# ARE EMPLOYEE SELECTION AND INCENTIVE CONTRACTS COMPLEMENTS OR SUBSTITUTES?
# A TEST IN THE CONTEXT OF ORGANIZATIONAL LEARNING

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## ABSTRACT

There is a debate in the literature as to whether employee selection is a substitute or complement to incentive contracting when it is difficult to contract on output. This study assesses empirically these choices in an environment where the firm is committed to organizational learning (OL) as a strategic priority. We argue that incentive contracts and selection can both usefully serve to support OL and that in combination these controls will support achievement of positive organizational outcomes. Our results, based on a sample of business unit managers, support our expectation. When filtering out differences in OL and firm performance, however, we also find support for Prendergast's (2011) theoretical predication that there will be a trade-off between selection and incentive contracting and that this trade-off is determined by contracting difficulties.



Key words: organizational learning, employee selection, incentive contracting

## I. Introduction

This study builds on prior empirical research (Campbell, 2008, 2012) and recent theoretical work by Prendergast (2011) to empirically assess whether selection and incentive contracts are 'compatible' control choices.[1] We do so in an environment where the firm is committed to organization learning (OL) as a strategic priority. This is an issue of direct relevance to accounting as incentive compensation contracts explicitly and/or implicitly incorporate performance measures and the appropriate use of these measures are of continuing concern to accounting researchers and practitioners alike.[2] For several decades researchers have attempted to identify the contexts in which accounting controls will work best and argued that other controls, such as whom a firm recruits and hires or what Merchant (1985) calls personnel controls, will become more important when a firm faces contracting difficulties. Campbell (2012) demonstrates the importance of selection processes when outputs cannot be easily specified and measured due to the task performed, multiple and conflicting goals and/or the environment itself.

We find Prendergast's (2011) motivating example of the trade-offs between hiring and incentives useful. He provides an example of the intensive selection processes associated with selection of university deans and how these selection committees rarely spend any time on how much the dean should get paid or the appropriate set of measures. He suggests that intensive selection processes are a substitute for incentive contracting but what isn't recognized in his example is that once the dean is selected she is typically confronted with an incentive contract that includes pre-specified KPIs, often coupled with incentive-based pay. The selection

[1] We acknowledge the insightful comments of an anonymous reviewer for drawing our attention to the possibility that contracting and selection operate as substitutes.

[2] We use the term 'incentive contracts' as a generic construct that includes the use of performance targets to measure and reward managers. .

committee might not pay much attention to this control choice but presidents and vice-chancellors certainly do as they simply cannot risk a maverick dean taking actions that might benefit their own school but not be in the best interests of the University as a whole.[3]

In this paper we follow Prendergast's (2011) line of reasoning that firms will make a choice between expending effort on selection and contracting on output. We examine whether there are trade-offs when measurability is not straightforward, in particular when a firm pursues organizational learning (OL) as a strategic priority. We choose this context for several reasons. First, we are able to respond to Campbell's (2012, 1) call for empirical research that tests whether firms 'devote significant resources to employee selection in settings where it is difficult to contract on output'. OL as a core strategic value creates an environment where 'new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where *people* (emphasis added) are continually learning how to learn...' (Senge, 1990, 3). It is exactly this type of environment that creates a potential conflict between performance-based incentive contracting and the more subtle forms of control that ensure that *people* take on the values that are critically important to the firm. While getting the design elements of a control system right is a challenge in any setting, this is particularly challenging in an OL setting as formal controls such as based on results have often been described as the 'enemy' for firms aiming to create a competitive advantage through knowledge creation (e.g., Winter et al., 1997; Amabile, 1998).

Selection processes are a means of attracting employees with aligned preferences that enable the creation of shared values (Campbell, 2012), and seem ideally suited in firms committed to OL (Kang et al., 2007). Yet we know that selection processes alone often will be insufficient as a control instrument in inhibiting excessive and costly innovation (Davila, 2000;

[3] Like Prendergast, from personal experience, pay and performance measures comes quite quickly after the selection choice although typically not discussed in selection committees.

Hirst et al., 2011). Our study enables us to contribute to the debate concerning the trade-offs among incentive contracts and informal control processes activated through selection processes, and specifically to address whether incentive contracts are consistent with a commitment to OL.

The second rationale for focusing on OL as a strategic priority is that it is considered to be a critical success factor in creating an enduring competitive advantage (Cohen and Levinthal, 1990; Kogut and Zander, 1992; Grant, 1996; Winter et al., 1997; Kang et al., 2007). And yet there are only a few studies that examine control design in firms where OL is a strategic priority (e.g., Davila, 2000; Bisbe and Otley, 2004; Ditillo, 2004; Davila et al., 2009).

Our theoretical model predicts that as OL increases in importance firms will increasingly rely on selection processes to ensure that the right individuals are employed, and on incentive contracts to support the attraction, retention and motivation of highly skilled employees while at the same time providing the autonomy needed in a learning environment.[4] Roberts (2004, 164) argues "whom a firm attracts and selects as employees can have a tremendous effect on their motivation". Following Roberts (2004) and others (Prendergast, 2011; Campbell, 2012), we capture a firm's investment in selection and recruitment processes and view this as a deliberate control design choice. Prior research demonstrates the importance of selection processes in building the human capital necessary for strategic success (Kang et al., 2007; Ouchi, 1979; Campbell, 2008, 2012). We draw on the economics and accounting literature to test whether in an OL context incentive contracts will act as complements or substitutes to selection and recruitment processes. Prior research is ambiguous as to how these controls interrelate, as it provides evidence of both complementary (Banker et al., 2001) and substitutive relations

[4] Prendergast (2011) refers to selection process as the technology for identifying talent. Consistent with Prendergast (2011) in our arguments we consider the costs of using selection processes and incentive contracting, arguing that firms with increasing commitment to OL will be willing to bear more costs, and that firms with high commitment to OL will make a (partial) trade-off between these controls.

(Prendergast, 2011; Campbell, 2012). We argue that both controls will be compatible choices as a firm's commitment to OL increases (i.e., allowing in the analysis variation across firms in their objectives), but that they will act as substitutes within the set of firms with high commitment to OL (i.e., examining only firms with the same objective function), with differential levels of contracting difficulty changing the *relative* (economic) attractiveness of the controls (Prendergast, 2011).

In our analysis, we also include an examination of whether for firms committed to OL, the combination of control choices is associated with increased shared values and firm performance. Selection processes are one way through which firms develop shared beliefs and values (Van den Steen, 2010; Campbell, 2012). We draw on Van den Steen to argue that the right combination of incentive contracting and selection processes can result in shared values which minimize the agency problems that reduce firm value.

Our findings, based on a survey of top management in 185 business units, indicate that as firms' commitment to OL increases, so does their use of selection processes and incentive contracting. Using cluster analysis, we identify two clusters with theory-consistent control designs, that is have a high commitment to OL and use both selection and incentive contracting. However, there is evidence of a trade-off between selection and control (i.e., high use of selection processes and above-median use of incentive contracting and *vice versa*) within these two clusters. Our cluster results indicate that both also achieve similar performance outcomes confirming the idea of equifinality (Gresov and Drazin, 1997); that is, firms persuing the same objective function (i.e. OL) with different emphasis of incentive contracting and selection. Our analysis enables us to speak directly to the argument of Prendergast (2011) that, given a particular firm objective, selection and incentive contracting are inversely related, and that this

trade-off relates to firms' contracting difficulties. Our cluster analysis also provides another cluster with a 'theory inconsistent' configuration in which the firms perform significantly worse than those in the other two clusters. Given the concerns in prior research over the use of incentive contracts, we undertake additional analysis to examine the types of performance measures used for evaluation, and find that high performing firms committed to OL rely to a greater extent on aggregated financial measures, and less on disaggregated financial measures, consistent with the idea that aggregated measures provide the autonomy for managers operating within an OL environment.

This study makes several contributions. Our base model provides results indicating that there is a positive relation between OL and use of both control choices, i.e. they are compatible choices as OL is increasing. This study is the first to examine the influence of OL on firms' control choices and how these choices relate to organizational outcomes. We are also able to address directly whether there is a tension between the more subtle form of control associated with employee selection and incentive contracting. We demonstrate that when commitment to OL increases, there is little conflict between these choices (as they can reinforce each other and firms will be willing to invest in both), and that the combination of both is associated with greater internalization by employees of the strategic vision of the firm, greater innovation outcomes and better financial performance. Our analysis also allows us to test Prendergast's (2011) prediction of a trade-off between employee selection and incentive contracting. We demonstrate this in the context of organizational learning. We provide evidence that when firms are committed to OL as a strategic priority, the two control choices become substitutes. This trade-off appears to be associated with contracting difficulty as predicted by Prendergast. Furthermore, such trade-offs have no significant effect on performance outcomes. The next

section reviews the literature and develops hypotheses; followed by a description of our data collection, variable measurement, model analyses and results. The final section provides a discussion of the findings and limitations of this study.

