Management Accounting Research 25 (2014) 271–283

Contents lists available at ScienceDirect

Management Accounting Research

journal homepage: www.elsevier.com/locate/mar

The appropriateness of tight budget control in public sector organizations facing budget turbulence

Tobias Johansson [a,*], Sven Siverbo [b]

[a] Örebro University School of Business, SE 70182 Örebro, Sweden
[b] Karlstad Business School, Karlstad University, SE 65188 Karlstad, Sweden

ARTICLE INFO

Keywords:
Management control
Tight budget control
Cost control
Budget deviation
Public sector

ABSTRACT

In the public sector, budget deviations are an important performance dimension. Because of political and institutional pressures, it is crucial that public sector organizations neither overspend, nor underspend. Budget deviations actualize the issue of tight budget control. In this article we hypothesize that when public sector organizations face budget turbulence, the implementation of tight budget control is a functional response that increases the likelihood of meeting budget targets. Our study, combining survey and archival data from 196 Swedish municipalities, confirms our hypothesis. If budget turbulence is substantial, public sector organizations benefit from tight budget control as they seek to control budget deviations, but if turbulence is only marginal, they can conduct activities in the same manner as last year and additional direction from tight controls has no effect on budget deviations. A more general contribution of the paper is the evaluation of the effect of environment and tight budgetary control fit on budgetary performance.

1. Introduction

Budgeting and budget control represent the central logic for planning, control, and accountability in public sector organizations. It remains so despite the general criticism of budget control in the accounting literature (Marginson and Ogden, 2005) and the beyond budgeting literature (Wallander, 1999; Hope and Fraser, 2003; Bourmistrov and Kaarboe, 2013). The rationale of public sector budgeting is that allocated resources are to be used for welfare (policy) purposes. If economic resources in the budget are not used and transformed into welfare services, the realization of political priorities is not completed and the public sector organization adds less value to citizens than politically intended. Thus, budget surpluses are signs of insufficient budget discipline with implications for democracy and welfare. However, this budget control-related problem is not the most common type. Rather, many public sector organizations face dire economic difficulties forcing them to reduce spending. This means cutbacks in budgets and subsequent challenges to comply with spending levels. Even if budgets are balanced before the fiscal year, the outcome may be a deficit; presumably due to a combination of tough budget targets and insufficient budget control. From a societal perspective, failure to control budget deviations is problematic.

Against this background, it is surprising how little research has been devoted to the design, use, and effectiveness of public sector budget control systems in controlling budgets and budgeting behaviour. Literature reviews of accounting research on budget control show an almost complete dominance of research on private sector organizations (Chapman, 1997; Hartmann, 2000; Chenhall, 2003). In a similar vein, according to a recent review of public sector budgeting research in the accounting

* Corresponding author. Tel.: +46 19303384; fax: +46 19332546.
E-mail addresses: tobias.johansson@oru.se (T. Johansson), sven.siverbo@kau.se (S. Siverbo).

http://dx.doi.org/10.1016/j.mar.2014.04.001
1044-5005/

and public administration literature, research on budget control-related outcomes is non-existing (Anessi-Pessina et al., 2012). The accounting research still conducted on public sector budgeting has historically dealt with budgeting and budget controls in connection with accounting changes (the New Public Management movement) and implementation at the sector level (Anessi-Pessina et al., 2012) and in budgeting decision-making processes (e.g., Wildavsky, 1975; Jönsson, 1982; Boland and Pondy, 1986; Covaleski and Dirshmit, 1988). With the contextual framing of global economic turbulence and fiscally stressed public sector organizations in mind, we aim to redress the lack of budget control research in the public sector by focusing on the role of tight budget control for controlling budget deviations in organizations facing environmental economic turbulence in the form of changing budgets. The new economic circumstances mean that public sector organizations need to amplify and refocus their budget control activities towards goal achievement. The new spending limits, prioritizations, and performance levels increase the need for direction on how to perform and what is important. Tight budget control is argued to be a structure that facilitates these needs.

