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Internal Performance-Based Steering in Public Sector Organizations: Examining the Effect of Organizational Autonomy and External Result Control — [Source link](#)

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Internal performance-based steering in public sector organizations: examining the effect of organizational autonomy and external result control

Abstract: The use of performance management techniques by public sector organizations is believed to lead to a higher efficiency and a better performing public sector in general. Using multi-country survey data, this article provides an understanding of the effect of organizational autonomy and external result control on the use of internal performance-based steering towards lower hierarchical levels in public sector organizations. Results show that result control matters, just as financial management autonomy. Yet no effects can be observed for personnel management autonomy.

Keywords: NPM, internal performance-based steering, autonomous agencies

1 New Public Management and performance management techniques

New Public Management (NPM) has known many different interpretations, but one central claim is that centralized, hierarchical organized systems are unable to adapt to the fast-changing environment and to deliver services efficiently and effectively, giving rise to a lack of result- and customer-orientedness of public organizations (Osborne and Gaebler, 1992; Hood 1991; Keating 1989). According to NPM these problems can be solved by decentralizing the public sector on an operational level, while centralizing it on a strategic level. Basically NPM advocates giving managers autonomy in managerial and operational decisions (how to deliver services) whereas through the introduction of result control instruments, the same managers would be tightly controlled about what they deliver in terms of services. Decision making authority about operational and managerial decisions would be then decentralized towards managers, whereas strategic decision making about the objectives and results to obtain and outputs to deliver would be centralized and decided by ministers/higher levels.

In short, public sector organizations should have more organizational autonomy and should be controlled by the government on the basis of results (external result control). This is believed to make organizations more likely to implement various innovative management techniques or tools (often copied from the private sector) which in turn, at least by NPM advocates and believers) is assumed to lead to a better performance. Since performance management is believed to play a pivotal role in increasing public sector performance (e.g. Ingraham et al., 2003), and performance is a concept which is central in the public sector (e.g. Hood, 1991; Osborne and Gaebler, 1992; Ferlie, 1996), it is relevant to explore the factors that determine the use of performance management techniques by public sector organizations. Using multi-country survey data this article examines the role of organizational autonomy and external result control by the political principals of public sector organizations on the use of

performance management techniques within these organizations independent of country characteristics. Regarding these performance management techniques, we focus on the extent that senior management of the public sector organizations use performance based steering to control lower hierarchical levels and organizational subunits in these organizations. In doing so, this paper contributes to the sixth theme identified for the special issue, i.e. ‘How do performance management systems aim to cope with problems of coordination, management and evaluation in new forms of public service provision’. Agencification of public sector organizations by granting them autonomy and controlling them by results is considered to be a type of organizational innovation and leading to a new form of public service provision (see e.g. Valkama, Bailey & Anttiroiko, 2013).

Granting a public sector organization more organizational autonomy involves shifting decision making competencies from external actors (i.e. ministers, parent departments) to the organization itself by delegation or devolution. For what follows organizational autonomy is defined as the extent to which an organization can decide independently from political and administrative principals on the choice and use of resources (Verhoest, Peters, Bouckaert, & Verschuere, 2004) and thus refers to the managerial decisions senior managers can make. External result control refers to the extent to which public sector organizations are given clear objectives by ministers and parent departments and the extent to which achievement of these objectives is monitored, evaluated and sanctioned or rewarded in case of mal-or good-performance (Schick, 1996; Bevan & Hood, 2004; Verhoest, Roness, Verschuere, Rubecksen, & MacCarthaig, 2010). Just like organizational autonomy, external result control is thus a process involving the principal (oversight government). The relation of organizational autonomy, external result control of public sector organizations and the internal use of performance management techniques within these organizations is visualized in figure 1.

Please include figure 1 here

Performance management can be defined as acting upon performance information and using such information for decision making in a systematic form (Bouckaert & Van Dooren, 2003). A prerequisite for performance management is that organizations have performance information (Cronbach, Ambron, Dornbusch, Hess, Hornik, Phillips, Walker, & Weiner, 1980; Van Dooren, 2005). This information or knowledge can then be converted into action (Stehr, 1992), and thus be used for specific performance management techniques. This article examines the use of one specific performance management technique, namely the internal steering of organizational subunits and lower management levels on the basis of results. This technique refers to the extent to which the senior management of a public sector organization sets performance objectives for lower management levels and organizational subunits, and monitors and sanctions the achievement of these objectives on a regular basis. In line with literature (e.g. Verhoest et al., 2010; Van Dooren, Bouckaert, & Halligan, 2010) we consider this management technique to be a good and representative example for performance management techniques in general.

Reflecting the increasing use and sophistication of performance management in the public sector, a lot of literature concerning the effect of performance measurement and performance information use has emerged (see e.g. Moynihan & Pandey, 2010; Heinrich, 1999; De Lancer Julnes & Holzer, 2001; Askim, Åge & Knut-Andreas, 2008). Although some of these papers find evidence of a positive effect (e.g. Moynihan, 2008; Van Dooren et al., 2010; Walker, Boyne, & Brewer, 2010), the general tendency is that the relation between using performance information and performance improvement is not a given.

Moreover, the actual use of performance management techniques has traditionally not been very high on the research agenda (Van de Walle & Van Dooren, 2008). This is

confirmed by Moynihan and Pandey (2010) who state that using performance management techniques remains one of the most important yet understudied issues in performance management. Furthermore, literature indicates that there is only partial, reluctant implementation or even a general lack of using such techniques by public managers (e.g. Van Dooren et al., 2010; Walker et al., 2010). This in turn stresses the relevance of identifying the factors that affect the use of performance management techniques, like for instance the internal steering of organizational subunits and lower management levels on the basis of results by public sector organizations. The fact that previous work heron has not yet resulted in a common or overarching theory for explaining the use of such management techniques (Moynihan & Pandey, 2010) only supports this claim. As Moynihan and Pandey (2010) point out variables used in literature range from rational/ technocratic and political/cultural factors (e.g. De Lancer Julnes & Holzer, 2001) to performance measurement characteristics (e.g. Melkers & Willoughby, 2005), making it impossible until now to confirm or reject whether or not organizational autonomy or external result control induce public sector organizations to use performance management techniques.

In the following section, a theoretical framework will be presented and hypotheses will be formulated. Secondly, we will present the econometric analysis and our findings. Finally, we will draw some conclusions.