## II. Prior research

This paper draws on the strategy literature to motivate the importance of examining organizational learning (OL) as a strategic priority. We bring this together with the organization design literature to assess the implications for the choice of controls made by firms in this context. We define OL based on prior research indicating that a commitment to OL will be reflected in the organizational values that influence the propensity of the firm to create and use knowledge (Sinkula et al., 1997).[5] A commitment to OL is the fundamental value that influences the creation of a learning culture within the firm (Senge, 1990). We expect a commitment to OL to have implications for control choices as knowledge creation requires a firm to develop a capacity to acquire knowledge, to process information efficiently and to be responsive to changing market conditions. We examine two key control choices (i.e., selection and incentive contracting) in firms committed to OL and compare these choices with those in firms where OL is not a priority. Selection and incentive contracting are seen to reflect trade-offs in the economics and accounting literatures (Prendergast, 2011; Campbell, 2012), but little empirical research has tested this proposition. We develop three hypotheses which relate firms' commitment to OL to their use of selection processes and incentive contracting, and how the two

[5] Note that this definition considers OL as *strategy* and not as learning *process* (Sinkula et al., 1997). Although we might expect that commitment to OL will be higher in firms focused on innovation, this innovation could relate to firms committed to introducing new products or to those looking to improve production and technology in order to become more competitive. It is thus a different construct than prior typologies that classified firms as cost leaders/differentiators or prospectors/defenders.

control choices relate to each other. This allows us to test whether incentives and selection act as substitute control choices. Each hypothesis is developed in turn.

Following Roberts (2004), we define selection as the intensity with which specific recruitment and selection processes (e.g., employee screening, skill and attitude assessment) are used to build human capital within the firm. The intuition behind this control choice is as follows. Firms use intensive hiring processes to ensure that the 'right' person is employed. "Right" in this sense means individuals who share the values of the organization and/or will be a good 'fit'(Campbell, 2012).[6] Investing in employee selection becomes increasingly important (i.e. increasing in intensity) when it is not easy to contract efficiently on output (Prendergast, 2011). If the desired actions or output of an agent can be clearly specified, the least costly option is to monitor the actions or outcomes of the agent. This, however, assumes that the superior has sufficient knowledge that particular actions of the agent will lead to desired outcomes, and that desired outcomes can be effectively measured. If this is not the case, it becomes increasingly important that the agent's goals are aligned with the organization. It is in this setting where intensive selection processes will be used to ensure the 'right' individual is hired.

Since human capital constitutes the most critical resource required for effective learning (Cohen and Levinthal, 1990; Kogut and Zander, 1992; Grant, 1996), we expect that commitment to OL will have a significant and positive relation with the intensity of the selection process. Firms choose to invest in intensive selection processes to ensure that individuals with the required skills, attitudes and expertise to implement an OL strategy are selected. A firm committed to OL must be able to attract individuals who are continually searching for new ways

[6] We are interested in the intensity of the selection process as we believe that intensity increases when 'fit' of the individual to the organization becomes increasingly important. For example, the selection process for a Dean is more intensive than it is for a library clerk reflecting the importance of 'fit' of a Dean to the University. 'Fit' is not nearly as important as it is not costly to replace the library clerk. The effort in selecting the library clerk reflects this.

of doing things, who are able to cope with the ambiguity and uncertainty that is part of a dynamic decision context, who can react quickly to external changes, who can communicate effectively, will share information across departmental and organizational boundaries, and who will take actions that have long-term benefits for the firm. Kang et al. (2007, 248) see an additional benefit in using intensive selection processes for firms committed to OL and argue that "selecting individuals based on organizational fit provides the advantage of inculcating common values", which fits with the broader notion of 'clan control' (Ouchi, 1979). Since higher-level learning processes and outcomes typically cannot be easily monitored centrally, problems of congruence and direction of effort can be reduced by employing individuals who not only have the skill, experience, judgment, creativity and ability to make sense of a particular problem, but also have an increased probability that their personal goals align more closely with those of the firm (Roberts, 2004; Campbell, 2012). Intensive employee selection processes are not costless, however, and are therefore more likely to be used in complex decision contexts that require high levels of expertise (Snell, 1992; Abernethy and Brownell, 1999; Prendergast, 2011; Campbell, 2012). We thus expect to observe a positive relation between OL and the intensity of employee selection processes, and hypothesize that:

*Hypothesis 1: Commitment to organizational learning positively affects the intensity of firms' employee selection processes.*

We use the term incentive contracts to capture the system that provides individuals with performance targets, measures the results or outcomes achieved and provides rewards or sanctions for realized performance. Prior research provides evidence that incentive contracts (or 'output controls') will be used to a greater extent than action or behavior controls when decision making processes are complex and/or uncertain (Abernethy and Brownell, 1997; Snell, 1992). In

this context action controls directed towards monitoring the actions or effort of agents are not feasible as it is difficult to control behavior of subordinates through monitoring or close supervision for at least two reasons. First, they can restrict the autonomy and motivation of individuals selected to perform complex tasks and to exercise their judgment. Campbell et al. (2011) provide evidence that tight monitoring of behavior can strongly limit learning behaviors (experimentation) by subordinate employees. In contrast, learning was found to be much greater in business units with loose monitoring; employees had the discretion and incentives to experiment in their decision making. Similarly, Hunton et al. (2008) posit that monitoring will increase agents' risk aversion and find experimentally that monitoring reduces participants' willingness to undertake risky investment projects. Second, superiors typically do not have sufficient information to prescribe actions and to evaluate if subordinate actions were desirable (Abernethy et al., 2004).

Incentive contracts, in contrast, focus on realized outputs instead of inputs/actions. For firms committed to OL, control choices that allow and stimulate highly skilled employees to exercise discretion and judgment in their decision making will be important.[7] Incentive contracts typically are written based on aggregated performance measures such as accounting returns. These aggregated measures are designed to capture the multiple actions a manager might take in relation to expenditure, revenue or investment decisions. Thus, they allow considerable managerial discretion in the types of actions needed to achieve the desired outcome (Abernethy et al., 2004). Empirical evidence also indicates that they are effective in 'bringing the future forward'; another condition that is critical in a learning environment that is typically ambiguous and where managers must continually make trade-off decisions to respond to changes occurring

[7] Hirst et al. (2011) for instance find that the effect of individuals' learning orientation on creativity is high under decentralization, but low under centralization.

in the environment (Abernethy et al., 2013). In addition, the balance between providing incentives and discretion to employees versus the measurement costs of incentive contracts (Ortega, 2009) will be more favorable for aggregate measures. We thus expect that for firms committed to OL aggregated measures will be significantly more important in incentive contracts than disaggregated measures as they provide more discretion to managers in this environment. While incentive contracts can be costly, prior research suggests that relative to action controls they are the low cost option in complex operating environments (e.g., Milgrom and Roberts, 1992; Bloom and Milkovich, 1998). Experimental evidence also shows that incentive contracts (versus flat wages) induce learning when subjects are faced with a cognitively complex task, supporting the potential for incentive contracts to stimulate OL (Sprinkle 2000).

Another benefit of incentive contracts that can make them particularly valuable in an OL setting is that they can be used to identify and attract the most competent employees as well as attracting individuals with a higher need for achievement (Bretz et al., 1989; Prendergast, 1999; Banker et al., 2001; Trank et al., 2002; Cadsby et al., 2007). Empirical evidence indicates that incentive contracts enhance the likelihood that high performing and less risk adverse individuals are attracted to the firm; they are also effective in retaining valuable employees (Gomez-Mejia and Balkin, 1989; Cable and Judge, 1994; Banker et al., 2001; Dutta, 2003; Cadsby et al., 2007). Banker et al. (2001, 347), for instance, find that incentives act as an 'effective screening device by sorting employees by ability' and demonstrate how they can motivate 'employees remaining with the firm to continually improve their productivity, which suggests that pay-for-performance provides incentives to invest in effort that has long term performance effects'. Ittner and Larcker's (2001) survey indicates that firms invest in incentive plans to enhance recruitment and retention efforts and to upgrade the quality of the workforce. They also find that firms use

incentive contracts to enhance communication of objectives, encourage entrepreneurship and foster teamwork.

Based on this discussion we expect that a positive relation exists between firms' commitment to OL and the extent of use of incentive contracting, and hypothesize that:

*Hypothesis 2: Commitment to organizational learning positively affects firms' extent of use of incentive contracting.*

Our baseline model predicts a positive relation between OL and use of both selection processes and incentive contracts, and also suggests that incentive contracts can contribute to the selection of 'the right' individuals and retaining these individuals once they are selected. In other words, both these control choices act together to support the implementation of OL as a strategic priority. The key reason for this positive association is that with greater commitment to OL it becomes economically viable to invest more in both incentive contracting and selection mechanisms. However, the use of each imposes costs to a firm and at some stage the incremental benefit compared to the additional cost of one versus the other may differ. In Prendergast's (2011) model, firm objectives are implicitly assumed and held constant. The relation between selection and incentive contracting is thus viewed as an economic trade-off to obtain the low cost solution for achieving a given objective. Prendergast argues that firms will trade-off incentive contracting for selection when contracting difficulty increases. Contracting difficulty increases when outputs cannot be easily specified and measured. We extend our baseline model to assess whether we observe this trade-off in the subset of firms where the commitment to OL is high, and where we predict (H1 and H2) greater use of both selection processes and incentive contracting (as compared to firms where the commitment to OL is low). We test whether there is

a trade-off between selection and incentive contracting, and then examine whether this trade-off relates to contracting difficulty. We summarize our expectation as follows:

*Hypothesis 3: When commitment to organizational learning is high, selection and incentive contracting will be inversely related.*

Some prior research in the management and accounting literatures is concerned with the efficacy of incentive contracts in the context of uncertainty and argue that they are the 'enemy' for those firms competing based on knowledge creation (Winter et al., 1997; Amabile, 1998). The intuition behind this concern is that accounting measures are incomplete measures of performance and may induce a short-term orientation and possibly even inhibit learning outcomes (e.g., Davila, 2000).[8] Rather than ignoring this literature, we undertake additional analysis to assess the specific types of measures that form part of the incentive contract. Hypothesis 2 is built on the assumption that incentive contracts will rely to a greater extent on aggregated accounting measures when OL is highest as these measures allow managers considerable autonomy and discretion in decision making (Abernethy et al., 2004), and thus *a priori* would fit with a learning context. While it is possible for incentive contracts to include disaggregated measures, these would lower managerial discretion and thus may not be as salient in an OL setting.[9] Disaggregated non-financial measures may be more effective in steering and incentivizing individuals towards specific learning outcomes and behaviors required to achieve those outcomes but would come at a cost of decreasing managers' autonomy.[10] Given that we know little about the types of measures used in an OL context, we complement our test of H2 by

[8] Other research also shows that evaluative pressures that formal evaluation systems may generate negatively affect employee's inclination to experiment, as the system can be perceived to punish failure (e.g., Lee et al 2004).
[9] Abernethy et al. (2013) argue that disaggregated non-financial measures are effective in 'bringing the future forward', but that they are not as effective as aggregated measures.
[10] We acknowledge that subjective measures will also play a role in a learning context but this is beyond the scope of this study (e.g. Gibbs et al., 2004; Hoppe and Moers, 2011).

exploring the nature of performance measures used by firms committed to OL. Our interest is in comparing whether the use of aggregated measures is significantly different from the use of disaggregated measures when OL is high.