In addition to creating knowledge about the suitability of budget controls in public sector organizations this paper adds to the literature on the appropriateness of budget control systems in turbulent environments. Previous research on private sector organizations has shown that budget emphasis and reliance on formal budget controls is appropriate in turbulent environments (Khandwalla, 1972; Otley, 1978; Ezzamel, 1990; Gosh and Willinger, 2012). In these studies the researchers make the (implicit) assumption that only organizations that are aligned with their environment survive (exist to be observed) and that a relationship between environmental characteristics (independent variable(s)) and the budget control system (dependent variable) is indicative of a *selection type* of contingency fit (Drazin and Van de Ven, 1985; Chenhall, 2003; Gerdin and Greve, 2004). Thus, previous studies have only assumed a performance effect, but not explicitly tested for it. Furthermore, when applying the selection type of fit, performance is of a global character (market survival) rather than the more direct outcome of a budget control system such as budgetary performance. With an *interaction type* of contingency fit approach, it is possible to directly test the effect of fit between turbulence and budget control on budgetary performance. This approach allows evaluating if organizations that use tight (formal and extensive) budget controls when facing environmental turbulence have better control over their budgets *vis-à-vis* organizations that do not. Such knowledge is of interest from both a theoretical and practical perspective.

However, moving away from the selection type of contingency studies to interaction type studies means that we need to argue for a case where misfit combinations are likely to exist (i.e. are not weeded out effectively by the environment). Like Johansson (2013), we believe that the public sector is a good setting to test interaction type of contingency theories. The public sector is characterized by the lack of a competitive market, conflicting demands, presence of non-trivial input rigidities and a democratic and political process. Time lags and choices informed by non-economic incentives will lead to a situation where one can expect to find misfit adaptations (Johansson, 2013). In combination with strong institutional and political pressures for budget compliance (performance) in these organizations, it is reasonable to assume that they strive for environmental adaptation, but that one will find variation in adaptation (fit) that can be related to budgetary performance. Studying the importance of a proper alignment between environmental turbulence and budget design for budgetary performance in public sector organizations thus represents an interesting case for developing the contingency-based literature on budget control design in turbulent environments.

By investigating the appropriateness of tight budget control in public sector organizations, we also respond to the general call for more research on the intended and positive effects of budget control; rather than focusing only on the dysfunctions of budget controls (Hartmann, 2000; Marginson and Ogden, 2005). The lack of studies on budget control related outcomes within the public sector might be one reason for this bias in the literature. In most research on private sector organizations the control problem is one of spurring motivation to perform better (e.g. maximize profit or sales) and in such cases tight budget controls may be demotivating and ineffective. For some organizations, though, the need for predictability and control is as important as minimizing potentially dysfunctional behavioural effects of budget controls (Hartmann, 2000; Van der Stede, 2000). Public sector organizations facing political and institutional pressure for budget compliance is such an example. Testing hypotheses about the appropriateness (performance effects) of tight budget control in a public sector setting thus contributes to our understanding of the importance of tight controls for cases where predictability and control is an important control problem.

Next we review the accounting and control literature on the relationship between tight budget control and budget deviations in turbulent environments and propose a hypothesis on the relationship between these constructs. Then we present our sample, constructs, and measurements. In the penultimate section, we test the hypothesis and analyse our findings. The article concludes with a discussion of its main contributions.

2. Hypothesis development

We see turbulence as the amplitude of change in the environment that an organization is resource dependent on (cf. Boyne and Meier, 2009; Boyed et al., 1993). Since we are interested in public sector organizations' adaptability to changing economic conditions, we focus on *budget turbulence*. Budget turbulence in this setting means substantial changes in available resources–the budget–from one year to the next (Boyne and Meier, 2009). The budget in public sector organizations represents the available resources for policy and services and reflects macro and micro economic environmental developments (taxes, interest rates, service fees, etc.). The aggregate effect that changes in these conditions (the environment) have for resource availability in a particular public organization is reflected in its budget.

Significant budget turbulence breaks the strong norm of incrementalism in public sector organizations and causes a control challenge (Boyne et al., 2000; Boyne and Meier, 2009). In these organizations, budget turbulence should be seen as an important part of the wider theoretical construct of environmental turbulence (Boyne and Meier, 2009) and corresponds to changing competition, customer demand, credit availability, and interest rates in the private business sector (Khandwalla, 1972, 1977; Boyed et al., 1993).