2 Organizational autonomy with or without external result control?

As noted by Aucoin (1990) and others, NPM is all but a theoretically coherent doctrine. There are at least two different intellectual streams that feed into NPM and which are particularly relevant to explain the use of performance management techniques on an agency level: managerialism and principal-agent theory, with the latter being more popularly known than the former (Pollitt, 2004; Christensen & Lægreid, 2001; Norman, 2003). Since we

consider internal performance-based steering to be a good example of performance management in general, these theories, explaining the use of performance management techniques in general, should consequently also apply for internal performance-based steering.

The managerialist school of thought focuses on the need to reestablish the primacy of managerial principles over bureaucracy (Pollitt, 2004; Norman, 2001). According to this theory, public bureaucrats should be given as much leeway as managers in the private sector to manage their own organization. In essence, this theory states that the capacities of modern complex agencies can be enhanced by management flexibilities which debureaucratize organizational systems. Accordingly, an overemphasis on (specific kinds of) control on these public managers seriously reduces the capacity for action (Hoggett, 1996). When freed from bureaucratic regulations, public managers will tend to look for the best ways to steer their organization, leading them to adopt performance management techniques which have proven their usefulness in the private sector. Hence, the core assumption is that increasing organizational autonomy of public sector organizations will foster the use of performance management techniques in these organizations: 'letting public managers manage' (Pollitt, 2004). As senior managers of agencies feel more responsible for and yield more personal benefits from the performance of their own organization (in whatever way), they will resort more quickly to instruments which allow them to control their own organization. Moreover, as Moynihan and Pandey (2010, p.7) suggest: 'If managers have the freedom to experiment with processes, they have an incentive to examine performance data to find rationales for innovation. If managers are restricted in their ability to pursue process change, insights derived from examining performance data are less likely to be useful, and therefore, the incentives to use data are reduced'. Besides the managerialist school of thought, there are other theories which advocate autonomy for public sector organizations, like open system

theory, property rights theory and stewardship theory. Empirically, there is some evidence that increased managerial decision making capacities stimulate organizational performance in the public sector, but studies are far from univocal in their findings (see for reviews related to the agency autonomy Verhoest et al., 2004; Lægreid & Verhoest, 2010; see for reviews related to decision making decentralization; Boyne & Walker, 2005; Moynihan & Pandey, 2005; Andrews, Boyne, Law, & Walker, 2007). Organizational autonomy appears indeed to be positively associated with organizational learning (Moynihan & Landuyt, 2009; Schulz, 2001) and the use of performance management techniques (Moynihan & Pandey, 2010), but its counterpart ‘centralization’ also appears to have positive effects. A study of 226 Belgian, Irish and Norwegian semi-autonomous agencies indicated that financial management autonomy had an independent positive effect on the use of performance management techniques, but there was no such effect of personnel management autonomy (Verhoest et al., 2010). Based upon literature we construct the following hypothesis:

H1: Organizations with higher levels of organizational autonomy are more likely to use internal performance-based steering compared to organizations with lower levels of organizational autonomy.

Whereas the managerialist school is very optimistic about the behaviour of public managers under conditions of extended managerial autonomy, the principal agent theory asserts that because of goal incongruence (or conflict) and information asymmetry between the agency and its political principals, there is a considerable risk of opportunistic behavior by the agency (Pratt & Zeckhauser, 1991). Opportunism can take the form of adverse selection, moral hazard, and, in policy settings, to a subversive or deviant policy implementation by the agent (Waterman & Meier, 1998). Following this line of reasoning, public managers of

autonomous public sector organizations will have no incentives to use performance management techniques within their own organizations. On the contrary, performance management techniques may enhance the information for the political principal about potential shirking or deviant behaviour of the agency.

Three kinds of mechanisms can be used to avoid these problems in the principal-agent relationship: bonding or having ex ante guarantees of compliance by the agent, result monitoring of agents by principals, and result-based incentives and risk sharing (Jensen and Meckling, 1976). According to Bouckaert (1998), result control by the political and administrative principals is believed to temper opportunistic behavior by the public agency and to enhance its performance in several ways. First, the information asymmetry between the government and the public agency as to the performance of the latter is lessened by the use of information revealing instruments. Second, the goals of both parties are aligned more closely because clear objectives and targets are set and negotiated. Third, result control instruments like performance contracts may set priorities among the objectives of the different involved ministers, reducing the "multiple principals' problem" (Bouckaert, 1998).

Under a regime of strict result control by their political principals, public managers will be induced to translate the performance targets, set for the organization, into internal targets for lower managerial levels and front line staff, since these public managers are held accountable for achieving the organizational performance targets. Using performance management techniques within their own organization enables public managers to monitor and steer lower management and organizational units in such a way, that achievement of the organisational performance targets is guaranteed and that the needed performance information to report to the political principal is made available. Moreover, public managers may also apply performance management in their organization as a form of bonding towards their political principal, as a way to convince the principal that the public managers are keen and

well-equipped to achieve the set objectives. Although scarcely studied, the independent influence of external result control of agencies is considered to have a positive influence on the use of performance management tools within agencies (see Verhoest et al, 2010). Consequently we formulate the following hypothesis:

***H2:** Organizations with higher levels of external result control are more likely to use internal performance-based steering compared to organizations with lower levels of external result control.*

Hence, according to principal agent theory, more organizational autonomy may enhance performance by public sector organizations only under the condition of external result control. This argument is central to NPM, which emphasizes not only ‘letting public managers manage’ but simultaneously ‘making public managers manage’. This refers to the so-called paradox of autonomization in which autonomization of public agencies may imply stricter central regulation (Kickert, 1998, Smullen, Van Thiel & Pollitt, 2001). This paradox of autonomization is essentially about a reduction of extensive input regulation and process regulation, combined with a stricter regulation on performance (Bouckaert & Verhoest, 1999; Hoggett, 1996). High levels of organizational autonomy have to be counterbalanced by a high level of regulation through accountability on results and use of rewards and sanctions. Organizations which have lower levels of autonomy and which are closer to government would need less result regulation, for the potentiality of information asymmetry and opportunistic behaviour is much less in these cases. As such it is clear that a precarious balance between autonomy and control has to be established. In this paper we will therefore not only test the influence of organizational autonomy and external result control separately but we will also take their interactions into account. For this interaction and based upon NPM doctrines, which state that both organizational autonomy and external result control are

necessary conditions for the adoption of private sector like management techniques, we formulate the following hypothesis:

H3: *Organizations which combine higher levels of organizational autonomy and external result control are more likely to use internal performance-based steering compared to organizations with lower levels of organizational autonomy and external result control.*

Furthermore we control for some other factors, which have shown in previous empirical research to influence the use of performance management techniques in the public sector (see for example Van Dooren, 2005; Læg Reid, Roness & Rubecksen, 2006; Moynihan and Pandey, 2010). By controlling for these factors, we want to reduce the possibility that the found influences of organizational autonomy and/or external result control on the use of performance management techniques are in fact due to the influence of other variables which are not in the model. More specifically, we control for the following factors:

1) Measurability of primary organizational task, distinguishing between tasks which are difficult to measure (i.e. policy formulation, regulation and other tasks of public authority) and tasks which are relatively easy to measure (i.e. service delivery and commercial tasks) (see for the positive effect of increased measurability, Van Dooren, 2005; Radin, 2006; Moynihan & Pandey, 2010; Verhoest et al., 2010; for no effect Læg Reid et al., 2006; regarding the influence of availability of performance information as well as the quality on performance information use, see De Lancer Julnes & Holzer, 2001; Moynihan & Ingraham, 2004; Ammons & Rivenbark, 2008).