Finally, we examine whether particular configurations of OL and control choices have better outcomes. There are two streams of research of relevance to this analysis. First, there is the assumption that firms are in equilibrium, and thus one should expect no differences in firm performance as a result of organizational design choices. However, it is possible to develop more specific expectations about performance outcomes that relate to the particular strategy under examination. Understanding such differences enables us to assess whether control choices add value to the firm (Milgrom and Roberts, 1992; Ittner and Larcker, 2001). Sinkula et al.'s (2007) framework suggests that a commitment to OL will be associated with greater commonality of purpose and agreement on the firm's vision. This should be reinforced by the control choices these firms make. Based on the OL literature we thus expect to observe that firms committed to OL will not only have particular control configurations to support OL, but that they also will have higher learning outcomes as manifested in the creation of a shared understanding of the firm's vision. The literature on OL further argues that a commitment to learning can provide firms with a comparative advantage (Cohen and Levinthal, 1990; Kogut and Zander, 1992; Grant, 1996; Winter et al., 1997). We follow this argument to explore differences in comparative financial outcomes in different OL-control system configurations. We expect that firms committed to OL that select control choices to support this commitment will outperform firms with lower commitment to OL and with inconsistent control choices.

The second relevant literature relates to the notion of equifinality – i.e., that there is no one optimal organization design and that different configurations can provide similar outcomes.

Considering H3, this notion is important from an economic perspective, and we test whether or not the predicted trade-off between incentive contracts and selection evokes different outcomes.

## III. Sample selection, Survey Design and Variable Measurement

### Sample

To test our expectations we collect data from senior managers of manufacturing business units and asked them to reflect on their BU's strategic orientation, its characteristics and the operating environment; the control practices used within the BU for selection of and contracting with lower-level managers.[11] We expect this level of respondent to be particularly knowledgeable about the unit's strategic orientation and control practices and thus to be most qualified to provide valid responses to the survey questions. Using senior managers as informants is also consistent with previous research examining control design choices at the business unit (BU) level (e.g., Abernethy et al., 2004; Bouwens and van Lent, 2007). We take care in the wording of the questionnaire to ensure that our level of theorizing and the analysis are consistent (Luft and Shields, 2003). By seeking responses from BU managers we are able to capture their assessment of the BU's strategic priorities and also how control choices are implemented.

The sample population is drawn from the Kompass Australia database. We select the sample from a diverse range of industries in order to enhance the generalizability of the results. Careful attention is paid to the design and distribution of the questionnaire to increase the reliability and validity of the data. We follow Dillman's (2000) "Tailored Design Method" (TDM) in order to maximize the response rate. We received a total of 188 responses providing a response rate of 22% which we consider a satisfactory response given the level of seniority of this group of

[11] The term "business unit" refers to both single business unit firms and business units of multi-business firms.

managers, with the majority of respondents having the title of CEO, General Manager and Managing Director. Three responses are omitted due to missing data. Table 1 contains information pertaining to responding firms' industry participation.

[Insert Table 1 about here]

We test for non-response bias by performing two tests. The first assesses whether respondents differ from the non-respondents on the demographic variables available in the database. Second, we assess whether there is a significant difference in the mean score on each of the test variables between early and late respondents with the assumption that late responses are a reasonable proxy for non-respondents. Our results (not tabulated) do not support the presence of non-response bias. To minimize the potential for measurement error, particularly common method bias to occur, we employ several design remedies including ensuring respondents that their responses will be treated anonymously, separating each of the test variables quite far apart in the questionnaire, using different response formats, reducing item ambiguity by minimizing the use of ambiguous or unfamiliar terms and using objective measures wherever possible (see Podsakoff, MacKenzie, Lee and Podsakoff, 2003; Tourangeau, Rips and Rasinski, 2000). Statistical procedures included Harman's (1967) one-factor test and confirmatory tests to identify potential common method bias.

**Variable measurement**

The questionnaire includes one or more items to measure each of the variables included in this study. The scales used to measure all variables are based as closely as possible on prior empirical research. To overcome some of the measurement concerns associated with survey research (see Ittner and Larcker, 2001; Luft and Shields, 2003), we took several steps to reduce measurement error and to demonstrate construct validity. First, we checked carefully that the

respondents in our sample were at the appropriate level of management for the theory that we test (i.e., senior management of a BU reflecting on control choices within their BU). For this purpose, we contacted each respondent by telephone to check that they held the position as indicated in the directory. Second, we use objective measures where possible as these are less susceptible to measurement error (Ittner and Larcker, 2001; Abernethy et al., 2004). For variables where perceptual scales are needed for measurement, we use additional measures to assess scale validity. Appendix 1 reports all items used for measurement of test and control variables, and for validity tests.

**Key variables of interest**

*Organizational learning (OL)*. We measure a specific notion of strategy (e.g., Ittner and Larcker, 2001), namely the extent to which the firm is committed to learning as a strategic priority. Based on Sinkula et al. (1997), we use four items that reflect the extent to which (1) the ability to learn is key to the firm's competitive advantage, (2) the BU's basic values include learning as a key to improvement, (3) employee learning is considered an investment and not a cost, and (4) learning in the BU is seen as essential to guarantee organizational survival ($\alpha$=0.80).[12] We assess the validity of the measurement scale in two ways. First, we correlate it with an objective measure of the amount spent in the prior year on employee development activities (e.g., training, courses, seminars) expressed as percentage of total sales. The positive and significant correlation that we obtain ($r$=0.23; $p$<0.01) is consistent with an emphasis on OL leading to greater investments in learning, supporting adequate predictive validity. Second, we correlate the OL construct with an item reflecting the importance for the BU to build a reputation

[12] Sinkula et al. (1997) use these items to measure the construct "commitment to learning" as a key element of a firm's learning orientation.

of being the first in the industry to try new methods and technologies. The positive and significant correlation ($r$=0.15; $p$<0.05) again supports adequate criterion-related validity.

*Selection* is measured by three items using an adaptation of the Snell (1992) instrument. These items capture the intensity of selection processes used to attract and hire the right type of individuals through: (1) the establishment of enhanced staffing procedures, (2) the intensity of evaluation before hiring, and (3) the extent to which pride is taken in hiring the best people for a job (α=0.71). Jointly, these items reflect the intensity of recruitment, evaluation of potential employees and the outcome of the selection process to ensure that individuals selected adequately fit the organization and the job they are hired for. Importantly, the items reflect both the *investment* in selection processes that is expected to vary with commitment to OL and the extent of incentive contracting (cf. Prendergast 2011), as well as the *effectiveness* of the selection process (i.e. 'hiring the best people for a job').

We test validity of the selection scale by correlating it with the average education level of the senior management team (SMT). In a different part of the questionnaire we measured the education attained by each SMT member.[13] We sum the score for the SMT to obtain an average SMT member education-level score, and use this as proxy of the effectiveness of selection processes in appointing highly trained and expert managers. We assess convergent validity by testing if selection is positively associated with the SMT's mean education level. The correlation between selection and SMT education is positive and significant ($r$=0.17; $p$<.05), and the relationship holds regardless of the number of individuals included in the SMT.

*Incentive contracting* is measured by five items that reflect both the use of output measures to evaluate lower-level managers and the extent to which their compensation is determined based on performance. We combine measurement instruments of Slater and Olson (2000) and Snell

[13] The measurement distinguished six completed education levels from 'High school' (1) to 'Post-graduate' (6).

(1992) to capture both perceptual information about extent of use of performance-based evaluation and objective information about incentive intensity. First, respondents indicate the extent to which (1) managers in the BU are evaluated on results, (2) performance targets of BU managers are important, (3) evaluations are made relative to pre-established targets, and (4) performance is judged by results (Snell, 1992). A higher score on these items indicates that the firm uses output measures more intensively for performance evaluation. In a later part of the questionnaire (with three pages of questions in between), respondents indicated the incentive intensity by noting the approximate percentage of total compensation that is performance-based. On the measurement scale, the value of 1 reflects 0% incentive compensation, the value 2 reflects 1% to 10%, and every subsequent scale increment reflects a 10% increase, with the value 8 reflecting over 60%. Because only a few observations populate the categories 6, 7 and 8, creating significant kurtosis, we combined these into the category 6, representing incentive compensation of 41% and more. The correlations between the five items are highly significant and the measurement scale can be considered reliable ($\alpha$=0.81). Since we argue that incentive contracting supports employee attraction and retention, we use a measure of the percent of employee turnover for a test of predictive validity. This measure correlates negatively with our measure of incentive contracting ($r$= -0.19; $p$<0.05), consistent with the argument that incentive contracts support retention of employees (Banker et al., 2001).

