, competitive markets and organizational culture (Cameron and Quinn, 2006; Bakar and Berry, 1993; Lebas and Weigenstein, 1986; Ouchi 1980).

The findings showed that there were some changes in terms of the regulatory accounting systems as well as changes in the focus on competitive markets. The findings were in line with previous research (Broadbent and Laughlin, 2005; Deem and Brehony, 2005). In terms of regulatory accountability systems, it was observed that PSIs were having to deal with increased regulatory and accountability pressures (i.e. regulatory bodies and audits, accessibility, responsive to tax payers, business community and potential employers, employment outputs, affordability, return on investment, resources effectiveness) and decreased funding availability. Constrained resources were resulting in a disproportionate focus on excess of revenues over expenses and financial statements (i.e. consolidated statements of cash flow and financial position as audited by Auditors General or KPMG) instead of accessibility, responsiveness and affordability (Broadbent and Laughlin, 2005; Deem and Brehony, 2005). In terms of competitive markets, findings were in line with previous research that showed that PSIs had to deal with market competition to maximize their access to alternative sources of revenues and continue collaborating with each other by their Roles & Mandates to maximize efficiencies at the provincial level. PSIs were in a difficult position of co-competition. PSIs were required to collaborate with each other in their Letter of Expectation to maximize efficiencies at the provincial level, but PSIs were in fact competing with each other to maximize their access to funding and alternative sources of revenues (Fried and Hill, 2009; Lerner *et al.*, 2008). In terms of organizational culture, the findings from documents and transcripts were in line with previous research that showed that PSIs had to handle changes in their external and internal culture where

there was a relative psychosocial and cultural alignment of senior managers (Cameron and Quinn, 2006; Kezar *et al.*, 2006), but where there was much less psychosocial and cultural alignment of staff and faculty (Meek *et al.*, 2010; Broadbent *et al.*, 1997). The relative psychosocial and cultural alignment of senior managers was associated to an accelerated process of termination of senior managers (i.e. increase of senior managers' turn-over rate) that possibly resulted in senior managers being more concerned about reporting the "right metrics" (Deem and Brehony, 2005; Amaral *et al.*, 2003) than reporting the "true metrics" (i.e. with more information asymmetry and self-serving motivation). Staff and faculty were currently protected by collective agreements and only attrition was expected to "positively" impact their alignment in the long run. Meanwhile, staff and faculty were resistant to changes in the external and internal strategic environment of PSIs. The formal MCS appeared not to have cognizance of this aspect of the organizational culture.

### *6.3 Integrative contingency-based framework of management control system*

The insights about how actors understand and relate to MCS, derived from the GT analysis of the interview transcripts, provide a unique perspective on the often unobserved theatre of organizations. The denomination of formal MCS has led to the less accurate description of everything else as informal when, as the research reported here demonstrates, there is a wider view based upon regulatory accountability systems, competitive markets and organizational culture. In an integrative approach, the psychosocial or cultural factors of the wider system and those of the PSIs are crucial elements to understand how MCS are enacted (Cooper *et al.*, 2014; Strauss *et al.*, 2013; Chenhall, 2003; Otley, 1980). In this conception, humans mediate the incompletely specified formal MCS, its uncertainties, its ambiguities, its varying time horizons for current and future work and its need to signal change before work is completed together with varying cognitions and values of actors for technical systems cannot hold uncertainty or ambiguity.

The observations of biased compliance may be too simple a description of varying constructions of different actors. Maybe this ascription of bias serves to free the principal from having to consider its own biases. From an analytical standpoint, the whole system of MCS is a complex field where the formal MCS is providing a legitimated anchor for work. There may be ethical issues of ambition, errors and cover ups, as well as organizational game playing. Humans in organizations and organizational fields construct many paths of communication often faster and richer than any formal organizational pathways. It may be conjectured that the social system carries the conflicts of values and cognitions that Scott (2008) perceived, together with modes of order, as critical elements of new institutional social theory. Hence, the requirements of regulatory accountability systems need customization, as surely as they are products of complex processes of social and technical constructions.

As uncertainty related to changes in PSIs contingencies increases (i.e. change in regulative edicts; Broadbent *et al.*, 2010), more complex forms of communication become necessary to integrate what appropriate accounting means as a result of ongoing organizational change (Chapman, 1997). Under high uncertainty, governments may use MCS, but this may take place within an integrative approach that involves intense verbal communication between organizational groups with associated differentiation

and customization processes (Ogata and Spraakman, 2013; Chapman, 1997). As such, it may be argued that change is not achieved due to the stated adoption of MCS (e.g. Roles & Mandates), but through a process of customization with a collective effort requiring negotiation and agreement between organizational groups in order for organizational groups to be mobilized in support of the enacted change (Ogata and Spraakman, 2013).