2) Type of agency or affiliation, distinguishing between agencies without their own legal identity and those with an own legal identity (Bouckaert & Van Dooren, 2003; Verhoest et al., 2010; Bogumil & Ebinger, 2008; Bach & Jann, 2010).

3) Organizational size in terms of staff, as proxy for the need for performance management tools as internal control mechanisms as well as the capacity to implement such tools (Moynihan & Ingraham, 2004; Læg Reid et al., 2006; Poister & Streib, 1999; Askim, 2009);

4) Budget size as proxy for degree of political salience of an organization (Pollitt et al., 2004; Verhoest et al., 2010); or adequacy of allocated resources (De Lancer Julnes & Holzer, 2001; Grizzle & Pettijohn, 2002; Askim et al., 2008; Moynihan & Landuyt, 2009; Van Dooren, 2005).

5) Dominant source of income, which distinguishes between agencies predominantly financed by self-generated income versus agencies predominantly dependent from governmental funding, which serves as as proxy for the level of market pressure versus pressure from the funding government (Pollitt, Talbot, Caulfield, & Smullen, 2004; Moynihan & Ingraham, 2004; Bogumil & Ebinger, 2008).

6) Organizational age (years between data collection and creation of public sector organization with the present legal status) as a proxy for organizational culture, which are less or more susceptible for performance management (Franklin, 2000; De Lancer Julnes and Holzer, 2001; Moynihan, 2005; Pandey, Coursey & Moynihan, 2007; Moynihan & Landuyt, 2009; Moynihan & Pandey, 2005), or as an indicator for organizational stability (positive effect Askim, 2009; negative effect Læg Reid et al., 2006; or no independent effect Verhoest et al., 2010).

Furthermore, we also control for the influence of the country in which public sector organizations are located. As indicated by previous research the politico-administrative

regime of a country (e.g. the societal culture and political system), the reform trajectory of a country and other institutional factors of countries form contexts and path dependencies which might enhance or reduce the use of performance management in public sector organizations (Pollitt & Bouckaert, 2011; Verhoest et al., 2010).

3 Empirical Implementation

Data used for the analysis have been provided by the “Comparative Public Organization Data Base for Research and Analysis” or COBRA-network. The COBRA network aims to encourage and enable comparative research into public sector organizations (for more information see; <http://soc.kuleuven.be/io/cost/index.htm>). It developed a common questionnaire in order to survey senior managers of public sector organizations. The questionnaire focuses on issues of autonomy, control and management of public sector organizations, in particular, (semi)-autonomous agencies. The CEO of each agency was asked to answer on behalf of the entire organization (including subunits). The motivation behind using the perception of CEOs about the actual autonomy and control of their agency is that this will heavily influence their actions and the way in which they manage their agency. In a previous and comprehensive case study by Verhoest (2002), it becomes clear that the de facto autonomy and control perceived by the CEOs may differ substantially from the formal autonomy and control of agencies (as set out in legislation and regulations). Later studies have yielded similar observations (Verhoest et al., 2004, Yesilkagit, 2004), or shown that the behaviour of CEOs was guided by these perceptions (Verhoest, 2005a, 2005b). Perceptions of autonomy and control give us thereby insights about the room for manoeuvre that CEOs think they have, and hence about the actual functioning of agencies (Verhoest et al., 2010).

The joint data set comprises unique agency-level survey data spread across 15 different countries. For this paper we will use survey data on agencies from 9 countries from different

survey years: Belgium (2004), Italy (2006), The Netherlands (2006), Hong Kong (2007), Austria (2009), Germany (2008), Portugal (2010), Romania (2010) and Sweden (2009). The selection of these countries is not vested in theory but is based on maximizing the amount of data while maintaining a representative sample, see descriptive statistics. The used dataset is constructed using surveys from not only different countries but also from different years, which in turn complicates analyses and reduces possibilities. Yet, the goal of this article is not to conduct a cross state comparison of the effect of organizational autonomy and external result control on using internal performance-based steering, but to examine this relation independently from country characteristics. The sample used in this article exists of specific types of public sector organizations, which we refer to as agencies. Following Pollitt et al. (2004) we include those public sector agencies with following features: 1) they are public law bodies, 2) they are structurally disaggregated from other organizations or from units within core ministries, 3) they have some capacity for autonomous decision making with regard to management policy, 4) they are formally under at least some control of ministers and ministries, 5) they have some expectation of continuity over time, and 6) they have some resources on their own. Companies and corporations with a commercial focus which have to closely observe the laws regulating private companies or which are registered under company law as a company and governmental foundations, trusts and charities are excluded from our understanding of agencies. The organizations in our sample thus range from departmental agencies without their own legal identity, to public law agencies and private law agencies, which do have their own legal identity. These agencies differ to the extent they have been granted organizational autonomy.

3.1 Measuring the use of internal performance-based steering

The ordered variable "internal steering" represents the main dependent variable in our different models to be estimated. We investigate the use of internal steering based on direct

survey evidence. In particular, the CEOs of agencies were asked the following question: To what extent is there in your organization internal performance-based steering of the organizational subunits and lower management levels on objectives and results? They were given the following three options: no, to a small extent or to a large extent. The dependent variable is set to zero if the agency indicated that it does not happen, to one if it only happens to a small extent and is set to two if it happens to a large extent.

The use of internal performance-based steering can be initiated by actors outside the organization as a way to carry out central regulation or control of activities within agencies towards a desirable standard or goal (Lægreid et al., 2006). Moreover, a neo-institutional explanation is also possible. The use of management techniques can also because of technical reasons, to promote better performance, but only for those organizations where the management practice is more likely to promote improved performance (Lægreid et al., 2006). However, the use of internal performance-based steering can also be an intentional choice by the organization itself. Following normative isomorphism, agencies may pick and choose based on enhancing their legitimacy in their environment (Lægreid et al., 2006). In this article we stick to the last interpretation and regard the use of internal performance-based steering as a willful choice from agencies.