In economic terms the responsibility of public sector organizations is to try and make sure that the difference between budgeted costs and actual costs is zero, that is, to ensure that no more or no less than budgeted resources are consumed during the fiscal year. This makes the control situation different from the private sector setting, which most contingency studies are based on (Chapman, 1997). In public sector organizations, the budget is the result of political negotiations and prioritizations and thus an expression of the will of the ruling politicians and indirectly the will of the people (this argument holds for most existing democracies). In some countries, it is illegal for public authorities to have higher costs than revenues (e.g. the Municipal Act of Sweden, 1991) but also in the absence of such legislation the budget is imperative due to the rules of the game in a democracy (Downs, 1957; Wildavsky, 2001) and to the informal norms of budgeting (Hou and Smith, 2010). Consequently, it is illegitimate and–in some countries–illegal to spend more resources than has been approved in the budget. This means that there is a coercive pressure in (and on) public sector organizations not to exceed budgeted spending limits.

At the same time there are little or no incentives to produce budget surpluses.[1] From a democratic and normative standpoint under-spending is as illegitimate as overspending since politically allocated resources are meant to be used for welfare and policy purposes during the fiscal year. Due to political and institutional pressures under-spending is often counteracted and something that responsible politicians and managers try to avoid. If allocated funds are saved and not used for the intended purposes there are reactions from the media, the wider public and the advocates, i.e., activity-oriented politicians and managers, clients, interest groups, and employees (Wildavsky, 1975). Ultimately, under-spending can lead to a debate on whether the particular public sector organization actually has too much funding, and such a debate is not something that the central management in a public sector organization would gladly invite. Therefore, in some situations funds are spent even when it would have been wiser to save them for future contingencies. There are political and coercive pressures against budget deficits and political and institutional pressures against budget surpluses. Consequently, one important budget performance dimension for central management in public sector organizations is to avoid (control) budget deviations.

The pressures and incentives to counteract budget deviations put budget control in focus. The goal of budget control is to ensure that agents follow their scripts (Macintosh and Quattrone, 2010) regardless if the script commands expansion or contraction. The purpose of budget control is to direct (encourage, enable and force) organizational members to act in the best interest of the organization (Merchant and Van der Stede, 2012). In generic terms this direction is accomplished through setting budget targets (spending limits in cost centres), evaluating budget variances and (implicit or explicit) rewarding good performance. Whether this "cybernetic" process should be tight or loose has been a long standing focus of research (Van der Stede, 2001).

Tight budget control is a composite of the intensity and scope by which managers exert control to increase the likelihood of budget attainment (Merchant and Van der Stede, 2012). The construct of tight budget control has been conceptualized as present if central management emphasizes meeting the budget, does not accept budget revisions, has a detailed interest in specific budget line items, does not tolerate deviations from interim budget targets and is intensively engaged in budget-related communications (Van der Stede, 2001). The tightness of the budget control system, or Tight Budget Control, is a choice variable in the hands of responsible politicians and managers.

Tighter budget control, however, also means increased control system costs (Hartmann, 2000; Merchant and Van der Stede, 2012). There are direct costs for the control system and for the amount of management time and effort it requires, and there are indirect costs in the shape of undesirable side effects such as slack creation, short-term thinking, job-related tension and negative attitudes (Hartmann, 2000; Van der Stede, 2000). Therefore politicians and managers may be reluctant to implement tight controls. Tight controls are justified only when the control of costs (the budget) are held to be as important or even more important than minimizing potential dysfunctional side effects of tight controls (cf. Hartmann, 2000).

A reason for assuming a contingent rather than universal association between tight budgetary control and budget deviations is that the situation at hand may call for more or less tightness in budget control. The key to understanding this contingent effect is likely the differentiated need for giving direction in organizations (Simons, 1987; Jaworski et al., 1993; Marginson and Ogden, 2005). In a public sector organization that faces substantial budget turbulence it is likely that the problem of goal incongruence between central managers and department managers increases or is vitalized. Wildavsky (1975) points to the inherent conflict between guardians (central managers) and advocates (department managers) in public sector budgeting. Since budget turbulence means that goals and spending limits need to be adjusted and that prioritizations need to be done, it is likely that the opinion among central managers and department managers will differ on what is the primary objective of the organization. Is the objective to cope with the new budget at any cost or should

[1] On the national level and EU-level the need for and role of budget surpluses have been discussed. Some countries have implemented a positively balanced budget rather than just a balanced budget to increase their financial stability and strength. It simply means macroeconomic saving rather than consumption. This is however implemented in the national budget and does not mean that a surplus in the relation between available and consumed funds for the particular public sector organization is the goal. They are still assumed to just break even.

department managers also pay attention to the effects that it may have on other missions and objectives of the organization? How should potentially additional resources be allocated? To deal with such goal incongruence problems central management needs to more firmly direct department managers in order to control and reduce potentially conflicting objectives. If central management emphasizes meeting the budget, does not accept budget revisions, has a detailed interest in specific budget line items, does not tolerate deviations from interim budget targets and is intensively engaged in budget-related communications, this forces (directs) department managers to be better aligned to organizational objectives.