In addition to measuring the use of incentive contracting, we also capture the *types of performance measures* included in managers' incentive contracts to be able to test the assertion that firms committed to OL will rely more on aggregated performance measures. Following prior research we ask respondents to indicate the percentage weight (0%-100%) placed on a range of measures that capture financial and non-financial performance, and differ in their level of

aggregation (Abernethy et al., 2004; Bouwens and van Lent, 2007). These measures include stock-price related measures; non-financial measures (market share, customer satisfaction, quality); profit-measures (e.g., profit margin, income, gross margin to sales); return measures (e.g., ROI, RONA, RI, EVA, CFROI) and disaggregated financial measures (revenue and cost measures).[14]

*Organizational outcomes.* We measure three outcomes that relate to an OL strategy, namely shared vision, innovation outcomes and financial performance. We use an adapted version of the Sinkula et al. (1997) instrument to capture the extent to which there is a shared vision within and across business units of the business unit's strategy. The instrument asks respondents to indicate the extent to which (1) there is commonality of purpose in the BU, (2) there is agreement on the BU's vision across levels and departments; (3) the BU has a high level of understanding about key business issues.[15] Maximum likelihood factor analysis shows the items are reflective of one factor, with all items loadings above 0.80 and adequate reliability ($\alpha$=0.87). We test construct validity of the measure in two ways. First, we correlate it with an item that assesses the outcome of shared vision, namely, whether "our shared understanding of business unit issues supports the development of new ideas". The correlation is positive and significant ($r$=0.45; $p$<0.01). Second, we correlate it with an 8-item construct ($\alpha$=0.93) capturing the degree of friction within the firms' senior management team. Consistent with the idea that friction will limit the development of a shared vision within the firm, the measures correlate negatively and significantly ($r$= -0.32; $p$<0.01).

[14] Only a small percentage (19%) reported the use of stock prices creating significant concerns about normality. We thus replace the present score by a dummy measure to reflect whether they were used (1) or not (0).

[15] In order to capture shared vision with respect to OL, the items were introduced by asking respondents explicitly to think about the relevance of learning processes to the BU. The items for measuring OL were placed at the beginning of the questionnaire, and the items for shared vision several pages later, with an extensive set of other measurement items placed in between, to avoid respondents answering these questions in direct sequence.

We measure innovation performance based on Li and Atuahene-Gima (2002) with four items that capture the extent to which the firm outperforms its major competitor in terms of innovation. Respondents indicated how much the BU in the past three years, as compared to the firm's major competitor, placed emphasis on new product development, developed a variety of new products or changes to existing products, increased the rate of new product introductions and increased its overall commitment to develop and market new products ($\alpha$=0.91). As part of our attempt to minimize respondent bias, the scale was reversed with a low score reflecting higher performance. For interpretation, we reverse the scale to make a higher score reflect increasing performance relative to the major competitor. We conduct multiple validity tests. First, we correlate it with measures of the BU's percent market share in the industry and percent change in market share over the past year. The positive correlations ($r$=0.22; $p$<0.01, and $r$=0.15; $p$<0.05) support the idea that innovation has a comparative advantage in growing market share. Second, we correlate it with a measure of percent change in customer retention relative to competitors. The correlation ($r$=0.34; $p$<0.01) supports that innovation enables the firm to retain customers. Finally, the measure correlates positively ($r$=0.16; $p$<0.05) with an item about the extent to which new insights and ideas get developed into improved products and services, supporting criterion-related validity.

We assess financial performance in two ways: (1) asking respondents to assess their BU's financial performance relative to competitors over the past year, and (2) asking about their changes in financial performance over the past year. For performance relative to competitors, we use a 7-point scale with the middle (4) indicating 'about the same', and each one-point increment (decrease) reflects worse (better) performance of up to 10% (with 1 and 7 reflecting more than 20% better or worse). For change in performance as compared to last year, we capture (a) the

percent change in profit over the last year, and (b) the percent change in return on investment over the last year. Both items use a 7-point scale with the middle (4) indicating 'relatively constant' and each 1-point increment (decrease) reflecting increases (decreases) of up to 5% (with 1 and 7 reflecting a decrease and increase of more than 10%). The first item was reverse-scaled to examine any potential effects of respondent bias. Consistent with the absence of such bias, we find that the measure correlates significantly negative with the other two items ($r$=-0.57 and -0.58, respectively, with both $p$<0.01). The three performance measures reflect one factor with high factor loadings (α=0.85).

**Control variables**

To minimize the potential for bias in estimates as a result of omitted variables, we control for several variables known to relate to firms' strategic orientation and control choices, namely, delegation, two proxies to capture contracting difficulty, BU size and industry. Delegation is controlled as it has been shown to influence control system choice (Campbell, 2012; Abernethy et al., 2004, 2012). We measure *Delegation* by an indicator variable that reflects senior management's choice to closely monitor decisions and actions of lower level managers on an ongoing basis (low delegation, taking the value 0), or to delegate decision rights and hold managers accountable for their decisions (high delegation, taking the value 1) (cf. Govindarajan and Fisher, 1990). We use Jaworski and Kohli's (1993) market turbulence instrument as a proxy for contracting difficulty. Four items capture the extent to which customer preferences and needs change over time, and of changes in the customer pool with new customers having different demands than existing customers (α=0.73).[16] We also include Jaworski and Kohli's (1993)

[16] While the Jaworski and Kohli's (1993) scale includes five items, and for these items we obtain a similar Cronbach Alpha as in their study (0.70 vs 0.68), the confirmatory factor analysis that we conduct later shows one item loads only weakly on the construct, and accordingly we drop this from the analyses. Results are similar if we retain it.

instrument of *Competition* as a second proxy for contracting difficulty. Four items capture the intensity of competition in the BU's market, reflected by the degree of price competition, promotion wars, competitive moves, and a general assessment of the intensity of competition ($\alpha$=0.74). Since market turbulence and competition reduce managers' controllability, increase noise and thus increase contracting difficulties and costs, they should relate negatively to the use of incentive contracting (Bloom and Milkovic, 1998), and change the relative preference between selection and incentive contracting (Prendergast, 2011). In addition, these measures are likely to correlate with firms' strategic orientation, and thus control for external influences that may affect the relation between OL and control choices. *Size*, measured by the log of the number of full-time employees in the BU, is included as control variable as this may relate to both strategy and control system design.[17] Finally, while we deliberately sample only manufacturing firms, in additional analyses we examine whether the sub-industry affects the results. Table 2 reports descriptive statistics for all variables that we use in our model.

To examine the potential presence of common method bias, we conduct Harman's (1967) one-factor test in which we include the items of all multi-item scales included in Table 2 (as discussed later, we also use confirmatory analysis to test for this). The results of this test do not suggest any major concerns about common rater bias as it provides six factors, with the first not explaining more than 22% of the variance (total variance explained 64%). The items associated with each measure load on the expected factor. The results are the same when also including the single items for delegation and BU size, which both have insignificant loadings on all factors.

[Insert Table 2 about here]

[17] We also collected size data from companies' annual reports. Total sales correlates strongly with log(employees) ($r$=0.90, $p$<0.01), and using this measure instead does not appreciably affect our findings.

## IV. RESULTS

### Correlation results

The Pearson correlations in Table 3 provide initial evidence on the expected relations between the test variables and those included as control variables. OL correlates positively and significantly with both employee selection and incentive contracting. These control choices also correlate positively and significantly with each other, although a bivariate test is insufficient to draw conclusions about the absence of a substitutive effect as hypothesized in H3. The magnitude of correlations between the control and independent variables provide no concerns about potential multicollinearity, and their associations with the dependent variables indicate they are important to control for them in the multivariate analyses.

[Insert Table 3 about here]

### Model Analyses and Results

We use two empirical approaches to test our hypotheses. First, to test our base model we employ structural equation modeling (SEM). This analysis allows us to test H1 and H2 while controlling for a range of other variables, including BU size and the proxies for contracting difficulty. In addition, it allows us to test the relation between selection and incentive contracting in an unconstrained model where firms vary in their commitment to OL.

Second, we use cluster analysis to identify whether the data include multiple clusters of firms with different commitment to OL and differential use of selection and incentive contracting. Cluster analysis is particularly useful as it allows us to more fully utilize our data by going beyond the assessment of how firms 'on average' make control choices in response to OL. Cluster analysis in some sense poses less restrictions on our data and allows the data to 'do the talking'. Our expectation is that if a trade-off between selection and incentive contracting exists,

cluster analysis will enable us to identity clusters with high commitment to OL, but with differential emphasis on selection and incentive contracting (cf. H3). Given the presence of these clusters, we can then extend our base model to assess whether our control choices are subjects. We can regress within the high OL clusters, intensity of selection on use of incentive contracting and the control variables, to test whether this substitutive relation is significant. Following Prendergast's (2011) model, firms in a cluster with relatively greater emphasis on incentive contracting should face less contracting difficulties compared to those firms with relatively greater emphasis on selection and greater contracting difficulties. We proxy for contracting difficulties using the measures of competition and market turbulence and examine whether differences in these proxies across clusters are consistent with this expectation.