For our model specifications we derive a set of explanatory variables that are potential indicators of the degree to which an agency will make use of internal performance-based steering. Our explanatory variables can be divided in two categories. First, autonomy & result control-related factors and second control variables.

3.2 Autonomy & result control related characteristics

Two types of organizational autonomy are taken into account; personnel management autonomy (PA) and financial management autonomy (FA). Personnel management autonomy relates to the autonomy to take decisions concerning salary level, promotion, and evaluation

of staff, in general (so beyond individual decisions) without interference from ministries. If agencies have no autonomy for any of the indicators the variable is set to zero (no personnel management autonomy). If agencies indicate to have autonomy for all indicators, the variable is set to two (high personnel management autonomy). If the agency has autonomy for some of the indicators the value of the variable is equal to one (some personnel management autonomy).

Financial managerial autonomy is measured in a similar way. An index is constructed, based on the aggregation of the scores on three items: the extent to which the organization is able to shift personnel and running cost budgets, to set tariffs for services and products, and to shift personnel- running cost and investment budgets. However, unlike the indicators for personnel management autonomy, organizations can either have no autonomy (score 0), needing prior approval from parent ministries (score 1) or without prior approval from above (score 2). Each variable is recoded to a dummy (dummies are set to zero if score equals 0 or 1 and set to one otherwise) and then aggregated¹. After which this sum is transformed to a variable with 3 categories in a similar way as for personnel management autonomy.

Second, we add information about external result control. The variable result control is based on whether or not the CEO is accountable for results, and whether or not rewards or sanctions follow mal-performance. When the CEO is not accountable for results or only to a small extent, result control is set to 0. If the CEO is to a large extent accountable for results, the variable result control is set to 1. Result control is set to 2 if the CEO is accountable for results *and* sanctions or rewards are linked to these results (see Verhoest et al., 2010).

Since we expect that the effect of autonomy is linked with the level of result control, we include interactions of these covariates (see H3).

3.3 Control variables

As previously discussed, we include a set of control variables in order to account for the effects of variables other than autonomy related factors. One such variable is the measurability of the primary organizational task. A dummy (Measurability of task) is included in order to examine the effects of primary organizational task. This dummy is set to one when the primary task exists of delivering services (general public services and business and industrial services). Moreover, type of agency (Type) is included in the analyses. Type is coded one if the agency is a public or private law based corporation and is set to zero otherwise. But also information is added on the size of the agency. Size in terms of budget (Budget) and number of staff, measured in FTE (Size), are included. These are added as variables with 3 categories, where the lowest category is used as a benchmark. Furthermore a dummy (Dominant source of income) concerning income source is added. This variable reflects the main source of income of the organization, is the organization self- financing or financially dependent from the government instead. Some organizations depend on governmental subsidies for all of their financial resources, while other organizations also receive financial resources from elsewhere (e.g. via selling products), and are thus not financially dependent on the government. This dummy equals 1 if the income source is mainly nongovernmental, and zero otherwise. As a final control variable age is included. Agencies 'age (Age) is measured in years since founding (survey year minus year of set- up) and is included as a variable with 3 categories, where the lowest category is used as a benchmark.

3.4 Descriptive statistics

This subsection is devoted to a descriptive analysis aimed at investigating: (1) the representativeness of the subsample used in the regression analysis; and (2) possible occurrence of collinearity problems. Table 1 shows summary statistics for the main variables.

The purpose of this table is to check whether the estimation subsample used in the regressions continues to be representative of the entire sample or is instead biased in one or more variables, because of an unbalanced distribution of missing values. We do not employ the complete original sample but only a fraction hereof since information had to be available on all (used) variables. We therefore compare the used sample with the (representative) original sample².

Please include Table 1 here

Overall, the values reported in Table 1 in the Original Sample and Used Sample columns are very similar. This suggests that missing values were randomly distributed, and that the observations used to estimate the regressions constitute a representative subsample of all the agencies that were originally included in the survey.

The linear correlation analysis among the regressors is reported in Table 2, showing that the highest correlation exists between personnel and financial management autonomy (0.552). Organizations which enjoy one kind of autonomy appear to be likely to also enjoy other forms of autonomy.

Please include Table 2 here

We also test for multicollinearity using the variance inflation factor (VIF). The mean VIF equals 1.23 (maximum VIF equals 2.11), indicating that no collinearity exists between the variables or in other words; that the shared variance of the variables is rather low and their discriminant validity is potentially high.

3.5 Econometric analysis

Since the dependent variable "internal steering" is measured on an ordinal scale, we model an ordered logit model and calculate odds ratio's. When examining results, this means that for a unit increase in x_k , the odds of a lower outcome compared with a higher outcome are changed by the factor $\exp(-\beta_k)$, holding all other variables constant. For instance, an odds ratio of 2 for variable agencies with services as primary task means that the odds of using internal performance-based steering are 2 times higher for agencies having services as primary task compared to agencies with other primary tasks. See Long & Freese (2005) for a more thorough discussion. Since agencies are nested in different countries, we include country dummies in order to take country clustering into account. This way we are able to investigate relations while controlling for the influence of country characteristics. The possibility that the found influences of managerial autonomy and/or result control on the use of performance information are in fact due to the influence of country characteristics is consequently reduced. Furthermore given the different survey years, a time dummy should be included. Since these time dummies however often correspond to the country dummies, time dummies could not be added. As such, the country dummies not only capture the unobserved heterogeneity between countries but also between survey years. Consequently the country dummies do not only cover the country differences but also time differences. Interpreting these dummies is impossible. Not only is it difficult to explain what a significant country dummy represents (these can capture a wide range of country level variables) but the time aspect makes it unmanageable since one does not know what one is measuring. In case of the COBRA data, we can only correct for the country and time differences using dummies. Admittedly, these are weak measures, it would be better to use clustered standard errors or multilevel analyses, yet these demand a higher amount of countries. Nevertheless, our goal in this paper is to examine the relation between organizational autonomy and external result

control independent of the impact of country/time differences, and for that purpose the mere inclusion of country dummies will suffice.

Moreover, the data are cross-sectional which makes a positive correlation between managerial autonomy, result control and the use of performance information not say much about the direction of causality; it could be that more autonomy and result control lead to an increased use of such information, or that agencies that make a greater use of performance information are more capable of ‘extorting’ a higher autonomy from oversight authorities over time. To solve this issue the concept of Granger causality³ can be used to test for causal relationships in both directions. This would however require longitudinal data which are not available, neither publicly nor in our dataset. In line with previous research (e.g. Moynihan & Pandey, 2010, Lægreid et al., 2006, Verhoest et al., 2010) we will therefore rely on theoretical arguments.