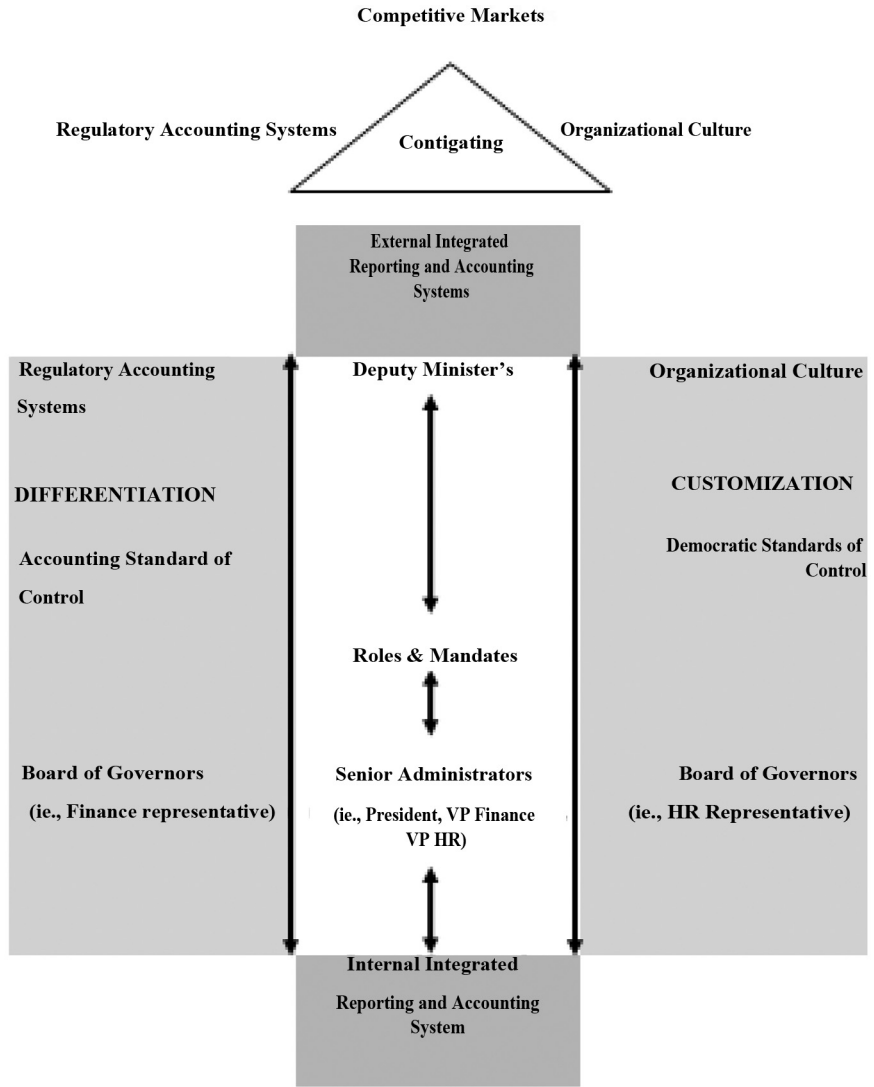
Such a customization approach is based upon rule-based MCS (i.e. its structured and perhaps mechanistic view of rules, control processes and associated contingencies), market-based MCS (i.e. including the dynamics of competition and collaboration) and culture-based MCS (i.e. including a relational view of MCS and associated contingencies that would include psychosocial and cultural factors as key variables) (Cooper *et al.*, 2014; Strauss *et al.*, 2013; Malmi and Brown, 2008; Chenhall, 2003; Flamholtz *et al.*, 1985; Otley, 1980). First, external regulatory accountability systems within the formal MCS are created by the principal. In line with the concept of “accounting standards of control”, accountability pressures are enshrined in the acts (i.e. Auditor General Act, 1985) and provide the government with the institutional means to oversee PSIs (Hayne and Free, 2014). Governments support a variety of regulatory and auditing bodies, and endorse certain standard setters whose role is to implement the various laws and financial accountability provisions (Hayne and Free, 2014). Second, internal regulatory accountability systems within the regulatory accounting systems are also created by the principal. The link between the principal and the agent relates to incentives for compliance that are formed within a top-down communication process. PSIs are compared to one another to benchmark their costs and performances in line with the performance metrics given by the government (Glass *et al.*, 2009). However, MCS may benefit from being customized in a consultative manner with a two-way communication process between the principal and the agent as discussed previously (Cooper *et al.*, 2014; Strauss *et al.*, 2013; Malmi and Brown, 2008; Chenhall, 2003; Flamholtz *et al.*, 1985; Otley, 1980). Third, internal regulatory accountability systems for the organizational culture may also be allowed by the principal. Internal regulatory accountability systems may be considered arbitrary by the agent, most of all when they are created within a top-down communication process as shown in the research. Resistance is observed when internal regulatory accountability systems are considered arbitrary by the agent. MCS may be questioned by senior managers, when MCS are regarded as meaningless and/or needlessly time-consuming and costly (Meek *et al.*, 2010; Broadbent *et al.*, 1997). MCS could be set-up in a consultative manner with a two-way communication process between the principal and the agent (Cooper *et al.*, 2014; Strauss *et al.*, 2013; Malmi and Brown, 2008; Chenhall, 2003; Flamholtz *et al.*, 1985; Otley, 1980). To reduce information asymmetry and adverse selection of information, an independent Finance and/or Human Resource representative with expert knowledge on regulatory accountability systems and organizational factors may sit on the board of governors of PSIs. To reduce self-serving motivations and moral hazard, the board of governors may be in constant direct communication with the Finance and Human Resource departments of the PSIs.