Subsequently, we contrast the clusters with high commitment to OL with firms with less commitment to OL where the use of both selection and incentive contracting should be lower. This contrast thus can empirically reconcile why commitment to OL can on the one hand induce greater use of both selection and incentive contracting (H1 and H2), and on the other hand operate as substitutes in firms highly committed to OL (H3). We also use this contrast to test whether the incentive contracts of managers in firms committed to OL rely to a greater extent on aggregated performance measures compared to disaggregated measures. Finally, we use the cluster analysis outcomes to assess if there are performance differences between clusters (i.e., in shared vision, innovation and financial performance), which allows us to speak to the questions whether (1) alternative 'theory-consistent' configurations of selection and incentive contracting provide similar performance levels (i.e., are equifinal, cf. Gresov and Drazin, 1997), while (2) configurations that are not 'theory-consistent' (e.g., high commitment to OL but low emphasis on selection and incentive contracting) have weaker performance.

**Structural equation model estimations**

We use LISREL 8.80 to estimate the structural equation models (Jöreskog and Sörbom, 1999). SEM allows us to simultaneously estimate the effects of the exogenous variables (OL and control variables) on intensity of selection and incentive contracting, and to estimate their interrelation. One other benefit of SEM is the ability to simultaneously estimate the structural model (SM) and measurement model (MM) and to separate error variance from 'true variance'. The SM assesses how the constructs relate to each other; while the MM relates the measurement items to the construct. We use maximum likelihood estimation, as this is appropriate for our sample size and variable properties and distributions (Boomsma and Hoogland, 2001). As a sensitivity test, we also estimate the SM using factor scores instead of specifying a MM, and find that the SM parameter estimates are very similar, while the reduced model results in better fit statistics. These results alleviate concerns that the SM estimates are influenced by the inclusion and estimation of an elaborate MM. Following Hu and Bentler (1999), we use a combination of fit statistics to evaluate how well the estimated models fit the sample data, and to increase the probability of rejecting 'false' models and not rejecting 'true' models.[18]

***Measurement model results***

In order to identify the scales of multiple indicator constructs, the loading of the indicator that was expected *a priori* to best represent the construct is fixed at a value of one.[19] Table 2 reports the results for the MM (which specifies covariances between all constructs). The fit

[18] The goodness-of-fit index (GFI), standardized root mean residual (SRMR), and root mean squared error of approximation (RMSEA) indicate how well a model reproduces the sample data. In addition, the non-normed fit index (NNFI) and comparative fit index (CFI) compare the discrepancies from a null-model and the fitted model, to assess improvement in fit. Recommended cutoff values are 0.06 for RMSEA, 0.08 for SRMR and 0.95 for GFI, NNFI and CFI, with loosened values for combinations of measures (Hu and Bentler, 1999).

[19] Since measurement error can only be estimated for multiple-indicator constructs, we fix measurement error for delegation and firm size, which have just one indicator by specifying an expected error variance of the indicator (Jöreskog and Sörbom, 1999). Specifically, we fix their error variance at 0.20 times their estimated total variance.

statistics are adequate and jointly indicate a good fit between model and sample data. Similarly, the factor loadings are highly significant and the standardized loadings ($\lambda$s) are satisfactory, indicating adequate MMs for all constructs.

We further evaluate the MM by comparison it with alternative MMs that: (1) specify selection and incentive compensation as one factor (i.e., 'control intensity'), and (2) specify one common factor for all indicators (i.e., common method bias). Fit of these models is substantially less, supporting the reported MM and alleviating concerns about common method bias.

***Structural model results***

In the evaluation of the SM estimates, we first examine the direct effects of OL on the two control choices and then examine if, conditional on the influence of OL, there is a relation between selection and incentive contracting. Accordingly, we first estimate a model with selection and incentive contracting as dependent variables, and then estimate a second model that additionally specifies a path between selection and incentive contracting to capture their interrelationship. As selection normally precedes contract design, we specify the direction of the relationship from selection to incentive contracting.[20]

Table 4 reports the parameter estimates and fit statistics for both models. The fit statistics individually and in combination indicate that the models reproduce the sample data well. The fit statistics for the SMs with factor scores instead of MM (not tabulated) are more favorable than reported above, reinforcing this conclusion. Examining the difference in fit between the models shows that model 2 provides a significant improvement in fit, supporting the presence of a relation between selection and incentive contracting as a joint response to OL. We first interpret

[20] Using the example of the appointment of a University Dean, selection occurs first and then the contract is written.

the coefficients for Model 1 and then do this for Model 2, which shows that selection significantly mediates the effect of OL on incentive contracting.

[Insert Table 4 about here]

The coefficient estimates for Model 1 in Panel A show that OL is positively and significantly related with both selection and incentive contracting, providing support for H1 and H2 that firms pursuing OL make greater investments in employee selection and in incentive contracting in order to 'get the right people' and provide them with greater incentives based on performance achievements. The estimates further show that increased delegation is associated with more intensive selection processes and incentive contracting. As expected, more intensive competition is associated with reduced use of both selection and incentive contracting, while greater uncertainty originating from market turbulence is associated with greater selection, suggesting that firms put more effort into selection processes to cope with uncertainty. Finally, larger firms make more use of incentive contracts, consistent with prior findings that larger firms use more formal controls.

Model 2 adds the path between selection and incentive contracting, which results in a significant improvement in model fit. Once we allow for the two control choices to be interrelated, the direct effect of OL on incentive contracting becomes insignificant. The total effect, however, is highly significant, which provides evidence that the effect of OL on use of incentive contracting is fully mediated by the selection processes used to attract and hire employees. Indeed, the estimated indirect effect of OL on incentive contracting is positive and highly significant (0.28, $p<0.01$, not tabulated). Thus, while we find evidence for both H1 and

H2, the results also support that employee selection processes and incentive contracting are interrelated choices in supporting increasing commitment to OL.[21]

To ensure that firms' sub-industry membership does not affect the results we repeat these analyses with 7 sub-industry dummies. Since the use of a too large number of dummy variables causes estimation problems in SEM, we instead estimate a set of OLS regressions. Results with and without the indicators are very similar to the reported LISREL results.

**Cluster analysis results**

We use cluster analysis to identify whether the data include multiple clusters of firms with different commitment to OL and differential use of selection and incentive contracting. Cluster analysis allows us to answer three questions: (1) is there a trade-off between selection and incentive contracting? (2) which types of performance measures firms are used by firms with differential commitment to OL? and (3) and are there performance differences between firms with different OL and control choice configurations?

We used a two-step cluster analysis (Hair et al., 1998; Ketchen and Shook, 1996) to identify groups of firms with consistency in their scores on OL, selection and incentive contracting. First, we conduct hierarchical cluster analysis using Ward's method (an agglomerative technique that indicates the number of clusters present in the data) and squared Euclidean distance. Based on inspection of the dendogram and agglomeration coefficients, this analysis suggests a clear four-cluster solution. Next, we use the centroid values of this hierarchical analysis as 'seed points' for a K-means cluster analysis, which is a divisive technique. This second analysis provides a second opinion on the appropriate number of clusters by breaking down rather than (as in Ward's

[21] If we specify a covariance between selection and incentive contracting (i.e., not assuming causal order), we obtain significant direct effects of OL on both control choices (both $p<0.01$), and the covariance between both mechanisms is also positive and significant (0.37; $t=3.91$, $p<0.01$). This indicates that also after controlling for OL and the other control variables, the control choices remain positively associated.

method) building up the clusters. This again provides evidence of a four-cluster solution, with the degree of agreement between the two resulting cluster solutions reaching 81 percent. Results of the cluster analysis with final cluster centres are presented in Table 5, Panel A. The mean differences of the variables that entered the analysis are significant (for all ANOVAs $p<0.01$).

[Insert Table 5 about here]

To ease interpretation, for all constructs we compute mean scores across the items. The cluster results show that Clusters 1 and 2 have a high average commitment to OL, Cluster 3 slightly less, and Cluster 4 places substantially less emphasis on OL. Consistent with the SEM estimates, the results show that the two clusters with the highest emphasis on OL (Cluster 1 and 2) also have the highest average in their use of employee selection processes and incentive contracting. Cluster 1, however, places greater emphasis on selection (5.35 vs 4.55; $p<0.01$) and Cluster 2 makes greater use of incentive contracting (4.56 vs 5.54; $p<0.01$).[22] Both clusters score highest on both shared vision and financial performance (which differ significantly at $p<0.01$ across the four clusters, but do not differ significantly between Cluster 1 and 2). They also score highest and similarly on innovation performance, and while the F-test (contrasting the 4 clusters) is insignificant, a t-test comparing Clusters 1 and 2 with Clusters 3 and 4 is significant ($p=0.07$). These results on the performance variables are consistent with the notion of equifinality; firms with a same dominant demand function (OL) use alternative control designs to obtain the same performance outcomes (Gresov and Drazin, 1997). Turning our attention to Cluster 3, we observe significantly less use of both selection processes and incentive contracting, despite the high commitment to OL, which is only slightly less than in Clusters 1 and 2. This cluster has a significant lower mean on shared vision, innovation and financial performance, suggesting a

[22] Consistent with these differences, a relative measure of the average item score for incentive contracting divided by the average item score for the selection items, also differs significantly between Cluster 1 and 2 ($p<0.01$).

'misfit' between the control requirements that the commitment to OL generates, and the relatively low use of selection and incentive contracting. Thus, while Clusters 1 and 2 provide evidence of 'theory-consistent' control design (albeit with a trade-off between selection and incentive contracting), Cluster 3 appears to include theory-inconsistent control design with lower comparative performance outcomes.