3.6 Results

Table 3 shows the results of the ordered logit model. In column *A* the results for the model without the inclusion of the interactions between organizational autonomy and external result control is presented while these are included in column *B* and *C*. The model with the interaction between personnel management autonomy and external result control is presented in column *B* whereas the interaction between external result control and financial management autonomy is presented in column *C*. The interactions between the different forms of organizational autonomy and external result control have been included in separate tables in order to avoid small sample bias.

Include Table 3

When analyzing column *A* we notice a strong significant effect for external result control ($\chi^2(2)=18.21^{**}$). Agencies that are subject to higher degrees of external result control are

more likely to use internal performance-based steering compared to agencies with no external result control. More precisely, when the CEO is accountable for results, agencies are 1.6 times more likely to use internal performance-based steering. This figure even increases to 1.95 if this accountability is linked to rewards and/or sanctions. Overall external result control can thus be considered as a strong incentive to use this specific management technique, supporting hypothesis 2. Remarkably, both kinds of organizational autonomy appear to have no effect on the degree of internal performance-based steering (personnel management autonomy: $\chi^2(2)=2.44$ and financial management autonomy: $\chi^2(2)=4.91$).

Yet before drawing any conclusions on the effect of organizational autonomy, we analyze column *B* and *C* which include the interactions terms between organizational autonomy and external result control. When examining column *B* we again notice strong positive effect of external result control ($\chi^2(2)=12.59^{**}$) and no effect for both personnel and financial management autonomy. Surprisingly, and contrary to NPM doctrines, no significant effect can be found for the interaction terms between external result control and personnel management autonomy. Personnel management autonomy therefore does not appear to affect the use of internal performance-based steering, even not in combination with external result control.

Yet an opposite effect can be observed for financial management autonomy when examining column *C*. Organizations which have some degree of financial management autonomy are more likely to use internal performance-based steering compared to organizations without any kind of financial management autonomy ($\chi^2(2)=12.59^{**}$; 2.919^{**}). Financial management autonomy thus affects the use of internal performance-based steering. Strangely, no significant improvement can be observed for those organizations with high financial management autonomy. However the interaction terms indicate that the effect of financial management autonomy appears to be strongly influenced by the degree of external

result control organizations are subject to ($\chi^2(4)=22.78^{**}$). Models without the inclusion of interactions can consequently fail in observing the precise effect of financial management autonomy on using internal performance-based steering.

When examining the interactions more closely, we notice that these are all significant and positive. This indicates that the effect of financial management autonomy increases when it is combined with external result control (alternatively, one could say that the effect of external result control on the use of internal performance-based steering increases when it is combined with financial management autonomy). In short, the higher the degree of external result control and financial management autonomy, the higher the likelihood of using internal performance-based steering. The highest likelihood being 6.171, resulting from the combination external high result control and high financial management autonomy. In other words, organizations which are subject to this kind of combination of external result control and management autonomy are roughly 6 times more likely to use internal performance-based steering compared to organizations with no external result control and no financial management autonomy. In short we thus find mixed support for hypothesis 1 and 3.

When examining the control variables in Table 3, we notice that agencies with a large budget are also more likely to make use of internal performance-based steering. Although agencies with medium to large budgets are approximately two times more likely to use this kind of management technique, no such increase can be observed between organizations with medium and large budgets (1.901^{**} vs. 1.985^{**}). Dominant source of income, primary task, size and age do not appear to have an effect on the use of internal performance-based steering. Finally, all models indicate that the country dummies are of great importance, the percentage explained by these dummies fluctuates around 50% (model A:56%, model B:53% and model C: 54%). Context thus clearly matters. Yet, as discussed, the interpretation of these dummies proves to be impossible especially since these can also capture time effects.

4 Discussion & Conclusion

The results indicate that the link between increased organizational autonomy and external result control on the one hand, and the use of internal performance-based steering on the other hand, is not as clear-cut as expected by the NPM-doctrines. Overall an increase in external result control proved to have a positive effect on the use of internal performance-based steering. Consequently our results strongly support the assumption that having more controls in place is likely to bring about a higher likelihood of using internal performance-based steering, which is in line with principal agent theory. However, the assumption of a positive effect of organizational autonomy on the use of internal performance-based steering is only partially confirmed. Only financial management autonomy proved to have this effect. Our findings for financial management autonomy seem to be in line with most literature, which associates managerial flexibility positively with organizational learning and performance information use (Moynihan & Landuyt, 2009; Schulz, 2001; Moynihan & Pandey, 2010; Verhoest et al., 2010). Senior managers of agencies which are highly autonomous in their financial management (e.g. shifting budgets over posts and years) may want to control their own organizations better, because they feel more responsible to render good performance and because they have internally devolved this managerial autonomy to their lower levels. We thus find evidence in support for the principal agent theory and mixed effects for the managerialist school of thought.

Notwithstanding the positive effects of financial management autonomy and external result control separately, the strongest driver for using internal performance-based steering appears to be a combination of financial management autonomy and external result control. This is in line with NPM doctrines which stress the need for a combination of organizational autonomy and external result control. Letting and making public managers manage will, at least for combinations of external result control and financial management autonomy, have a

positive effect on the use of internal performance based steering. However no such effect can be observed for personnel management autonomy, not even in combination with external result control.

These results have some policy-relevant implications. Rather than using either-or thinking, public sector management would be better served by a recognition of a precarious balance between external result control and autonomy. Result control itself will not always lead to the highest use of internal performance-based steering, nor will organizational autonomy. Instead a balancing of organizational autonomy and external result control is required. Accordingly, a combination of financial management autonomy with external result control proved to be the driving force behind the use of internal performance-based steering. Governmental action to increase internal performance-based steering should therefore focus on these factors. The main policy relevance of this study's findings is that policy-makers should be aware that granting autonomy to agencies, and making agencies increasingly accountable for their results (e.g., by contracts), may not automatically lead to an increased use of performance information. Consequently, policy makers should develop different strategies for different (individual) agencies when they want to stimulate the use of performance information.