Please refer to Figure 1 for more details on the exploratory contingency theoretical framework.

Such an exploratory contingency theoretical framework leads to the following guiding propositions for consideration in future research:

- Future Research Guiding *PI*: How are the elements in the integrative model interdependent? How do changes in any element of regulatory accounting





**Figure 1.**  
Exploratory  
theoretical  
framework of  
accountability within  
an integrative  
contingency-based  
framework of MCS

**Two-Ways Communication Process of Differentiation and Integation**

systems, competitive markets and organizational culture lead to changes in each of the other elements which would then lead back to changes in the initial element?

- Future Research Guiding *P2*: How are changes in regulatory accounting systems, competitive markets and organizational culture in subordinate institutions (i.e. the PSIs) mediated by the various constructions and interpretations of the actors?

- Future Design Guiding *P3*: In what context would MCS benefit from being designed and operated in a consultative milieu with open communication processes between institutions and actors in the domain (e.g. government, regulatory and auditing bodies, board of governors, senior managers, staff and staff representatives)?

## 7. Conclusions, implications and limitations

A relativist case study was conducted using mixed methods to argue that an integrative framework provided a constructive route to developing a wider description and understanding of MCS within a principal-agent relationship.

The theoretical contribution of such an integrative contingency-based framework of MCS subsumes the mechanistic and/or organic view of MCS. The resulting exploratory theoretical framework within an integrative contingency-based framework of MCS focuses on the use of regulatory accountability systems, competitive markets and organizational culture in the description and understanding of MCS conditioned by extrinsic factors (e.g. steering media) and intrinsic factors (e.g. endorsement of a strategic stance) (Cooper *et al.*, 2014; Malmi and Brown, 2008; Chenhall, 2003; Flamholtz *et al.*, 1985; Otley, 1980).

Charmaz (2003) proposes a version of the GT analysis that “assumes the relativism of multiple social realities, recognises the mutual influence of knowledge by the viewer and viewed, and aims toward an interpretative understanding of subjects meaning”. One potential strength of the research was that this interpretative approach accepted the truth as dependent on the viewpoint of the researcher and multiple sources (Suddaby, 2006; Easterby-Smith *et al.*, 2008). The research transcended the typical research boundaries of one unit of analysis by examining several units of analysis (i.e. informants’ and institutional documents’ understanding) with a combined methodology design (i.e. quantitative and qualitative). Another potential strength of the research resulting from this interpretative approach was that the integrative contingency-based framework was using a comparative approach (i.e. iterative process) to search for a consensus (Easterby-Smith *et al.*, 2008). This process of comparison between multiple realities, including the literature review, was important in a relativist context (Schreiber and Stern, 2001; Charmaz, 2000; Strauss and Corbin, 1998). These strengths may have had a positive impact on the range of explanation of the integrative contingency-based framework, as the theoretical framework may have gained the possibility to be generalized across viewpoints without being Universalist (Easterby-Smith *et al.*, 2008).

This research had two principal limitations however. First, the heterogeneous nature of the data may be seen as an empirical weakness. The quantitative analysis of the institutional documents provided less information than a single PSI institution case analysis might have done. The GT analysis of the institutional documents and the interview transcripts while rich in itself may also have occluded significant insight due to the limited number of actors interviewed. Some support for the integrative approach was provided, however, by the follow-up interviews. Second, the findings of this research may also have had some theoretical limitations. New institutional economics following Williamson (1991) was predicated on cost minimization, but this research has not considered whether the changes in government PSIs control relationships have led to reduced costs. The pursuit of ever more complex MCS procedures may provide a greater illusion of control, when it is simply adding to the cost without any benefit.

The suggestions offered from the developed framework for future research and for future MCS design could well include a replication study using different methods and a similar and more extensive study in a different organizational field.

### Notes

1. Full references to raw data and sources are available in the publication listed under the "Further Readings" section.
2. In a GT context, it is not appropriate to create a "random sample". Interviewees were chosen on a willingness to participate basis setting out to ensure a reasonable coverage by age, experience level and gender.
3. Unstructured interviews were designed to add meaning to the data collected in the semi-structured interviews study by exploring what interviewees thought of the preliminary findings. Ontological and educative authenticity was achieved by the use of these unstructured interviews and the use of open-ended questions to encourage interviewees to be self-reflective about their perceptions and how they interpreted the dynamics surrounding the PSIs. Unstructured interviews were also used as a way to give a voice to any concerns in terms of ontological and educative authenticity of interpretations by the researcher. Unstructured interviews were also used when the need to clarify certain points or obtain a deeper understanding of a core and subordinate themes was identified.
4. The investigation of the interrelationships among core and subordinate themes, generally known as theoretical coding, was happening at the selective and axial coding level for Strauss and Corbin (1998) and Corbin and Strauss (1990).
5. Full quotes and interview examples are available in the publication listed under the "Further Readings" section.

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