Cluster 4, finally, provides low emphasis on both selection and incentive contracting, in line with the low commitment to OL, and consistent with the earlier SEM results. Performance, however, is also lower than in Clusters 1 and 2. While this difference cannot be attributed to misfit between OL and control choices, it is consistent with the notion that greater commitment to learning can provide greater comparative performance in itself (Sinkula et al., 1997; Cohen and Levinthal, 1990; Kogut and Zander, 1992).

**Evidence on the trade-off between selection and incentive contracting**

In order to appropriately test H3 that selection and incentive contracting act as substitutes, we need to construct a test that closely matches the implicit assumptions in the Prendergast (2011) model on similarity of the objective function and performance across firms. In our empirical setting, we thus must meet the following two conditions:

1. Differences in the key antecedent variable that drives both control choices (i.e., OL) are minimized. This allows us to test the hypothesis that when commitment to OL is high (inducing firms to invest in both controls), firms make a trade-off between both controls.
2. Performance differences between firms are minimized, in order to mitigate concerns that firms included in the test have suboptimal control choices that weaken their performance. This fits the assumption of Prendergast's (2011) model of equilibrium choices.

We select all cases included in Clusters 1 and 2, which most closely match these conditions as they do not differ significantly in emphasis in OL, nor in performance. This provides a sample of 100 observations. We specify a regression model with incentive contracting as the dependent variable, and selection and all control variables, as independent variables (including OL to account for any remaining variation in OL within the clusters). Table 6 presents the results.

[Insert Table 6 about here]

Consistent with H3, selection has a significant and negative coefficient ($p<0.05$).[23] Thus, while the use of both controls increases and are positively interrelated when commitment to OL increases, their association turns negative when the analysis is constrained to high OL firms.[24] This is consistent with arguments that, for a given objective, firms make a trade-off between selection and incentive contracting (Campbell, 2012; Prendergast, 2011). Prendergast argues that the existence of this trade-off relates to the difficulty to contract on output, which increases the costs of incentive contracting and makes investing in selection *relatively* less costly. It follows that firms facing relatively more (less) contracting difficulties will invest relatively more (less) in selection and less (more) in incentive contracting. Although we lack direct measures of firms' difficulty to contract on output, we have two proxies for conditions that would, *a priori* generate contracting difficulty – competition and market turbulence. Comparing Cluster 1 (where selection is relatively more important) and Cluster 2 (where incentive contracting is relatively more important) provides results that are consistent with the expectation. In particular, Cluster 1 scores significantly higher on competition (4.77 vs. 4.26; $p=0.02$) and market turbulence (4.08 vs. 3.72; $p=0.08$). Thus, for both proxies the results support that a greater difficulty to contract on output moves firms' trade-off in favour of a relatively greater intensity of selection.

[23] If we instead of regression analysis compute a partial correlation between selection and incentive contracting (assuming no causality), including the same control variables, this also is negative and significant ($r=0.24$; $p<0.05$).
[24] Repeating this analysis for Clusters 3 and 4 provides a positive and insignificant coefficient for Selection.

**Types of performance measures for incentive contracting**

In the theory section we develop the argument that firms committed to OL will not only rely to a greater extent on incentive contracting, but will also make greater use of aggregated performance measures in managers' incentive contracts. In particular, we expect firms committed to OL to make relatively greater use of aggregated performance measures (which we capture as the sum of the weights on stock, return and profit measures) relative to disaggregated measures as these measures provide the autonomy that is necessary in a learning context. Based on the cluster results, we expect that firms committed to OL and make theory-consistent incentive contracting choices (i.e., Clusters 1 and 2) will rely significantly more on aggregated financial measures and less on both financial and non-financial disaggregated measures. Our results indicate that this is the case.[25] In particular Cluster 2 (where incentive contracting is highest), relies strongly on aggregated measures and only a limited amount on disaggregated financial measures. In the theory-inconsistent Cluster 3 the reliance on aggregated measures is lower and on disaggregated financial measures higher (both $p<0.01$ when compared against Clusters 1 and 2).[26] Overall, these results are supportive of prior research that argues that disaggregated measures can be too specific and constrain the autonomy of managers which we argue is important in a learning environment.

[Insert Table 7 about here]

[25] Examining the three components of aggregated financial measures, the main differences are found in reliance on return and stock measures which is not surprising given that these measures capture long-term value to a greater extent than profit (Abernethy et al. 2013).

[26] We do not make predictions for Cluster 4 given that OL is not a priority and it is entirely possible that their choice of performance measures is related to other strategic priorities not captured in this study.

## VI. CONCLUSION, LIMITATIONS AND FUTURE RESEARCH

Our study examines the design of control systems in a context where serious doubts have been raised about the relevance of incentive contracting in firms committed to learning. In contrast to arguments that would suggest a diminishing role for incentive contracts, our results provide a different conclusion. A commitment to learning is associated with greater emphasis on incentive contracting. We provide empirical evidence that supports recent findings of Campbell (2012) and theoretical predictions of Prendergast (2011) that employee selection increases in importance in a context where contracting on outputs is difficult. However, we also find that managers will make a trade-off when commitment to OL is high such that when contracting difficulties increase, selection will be used to a greater extent than incentive contracting. That is not to say that incentive contracting will not be used as it continues to play an important role by providing motivation and reinforcing selection processes in attracting and retaining employees, but it is used to a lesser extent than when contracting on output is easier. We also find evidence that firms committed to learning differ in their use of performance measures in the incentive contract. Specifically, our results support the conclusion that these firms select measures that are consistent with the objective of OL, namely aggregated measures that allow managers sufficient discretion to make cost-benefit trade-offs in managing their business unit. Finally, our results support that theory-consistent control choices (i.e. 'fit') are associated with higher performance on measures of shared vision, innovation and financial performance, with different trade-offs between selection and incentive contracting (i.e., different control designs) showing equifinality.

Our study is subject to several limitations. First, in testing hypotheses using survey data researchers are cautioned to ensure that potential for bias is limited. It is however impossible to increase our understanding of management control practices unless we seek information from

firms themselves. Given the importance of matching our theory and level of analysis, our best option was to seek detailed information about the firm's commitment to learning and its control practices from business unit managers (cf. Luft and Shields, 2003). In addition, we sampled only high level managers who we expect to be well informed about the issues covered by the survey instrument. We also undertake a number of steps to ensure that the survey measures used are valid and reliable and to minimize the incidence of common method bias. We use pretested measurement instruments where possible, assess construct validity of each test variable using alternative objective measures and for each variable show adequate psychometric properties. Second, as with any cross-sectional design, we cannot fully rule out concerns about endogeneity and the direction of causality between variables. Third, it is possible that firms use other control mechanisms and processes to support their commitment to OL. Identifying such mechanisms and processes, and modeling their interrelations with other control choices, is an important direction for future research. Four, in our test of the trade-off between selection and incentive contracting, we rely on two proxies of firms' difficulty to contract on output. While the evidence supports the expectations, future research may collect more direct measures of firms' contracting difficulties, as this is the key variable theorized to cause the trade-off.

Despite these limitations, this study provides insight into how firms committed to organizational learning benefit from both investing in employee selection and incentive contracting and how they make trade-offs between these choices to effectively embed this commitment into the hearts and minds of their managers. The implications for senior management designing their human resource management strategies to stimulate OL follow from these findings.

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**Table 1 – Respondents by Industry (n=185)**

| | No of respondents |
|---|---|
| Food, Beverage and Tobacco | 32 |
| Textile, Leather and Apparel | 14 |
| Wood, Paper and Printing | 19 |
| Petroleum, Chemical, Plastic and Mineral | 43 |
| Equipment and Machinery | 29 |
| Primary and Fabricated Metal | 23 |
| Computer, Electronic and Electrical Equipment | 25 |