Further research should however use multiple measures and approaches to the relation between organizational autonomy, result control and the use of internal performance based steering in order to tap into all of the aspects of it. Especially internal performance-based steering can be regarded as a multifaceted phenomenon. Qualitative research would strengthen quantitative research such as that presented in this study by clarifying causal mechanisms and suggesting new ways of measuring core concepts. Structured interviews with top level managers would help the field to understand how the relationship between organizational autonomy and result control can lead to a higher use of internal performance

based steering. Moreover, this quantitative study relies on a limited amount of observations. This can give rise to small sample bias, omitted variable bias and reversed causality. We have tried to reduce these biases, for example, given the relatively small sample size, by not including an overload of covariates. Only control variables have been included which have in previous studies proven to explain the use of performance information. By doing so, the possibility of having omitted variable bias should have been reduced. For future quantitative research it would however be interesting to have large n panel data, preferably across a wide range of countries. This way reversed causality can be examined while more explanatory variables can be included, thereby reducing the likelihood of having omitted variable bias and allowing to examine the precise effect of country specific variables.

5 References

- Andrews, R., Boyne, G., Law, J., & R.M. Walker. (2007). Centralization, Organizational Strategy, and Public Service Performance. *Journal of Public Administration Research and Theory*, 19 (1), 57–80.
- Askim, J. (2009). The Demand Side of Performance Measurement: Explaining Councillors' Utilization of Performance Information in Policymaking. *International Public Management Journal*, 12 (1), 24-47.
- Askim, J., Åge J., & Knut-Andreas, C. (2008). Factors behind organizational learning from benchmarking: Experiences from Norwegian municipal benchmarking networks. *Journal of Public Administration Research and Theory*, 18, 297–320.
- Aucoin, P. (1990). Administrative reform in public management: paradigms, principles, paradoxes and pendulums. *Governance*, 3, 115–37.
- Bach, T. & Jann, W. (2010). Animals in the administrative zoo: organizational change and agency autonomy in Germany. *International Review of Administrative Sciences*, 76(3), 443-468.
- Bergkvist, L., & Rossiter, J. R. (2007). The Predictive Validity of Multiple-item Versus Single-item Measures of the Same Constructs. *Journal of Marketing Research*, 44 , 175-184.
- Bogumil, J. & Ebinger, F. (2008). Verwaltungspolitik in den Bundesländern. Vom Stiefkind zum Darling der Politik. Die Politik der Bundesländer. StaatstätigkeitimVergleich. A. Hildebrandtand F. Wolf. Wiesbaden, *Verlag fürSozialwissenschaften*, 257-288.
- Bouckaert, G. (1998). Public Sector Performance Measurement in a Principal Agent Context. In *Inter and Intra Government Arrangements for Productivity, An Agency Approach*, ed. Halachmi, A., & Boorsma, P. Boston. Kluwer Academic Publishers, 137-145.
- Bouckaert G., & Van Dooren, W. (2003). Performance Measurement and Management in Public Sector Organizations. In *Public Management and Governance*, ed. Bovaird, T. & Löffler, E. London:Routledge, 127-136.
- Cronbach, L., Ambron, S., Dornbusch, S., Hess, R., Hornik, R., Phillips, D., Walker, D., & Weiner, S. 1980 'Toward Reform of Program Evaluation'. San Francisco: Jossey-Bass.
- de Lancer J., P. & M. Holzer. (2001). Promoting the Utilization of Performance Measures in Public Organizations: An Empirical study of Factors Affecting Adoption and Implementation. *Public Administration Review*, 61(6), 693-708.
- Franklin, A. L. (2000). An Examination of Bureaucratic Reactions to Institutional Controls. *Public Performance and Management Review*, 24(1), 8–21.
- Gardner, D. G., Cummings, L. L., Dunham, R. B., & Pierce, J. L. (1998). Single-item versus multiple-item measurement scales: An empirical comparison. *Educational and Psychological Measurement*, 58, 898-915.
- Grizzle, G. A., & Pettijohn, C. D. (2002). Implementing Performance-Based Program Budgeting: A System-Dynamics Perspective. *Public Administration Review*. 62 (1), 51-62
- Heinrich, C. J. (1999). Do Government Bureaucrats Make Effective Use of Performance

- Management Information? *Journal of Public Administration Research and Theory*, 9(3), 363-393.
- Hoggett, P. (1996). New Modes of Control in the Public Service. *Public Administration*, 74(1), 9- 32.
- Hood, C. (1991). A Public Management for All Seasons. *Public Administration*, 69, 3-19.
- Ingraham, P. W. (1993). Of pigs in pokes and policy diffusion: Another look at pay for performance. *Public Administration Review*, 53 (4), 348-356.
- Ingraham P.W., P.G. J., A.K. Donahue (2003). *Government Performance: Why Management Matters*. Baltimore: Johns Hopkins University Press
- Jensen, M.C., & W.H. Meckling. (1976). Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure. *Journal of Financial Economics*, 3(4), 305-360.
- Keating, M., "Quo vadis?: Challenges of public administration", 1989, *Australian Journal of Public Administration*, 48, 123-131.
- Læg Reid, P., P. G. Roness & K. Rubecksen (2006). Performance Management in Practice -the Norwegian Way. *Financial Accountability and Management*, 22 (3), 251-70.
- Læg Reid, P.& K.Verhoest (2010). *Governance of Public Sector Organizations: Proliferation, Autonomy, and Performance*. Houndmills. Palgrave.
- Melkers, J., & K. Willoughby. (2005). Models of Performance-Measurement Use in Local Governments: Understanding Budgeting, Communication, and Lasting Effects. *Public Administration Review*, 65(2), 180-190.
- Moynihan, D. P. (2005). What Do We Talk About When We Talk About Performance: Dialogue Theory and Performance Budgeting. *Journal of Public Administration Research and Theory*, 16(2), 151-168.
- Moynihan, D. P. (2008). *The Dynamics of Performance Management: Constructing Information and Reform*. Washington D.C.: Georgetown University Press.
- Moynihan, D. P., & P. W. Ingraham. (2004). Integrative leadership in the public sector: A model of performance information use. *Administration & Society*, 36,427-53.
- Moynihan, D. P., & N. Landuyt. (2009). How do public organizations learn? Bridging structural and cultural divides. *Public Administration Review*, 69,1097-105
- Moynihan, D. P., & S. K. Pandey. (2005). Testing how management matters in an era of government by performance management. *Journal of Public Administration Research and Theory*, 15,421-39.
- Moynihan, D. P. & S. K. Pandey. (2010). The Big Question for Performance Management: Why do Managers Use Performance Information? *Journal of Public Administration Research and Theory*, 20(4), 849-866.
- Norman, R. (2001). Letting and Making Managers Manage. The Effect of Control Systems of Management Action in New Zealand's Central Government. *International Public Management Journal*, 4, 65-89.
- Osborne, D. & T. Gaebler.(1992). *Reinventing government: how the entrepreneurial spirit is transforming the public sector*. New York, NY: Addison Wesley Publishing Company.
- Pandey, S. K., D. H. Coursey, & D. P. Moynihan. (2007). Organizational effectiveness and bureaucratic red tape: A multi-method study. *Public Performance and Management Review*, 30,398-425.

- Pollitt, C., Talbot, C., Caulfield, J., & Smullen, A. (2004). *Agencies. How Government Do Things With Semi-autonomous Organizations*. Basingstoke: Palgrave Macmillan.
- Pollitt, C. (2004). Theoretical overview. In *Unbundled Government*, ed. C. Pollitt and C. Talbot. London: Routledge.
- Pollitt, C. & G. Bouckaert. (2011). (3rded.) *Public management reform: a comparative analysis: NPM, governance and the Neo-Weberian State*. Oxford: Oxford University Press
- Poister, T. H., & G. Streib. (1999). Municipal Management Tools from 1976 to 1993: An Overview and Update. *Public Productivity and Management Review*, 18(2), 115–25.
- Pratt, J. W., & Zeckhauser, R. J. (1991). *Principals and agents*. Boston: Harvard Business School Press.
- Radin, B.A. (2006). *Challenging the Performance Measurement: Accountability, Complexity, and Democratic Values*, Georgetown University Press.
- Schulz, M. (2001). The Uncertain Relevance of Newness: Organizational Learning and Knowledge Flows. *Academy of Management Journal* 44(4), 661-681.
- Smullen, A., S. van Thiel & Chr. Pollitt. (2001)., Agentschappen en de verzelfstandigingsparadox. *Beleid en Maatschappij*, 4, 190-201
- Valkama, P.; Bailey, Steohen J. & Ari-Veikko A. (eds.) (2013). *Organizational Innovation in Public Services. Forms and Governance*. Basingstoke: Palgrave Macmillan.
- Van Dooren, W. (2005). What makes organizations measure? Hypotheses on the causes and conditions for performance measurement. *Financial Accountability & Management*, 21(3), 363-383.
- Van Dooren, W. & S. Van de Walle (ed). (2008). *Performance Information in the Public Sector: How it is used*. Palgrave: Basingstoke.
- Van Dooren, W., G. Bouckaert, & J. Halligan. (2010). *Performance Management in the Public Sector*. London: Routledge.
- Verhoest, K., G. B. Peters, G. Bouckaert, & B. Verschuere. (2004). The study of organisational autonomy: A conceptual review. *Public Administration and Development*, 24(2), 101-118.
- Verhoest, K. (2005a). The Impact of Contractualisation on Control and Accountability in Government Agency Relations: the Case of Flanders (Belgium) in G. Drewry, C. Greve & T. Tanquerel (eds), *Contracts, Performance and Accountability*, Amsterdam: IOS Press.
- Verhoest, K. (2005b). Effects of Autonomy, Performance Contracting, and Competition on the Performance of a Public Agency: a Case Study, *Policy Studies Journal*, 33 (2): 235-58.
- Verhoest, K., P. G. Roness, B. Verschuere, K. Rubecksen, & M. MacCarthaig. (2010). *Autonomy and control of state agencies: comparing states and agencies*. Hampshire: Palgrave Macmillan.
- Waterman, R. & K. J. Meier. (1998). Principal-Agent Models: An Expansion? *Journal of Public Administration Research and Theory* 8, 173-202.
- Walker, R., M., Boyne, G. A. & Brewer, G.A. (2010). *Public management and performance: Research directions*. Cambridge, UK: Cambridge Univ. Press.

6 Tables and figures

Figure 1 Visualization of the effect of managerial autonomy and result control on use of internal performance- based steering