**Table 2 Descriptive statistics and measurement model estimates (N=185)**

| | *Descriptive statistics* | | | | | | *MM estimates*[#] | | |
|---|---|---|---|---|---|---|---|---|---|
| | *Min* | *Max* | *Mean* | *s.d.* | *Skew* | *Kurt* | $\lambda$ | *t value* | $\lambda^s$ |
| **Endogenous variables** | | | | | | | | | |
| *Selection (α=0.71)* | | | | | | | | | |
| staffing procedures | 1 | 7 | 4.01 | 1.38 | -0.17 | -0.47 | 1.01 | 6.65 | 0.64 |
| evaluation# | 1 | 7 | 4.42 | 1.57 | -0.34 | -0.71 | 1.26 | 7.00 | 0.70 |
| hiring the best people | 1 | 7 | 4.55 | 1.28 | -0.14 | -0.36 | 1.00 | - | 0.68 |
| *Incentive contracting (α=0.81)* | | | | | | | | | |
| percentage bonus pay | 1 | 6 | 2.51 | 1.36 | 0.96 | 0.41 | 0.49 | 6.34 | 0.46 |
| evaluated on results | 1 | 7 | 5.24 | 1.35 | -1.12 | 1.35 | 0.82 | 12.54 | 0.79 |
| importance of performance targets | 1 | 7 | 4.41 | 1.63 | -0.39 | -0.72 | 0.95 | 11.64 | 0.74 |
| evaluated on pre-established targets# | 1 | 7 | 5.04 | 1.40 | -0.99 | 0.72 | 1.00 | - | 0.91 |
| performance judged by results | 1 | 7 | 4.61 | 1.51 | -0.62 | -0.28 | 0.60 | 7.03 | 0.50 |
| **Exogenous variables** | | | | | | | | | |
| *Organizational learning (OL) (α=0.74)* | | | | | | | | | |
| learning key to comp. advantage | 1 | 7 | 5.53 | 1.10 | -1.11 | 1.87 | 0.56 | 5.76 | 0.45 |
| learning key to improvement# | 1 | 7 | 5.21 | 1.13 | -0.83 | 1.14 | 1.00 | - | 0.77 |
| learning investment not a cost | 1 | 7 | 5.04 | 1.22 | -0.57 | 0.41 | 1.16 | 10.44 | 0.82 |
| learning to guarantee survival | 1 | 7 | 5.09 | 1.17 | -0.68 | 0.94 | 1.08 | 10.32 | 0.80 |
| *Delegation* | | | | | | | | | |
| approach to managing the BU | 0 | 1 | 0.78 | - | - | - | 1.00 | - | 0.95 |
| *Competition (α=0.74)* | | | | | | | | | |
| intensity of competition# | 1 | 7 | 5.31 | 1.31 | -0.56 | -0.43 | 1.00 | - | 0.74 |
| promotion wars | 1 | 7 | 3.90 | 1.82 | 0.09 | -1.08 | 0.92 | 5.66 | 0.50 |
| degree of price competition | 1 | 7 | 5.03 | 1.53 | -0.61 | -0.52 | 1.11 | 7.36 | 0.70 |
| competitive moves | 1 | 7 | 4.38 | 1.43 | -0.34 | -0.56 | 0.90 | 6.72 | 0.61 |
| *Market turbulence (α=0.73)* | | | | | | | | | |
| change in customer preferences# | 1 | 7 | 4.20 | 1.56 | -0.27 | -0.73 | 1.00 | - | 0.87 |
| customers look for new products | 1 | 7 | 4.43 | 1.47 | -0.25 | -0.43 | 0.77 | 8.11 | 0.71 |
| demand from new customers | 1 | 7 | 3.80 | 1.43 | -0.05 | -0.79 | 0.39 | 4.63 | 0.38 |
| new customers with different needs | 1 | 7 | 3.71 | 1.43 | 0.14 | -0.40 | 0.58 | 6.71 | 0.55 |
| same customers as in past (reverse)[§] | 1 | 7 | 3.19 | 1.40 | 0.39 | -0.39 | - | - | - |
| *Size* | | | | | | | | | |
| log(number of employees in BU) | 1 | 3.78 | 2.43 | 0.49 | -0.26 | 0.64 | 1.00 | - | 1.00 |

All items are measured on a 7-point Likert scale (1=*strongly disagree*; 7= *strongly agree*) unless noted otherwise. In the measurement model estimation, covariances are specified among all constructs. GOF statistics: $\chi^2$=317.24 (df=190; $p$<0.01); RMSEA=0.054; SRMR=0.065; GFI=0.87; NNFI=0.92; CFI=0.93.

[#] Reference indicators to identify multi-item constructs are denoted by # (i.e., λ=1).

§ Item deleted from the measurement scale because of a low factor loading.

**Table 3 Correlations between the SEM model constructs (N=185)**

| | Org. learning | Selection | Incentive contr. | Deleg. | Comp. | Market turb. | BU Size |
|---|---|---|---|---|---|---|---|
| Org. learning | *0.80* | | | | | | |
| Selection | 0.33*** | *0.71* | | | | | |
| Incentive contr. | 0.23*** | 0.38*** | *0.81* | | | | |
| Delegation | 0.11 | 0.24*** | 0.33*** | - | | | |
| Competition | -0.17** | -0.22*** | -0.23*** | -0.07 | *0.74* | | |
| Market turb. | -0.05 | 0.10 | -0.15 | 0.10 | 0.27*** | *0.73* | |
| BU Size | 0.08 | 0.08 | 0.18** | -0.06 | -0.04 | -0.05 | - |

Cronbach alpha for all multi-item constructs on diagonal (in italics); Pearson correlations below diagonal.

*** and ** indicate a p value ≤ 0.01 and 0.05 (two-tailed).

**Table 4 Structural model estimates (N=185)**

***Direct and total effects of Organizational Learning on Selection and Incentive Contracting***

| | *Model 1* | | *Model 2* | |
|---|---|---|---|---|
| | *Selection* | *Incentive contracting* | *Selection* | *Incentive contracting* |
| *Direct effects* | | | | |
| *OL* | 0.39<br>3.96*** | 0.37<br>3.08*** | 0.38<br>3.89*** | 0.07<br>0.50 |
| *Delegation* | 0.55<br>2.83*** | 0.99<br>4.03*** | 0.54<br>2.77*** | 0.59<br>2.35** |
| *Competition* | -0.28<br>-2.82*** | -0.25<br>-2.04** | -0.24<br>-2.45** | -0.02<br>-0.19 |
| *Market turbulence* | 0.12<br>1.87* | -0.02<br>-0.19 | 0.10<br>1.51 | -0.12<br>-0.40 |
| *Size* | 0.10<br>0.73 | 0.41<br>2.25** | 0.14<br>0.97 | 0.33<br>1.85* |
| *Selection* | -- | -- | -- | 0.72<br>4.16*** |
| *Total effects* | | | | |
| *OL* | -- | -- | -- | 0.34<br>2.84*** |
| *Delegation* | -- | -- | -- | 0.98<br>3.94*** |
| *Competition* | -- | -- | -- | -0.20<br>-1.59 |
| *Market turbulence* | -- | -- | -- | -0.04<br>-0.54 |
| *Size* | -- | -- | -- | 0.43<br>2.31** |
| $R^2$ | *0.36* | *0.27* | *0.33* | *0.41* |

Goodness of fit statistics Model 1: *df*=191, $\chi^2$=337.44 (*p*<0.01), *RMSEA*=0.058, *SRMR*=0.073, *GFI*=0.87, *CFI*=0.92, *NNFI*=0.91. Goodness of fit statistics Model 2: *df=190*, $\chi^2$=317.24 (*p*<0.01), *RMSEA*=0.054, *SRMR*=0.065, *GFI*=0.87, *CFI*=0.93, *NNFI*=0.92. Each cell reports the coefficient estimate and *t*-value (***, **, * indicate a *p* value < 0.01, 0.05 and .10; two-tailed).

**Table 5 Cluster analysis results**

| | Panel A – Cluster Analysis Variables | | | Panel B – Outcome Variables* | | |
|---|---|---|---|---|---|---|
| | OL | Selection | Incentive contracting | Shared vision | Innovation performance | Financial performance |
| Cluster 1 (N = 57) | 5.61 (0.64) | 5.35 (0.64) | 4.55 (0.61) | 5.26 (0.81) | 4.47 (1.11) | 5.06 (1.32) |
| Cluster 2 (N = 43) | 5.58 (0.86) | 4.56 (0.93) | 5.54 (0.47) | 5.16 (1.00) | 4.45 (1.27) | 5.34 (1.47) |
| Cluster 3 (N = 54) | 5.31 (0.41) | 3.60 (0.79) | 3.53 (0.97) | 4.46 (1.06) | 4.07 (1.19) | 4.58 (1.56) |
| Cluster 4 (N = 31) | 3.83 (0.76) | 3.40 (0.88) | 3.82 (1.04) | 3.62 (1.17) | 4.29 (1.00) | 4.63 (1.64) |
| *Mean sample score* | *5.21 (0.92)* | *4.33 (1.12)* | *4.36 (1.09)* | *4.73 (1.15)* | *4.32* | *4.91 (1.51)* |
| *F-test* | *54.92* | *33.96* | *57.48* | *22.06* | *1.37* | *2.50* |
| *p-value* | *0.00* | *0.00* | *0.00* | *0.00* | *0.25* | *0.06* |
| *p-value C1,2 vs C3,4* | *0.00* | *0.00* | *0.00* | *0.00* | *0.07* | *0.00* |

Cells include mean construct scores and standard deviations (between brackets).

* Missing values on the innovation and financial performance items cause the sample size of these analyses to reduce to 184 and 173, respectively.

**Table 6 Evidence on the trade-off between selection and incentive contracting (N=100)**

| | *Incentive contracting* |
|---|---|
| *Constant* | 5.66 |
| | 6.76*** |
| *OL* | -0.03 |
| | -0.33 |
| *Delegation* | 0.66 |
| | 2.85*** |
| *Competition* | -0.19 |
| | -2.90*** |
| *Market turbulence* | -0.04 |
| | -0.46 |
| *Size* | 0.31 |
| | 2.46** |
| *Selection* | -0.18 |
| | -2.26** |
| *F* | 4.07*** |
| $R^2$ | 0.21 |
| $R^2$ *adj* | 0.16 |

Note: This regression analyses includes the cases of cluster 1 and 2, in which emphasis on OL is high and differences in performance are not significant. Cells include the coefficient estimate and *t*-value (***, **, * indicate a *p* value < 0.01, 0.05 and .10; two-tailed). Re-estimating the model for clusters 3 and 4 results in a positive and insignificant coefficient for selection.

**Table 7: Cluster differences between reliance on types of performance measures for managerial evaluation (N=180)**

| | Aggregated financial | Disaggregated financial | Non-financial |
|---|---|---|---|
| Cluster 1 (N = 57) | 0.54 | 0.27 | 0.16 |
| | (0.25) | (0.23) | (0.13) |
| Cluster 2 (N = 42) | 0.60 | 0.18 | 0.15 |
| | (0.20) | (0.18) | (0.14) |
| Cluster 3 (N = 51) | 0.43 | 0.35 | 0.19 |
| | (0.26) | (0.26) | (0.20) |
| Cluster 4 (N = 30) | 0.53 | 0.25 | 0.15 |
| | (0.29) | (0.20) | (0.20) |
| *Mean sample scores* | *0.52* | *0.27* | *0.16* |
| | *(0.26)* | *(0.23)* | *(0.17)* |
| *F-test* | *3.88* | *4.26* | *0.44* |
| *p-value* | *0.01* | *0.01* | *0.73* |
| *p-value C1,2 vs C3,4* | *0.01* | *0.03* | *0.45* |

Cell entries represent the percentage reliance on the type of performance measure for managerial evaluation. Aggregated financial measures include stock, return and profit measures. Responses to the category 'other measures' are low and omitted. Five responses with missing values are omitted.