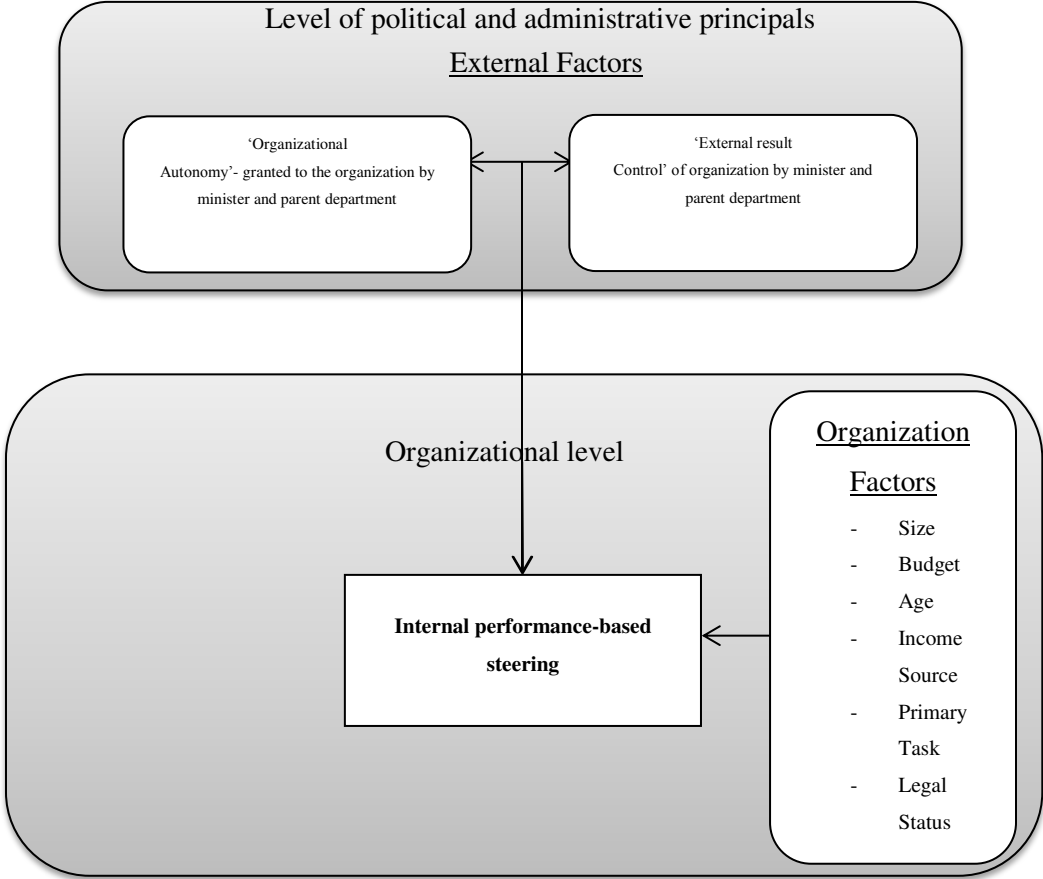


Table 1 Summary statistics

Variables			Original Sample*			Used sample (N=546)	
	Min	Max	Mean	Standard deviation	N	Mean	Standard deviation
Internal performance-based steering	0	2	1.215	0.637	820	1.238	0.613
Financial Management Autonomy	0	2	0.792	0.760	825	0.788	0.762
Personnel Management Autonomy	0	2	1.233	0.850	847	1.192	0.859
Result control	0	2	1.061	0.808	726	1.128	0.811
Dominant source of income	0	1	0.248	0.432	832	0.219	0.414
Measurability of task	0	1	0.583	0.493	817	0.570	0.495
Organizational age	0	2	1.036	0.817	1022	0.969	0.826
Organizational size	0	2	1.155	0.835	1023	1.022	0.821
Budget	0	2	1.252	0.846	1027	1.157	0.837
Type	0	1	0.544	0.498	1027	0.472	0.500
Countries included:							
Belgium	0	1	0.121	0.326	1027	0.174	0.379
Italy	0	1	0.040	0.196	1027	0.053	0.224
The Netherlands	0	1	0.201	0.401	1027	0.097	0.296
Hong Kong	0	1	0.061	0.240	1027	0.064	0.245
Austria	0	1	0.063	0.244	1027	0.082	0.275
Germany	0	1	0.071	0.257	1027	0.104	0.306
Portugal	0	1	0.151	0.358	1027	0.135	0.342
Romania	0	1	0.045	0.207	1027	0.062	0.242
Sweden	0	1	0.247	0.432	1027	0.229	0.420

* this sample was tested on its representativeness: see <http://soc.kuleuven.be/io/cost/index.htm>

Table 2 Correlation matrix (Spearman)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	
Internal performance-based steering	(1)	1									
Financial Management Autonomy	(2)	0.0453	1								
Personnel Management Autonomy	(3)	-0.0555	0.552***	1							
Result control	(4)	0.178***	0.0173	-0.0353	1						
Dominant source of income	(5)	0.0179	0.107**	0.170***	-0.0674	1					
Measurability of task	(6)	0.0896**	0.267***	0.134***	-0.0498	0.0674	1				
Organizational age	(7)	-0.0505	0.126***	0.140***	-0.0870**	0.0146	0.0882**	1			
Organizational size	(8)	0.150***	-0.0102	0.0408	0.0261	0.0882**	0.0908**	0.177***	1		
Budget	(9)	0.106**	-0.189***	-0.152***	0.138***	-0.0416	-0.0311	0.00178	0.507***	1	
Type	(10)	0.0579	0.157***	0.160***	-0.0317	0.198***	0.139***	-0.213***	-0.0253	-0.143***	1

* p<0.10, ** p<0.05, *** p<0.01

Table 3 Ordered Logit estimates (odds ratio's) for the use of internal performance-based steering (N=546)

Variables	Internal performance-based steering		
	A	B	C
Personnel Management Autonomy (None= reference category) (1)	$\chi^2(2)=2.44$	$\chi^2(2)=2.01$	$\chi^2(2)=2.76$
Some	0.896 (0.263)	1.653 (0.814)	0.912 (0.268)
High	0.618 (0.203)	0.870 (0.418)	0.605 (0.199)
Financial Management Autonomy (None= reference category) (2)	$\chi^2(2)=4.91$	$\chi^2(2)=5.94$	$\chi^2(2)=6.50^*$
Some	1.676** (0.436)	1.789** (0.471)	2.919** (1.244)
High	1.955** (0.640)	2.086** (0.688)	2.135 (1.091)
Result Control (None= reference category) (3)	$\chi^2(2)=18.21^{**}$	$\chi^2(2)=12.59^{**}$	$\chi^2(2)=14.31^{**}$
Some	1.803** (0.437)	2.618** (1.218)	2.388** (0.893)
High	2.849*** (0.699)	4.669*** (2.041)	3.955*** (1.458)
Interaction (1) &(3)		$\chi^2(4)=9.27$	
Some personnel management autonomy & some result control		1.434 (0.687)	
High personnel management autonomy & some result control		1.819 (0.862)	
Some personnel management autonomy & high result control		4.333*** (2.197)	
High personnel management autonomy & high result control		2.063 (0.957)	
Interaction (2) &(3)			$\chi^2(4)=22.78^{**}$
Some financial management autonomy & some result control			3.179*** (1.215)
High financial management autonomy & some result control			4.983*** (2.303)
Some financial management autonomy & high result control			5.494*** (2.118)
High financial management autonomy & high result control			6.171*** (2.917)
Dominant source of income	0.963 (0.214)	0.934 (0.205)	0.981 (0.220)
Measurability of task	1.232 (0.238)	1.196 (0.228)	1.263 (0.244)
Organisational age (young= reference category)	$\chi^2(2)=1.33$	$\chi^2(2)=1.32$	$\chi^2(2)=1.30$
Medium age	1.058 (0.242)	1.116 (0.253)	1.036 (0.238)
High age	0.812 (0.194)	0.774 (0.183)	0.804 (0.192)
Size	6.50e-05 (4.13e-05)	6.70e-05 (4.23e-05)	6.68e-05 (4.05e-05)
Organisational budget (low budget= reference category)	$\chi^2(2)=9.61^{**}$	$\chi^2(2)=8.26^*$	$\chi^2(2)=8.45^*$
Medium budget	2.003*** (0.506)	1.932** (0.497)	1.901** (0.488)
Large budget	2.017*** (0.527)	1.944** (0.517)	1.985*** (0.522)
Type	0.707 (0.223)	0.654 (0.203)	0.710 (0.224)
Country dummies	Included	Included	Included
Constant	0.389* (0.217)	-0.681 (0.597)	-0.786 (0.572)
Constant	11.73*** (6.660)	2.749** (0.611)	2.637** (0.585)
Observations	546	546	546
Pseudo R ²	0.1067	0.1124	0.11
% explained by country dummies	56.2%	53.3%	54.4%
McKelvey & Zavoina's R ²	0.219	0.23	0.225
McFadden's R ²	0.107	0.112	0.110
Log Likelihood	-446.403	-443.638	-444.824

Standard errors in parentheses ** p<0.01 & * p<0.05.

7 Notes

¹ Cronbach's alpha equals 0.707

² For more information, see: <http://soc.kuleuven.be/io/cost/survey/index.htm>. The different agency types and policy sectors are represented in a proportional way in the country-specific databases.

³ The Granger causality test is a statistical hypothesis test for determining whether one time series is useful in forecasting another. See: Greene, W. (2003), "Econometric Analysis", Prentice Hall.