## Appendix 1 Measurement Instruments

### Model constructs and control variables

*(all multi-item measures used 7-point Likert-type scales ranging from 1 (strongly disagree) to 7 (strongly agree), unless stated otherwise.*

Organizational Learning

Respondents were asked to indicate the extent to which they agreed with the following statements.

- Our ability to learn is a key to our competitive advantage
- The basic values of our business unit include learning as a key to improvement
- In this business unit, employee learning is widely considered an investment not an expense.
- Learning in my business unit is seen as essential to guarantee organizational survival.

Selection

Respondents were asked to the extent to which they agreed with the following statements regarding the practices used for selection of lower-level managers.

- Our business unit has gone to great lengths to establish the best staffing procedure possible.
- Individuals must undergo a series of evaluations before they are hired.
- Our business unit takes pride in the fact that we hire the very best people for the job.

Incentive contracting

First, respondents were asked to the extent to which they agreed with the following statements regarding the practices used for performance evaluation of lower-level managers by the senior management team.

- Managers of this business unit are evaluated based on results.
- The performance targets of the managers in this business unit are written in stone.
- Pre-established targets are used as a benchmark to evaluate the managers' performance.
- Regardless of what the manager of this business unit are like personally, their performance is judged by results achieved.

Then, in a later part of the questionnaire, respondents were asked to indicate the percentage of total compensation that corresponded to the statement below. Responses were measured on an 8 point scale ranging from 1 (0%) to 8 (over 60%) with a constant increase of 10% between each scale item.

Please indicate the percentage of total compensation that is performance-related for those managers who report directly to senior management (e.g., if managers receive a fixed salary

regardless of performance, circle (1), if 20% of compensation is paid as a bonus dependent on performance circle (3), etc.)

Types of Performance measures.

We measure the weights placed on different types of performance measures by asking respondents to indicate the percentage weight (0% - 100%, with a total maximum of 100%) placed on the following measures:

- Stock-price related measures (e.g. share price)
- Non-financial measures (e.g. market share, customer satisfaction, quality)
- Profit measures (e.g. profit margin, income, gross margin to sales)
- Revenue and cost measures
- Return measures, please check below the appropriate measure:
    - Return on Investment (ROI), Return on Net Assets (RONA), Return on Capital Employed (ROCE)
    - Residual Income (RI)
    - Economic Value Added (EVA)
    - Cash flow Return on Investment (CFROI)
    - Shareholder Value Added (SVA)
    - Other return measures (please specify its calculation)
- Other measures not mentioned (please specify)

Delegation

Respondents were asked to tick ONE of the three options below that best describes the approach to managing the business unit. Options 2 and 3 reflect greater delegation and in the analyses are combined and contrasted with option 1.

- Rather than focusing on the attainment of desired targets, senior management monitors the decisions and actions of lower level managers on an on-going basis.

OR

- Senior management focuses on the attainment of set targets for lower level managers and allows them considerable discretion in deciding the best way of achieving those targets.

OR

- Rather than specifying desired targets or monitoring lower managers' decisions and actions, senior management relies on the professionalism of lower managers to do the right thing by the business unit.

Competition

Respondents were asked to respond to the following statements.

- Competition in this industry is cut throat.

- There are many promotion wars in our industry.
- Price competition is a hallmark of our industry.
- One hears of a new competitive move very frequently.

Market turbulence

- In our kind of business customers' preferences change quite a bit over time.
- Our customers tend to look for new products all the time.
- We are witnessing demand for our products and services from customers who never bought them before.
- New customers tend to have product-related needs that are different from our existing customers.
- We cater to much the same customers that we did in the past. [ommitted]

Size

Respondents were asked to provide an answer to the following question:

- What is the approximate number of full time employees in your business unit? (_) people.

Organizational Outcomes - Shared Vision

Respondents were asked to indicate the extent to which they agree with the following items.

- There is a "commonality of purpose" in our business unit.
- There is total agreement on our business unit's vision across all levels and departments within our business unit.
- Our business unit has a high level of shared understanding about key business issues.

Organizational Outcomes - Innovation

Respondents were asked to rate the extent to which the BU in the past three years as compared to the firm's major competitor (1 = much more than your major competitor, 4 = about the same as your major competitor , 7 = much less than your major competitor).

- placed significant emphasis on new product development through allocation of substantial financial resources
- developed a large variety of new products or made drastic changes in existing products
- increased the rate of new product introductions to the market
- and increased its overall commitment to develop and market new products

Organizational Outcomes - Financial Performance

We measured financial performance in two ways. First, we measured it relative to competitors over the past year. Respondents were asked to indicate the extent to which they agreed with the following statement. Responses were measured on a 7 point scale ranging from 1 (More than 20% better), 2 (11% to 20% better), 3, (1% to 10 better), 4 (About the same), 5 (1% to 10% worse), 6 (11 to 20% worse) to 7 (More than 20% worse).

- How would you rate your overall financial performance relative to your competitor over the past year?

Second, we measured it in terms of the change in financial performance over the past year. Respondents were asked to indicate the extent to which they agreed with the following statements. Responses were measured on a 7 point scale ranging from 1 (Decrease by more than 10%), 2 (Decrease of 5 to 10%), 3, (Decrease of up to 5%), 4 (Relative constant), 5 (Increase of up to 5%), 6 (Increase of 5% to 10%) to 7 (Increase by more than 10%).

- Over the past year what was the percentage change in your profit?
- Over the past year what was the percentage change in your return on investment?

**Measurement items used for validity testing of model constructs**

Organizational Learning

Three measures were used to assess the validity of the Organizational Learning construct:

(a) An objective measure of the amount of time spent in the prior year on learning. We asked respondents to provide a percentage estimate to the following question:
   - Please indicate the amount spent on employee development last year (e.g. training courses, house seminars, etc.) as a percentage of sales.

(b) A four-item perceptual measure of the extent to which the business unit engages in (continued) employee development. To measure the extent to which the business unit engages in this development respondents were asked to respond to the following four items on a seven point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree).

   - Managers receive substantial training before they assume responsibility.
   - After being on the job for years, managers continue to be involved in skill development.
   - Managers are given ample opportunity to broaden their range of talents.
   - Our business unit has a strong commitment to training and developing managers' skills.

(c) We asked respondents to reflect on the importance for the business unit to build a reputation of being first in the industry. Respondents were asked to respond to the following item on a seven point Likert scale ranging from 1 (extremely important) to 7 (of little importance).
   - How important is building a reputation for being first in the industry to try new methods and technologies?

Employee selection

For selection, the validity test was based on education level of the senior management team (SMT). The following information was collected about each member of the SMT: job title,

gender, age, education, tenure, industry experience. Each senior management team member was added on a separate row. Education, of which the average score of the SMT is used for the validity test, was measured as follows:

- Education (1 = High School - not completed, 2 = High school graduate, 3 = TAFE graduate or some TAFE education, 4 = Some college or university education, 5 = College or university degree, 6 = Post-graduate)

Incentive contracting

For incentive contracting, we conducted a validity test based on a measure of employee turnover. Respondents were asked to respond to the following question by providing a percentage:

- What percentage of your workforce voluntarily left the business last year? (do not include voluntary redundancies).

Shared Vision

For shared vision, the validity test were based on two measures. First, we capture an outcome of shared vision by one item on a seven point Likert scale ranging from 1 (strongly disagree) to 7 (strongly agree). Respondents were asked to indicate whether "our shared understanding of business unit issues supports the development of new ideas".

Second, we capture the level of friction within the senior management team (SMT) that should negatively affect shared vision across the organization. Respondents were asked to respond to the following eight items (from 1 (strongly disagree) to 7 (strongly agree)).

(a) There is a great deal of friction between senior management team members.
(b) There are personal conflicts evident in the senior management team.
(c) There is tensions among members of the senior management team.
(d) There is emotional conflict among the members of the senior management team.
(e) People in the senior management team often disagree about opinion regarding the work being done.
(f) There are frequent conflicts about ideas in the senior management team.
(g) There is much conflict about the work that is done by the senior management team.
(h) There are significant differences in opinion in the senior management team.

Innovation

For innovation, the validity test were based on four measures.

1. What is your market share in the industry? (_) percent
2. Over the past year, how much did your market share change? 1 (Decrease by more than 10%), 2 (Decrease of 5 to 10%), 3, (Decrease of up to 5%), 4 (Relative constant), 5 (Increase of up to 5%), 6 (Increase of 5% to 10%) to 7 (Increase by more than 10%).
3. How would you rate your customer churn relative to your customers? 1 (More than 20% better), 2 (11% to 20% better), 3, (1% to 10 better), 4 (About the same), 5 (1% to 10% worse), 6 (11 to 20% worse) to 7 (More than 20% worse).
4. In our business unit, new insights and ideas get developed into improved products or services. 1 (strongly disagree) to 7 (strongly agree).

For the validity analyses reported in the paper, items 2 and 3 were reversed in coding to make larger scores reflect better performance.