In situations of low or non-existing budget turbulence where the budget process and its outcome is characterized by incrementalism, the need for and outcome of tight budget control is most likely different. Low budget turbulence means that the organization only marginally departs from the spending level of the previous year (Boyne et al., 2000). Previous studies on public sector budgeting show that incremental changes create a sense of certainty while turbulence creates uncertainty that has to be dealt with (Wildavsky, 1975). When there is low budget turbulence, the potential problem of goal incongruence is less vital since there is a form of balance and truce amongst key constituents in the organization. If the same procedure as last year is repeated, this does not threaten the resource and power balance in the organization and central management can feel quite confident that their efforts to control the budget are sufficient. This truce (cf. Nelson and Winter, 1982, on routine behaviour) also lessens the need for direction by the budget control system as such (Merchant and Van der Stede, 2012). Therefore low budget turbulence means a different control situation compared with a turbulent situation. Since the budget only changes slightly, organizations may more or less continue with their operations in the same manner as the previous year. The need for and effect of added direction through tightening the budget control system would likely be non-existent. However, due to increased control systems costs, tight budget control could even worsen budget performance. The risk of this outcome, however, should not be exaggerated since there are not many substantial and direct out-of-pocket costs involved in tightening budget control. Moreover, it cannot be ruled out that possible costs for tight budget control are planned and therefore included in budgeted costs. In this case, it would not be expected to affect budget deviations.

The rationale of these arguments for the relationship between budget turbulence and the need for tight controls is in agreement with previous studies that have investigated similar relationships for private sector organizations (Khandwalla, 1972; Otley, 1978; Ezzamel, 1990; Gosh and Willinger, 2012). In our case, an interaction specification of the relationship between constructs implies that it is reasonable to assume that tight budget control only has an intended (positive) effect on controlling budget deviations when budget turbulence is significant, that is, the effect of tight budget control on budget deviation is contingent upon the magnitude of budget turbulence. We thus pose the following hypothesis to be tested:

Hypothesis. In situations of significant budget turbulence the use of tight budget control lessens budget deviations.

3. Method

3.1. The setting

We test our hypothesis on the budget control of costs (spending) in Swedish municipalities. In these municipalities, in which budgets play a central role, the ability to control costs and to meet budget targets is crucial. Swedish municipalities are legally required to present a balanced budget and have to replenish any deficits within a three year period (The Municipal Act, 1991). The annual budget may vary between years since revenues (mainly income taxes, but also services fees) and costs change over time depending on the macroeconomic situation and the demand for services. Furthermore, the budget is used to implement policies that may vary with political change (budgets may expand or contract depending on the ideology and political programme of the governing parties). This means that municipalities can face substantial budget turbulence, i.e., changes in their economic conditions between years.

Our study aims to examine the importance of tight budget control in managing budget turbulence in the municipalities. Since all municipalities have the same function and mission in the Swedish welfare state, in general they face similar environmental uncertainty (at the macro level), have similar task characteristics, and use similar technology. These are factors that have been shown to explain variance in, or interact with, the constructs under study (Hartmann, 2000).

3.2. Sample and data

Our data set consists of a combination of survey data and archival data from Swedish municipalities. In late 2009 we sent a web-based questionnaire to the chief financial officers ($N = 290$, one per each municipality) in order to measure the level of tight budget control (see Van der Stede, 2001) imposed by central management in the organization. The response rate, after two follow-ups, was 82 per cent ($N = 239$). One explanation for this comparatively high response rate may be that the sending research institute is well known by the chief financial officers. Our comparison of the last 15 per cent of responses with the other responses revealed no statistically significant differences (on all questions). This indicated that there was no non-response bias. We used archival data for all other variables in the study. By combining the survey and archival data for the independent and dependent variables, we mitigated the common-method bias problem (Podsakoff et al., 2003) that is often a limitation with survey studies in accounting research. Since municipal budget data are not reported in national databases, we collected budget data from each municipal annual report. These data were collected in the first half of 2010. Two research assistants assembled the annual reports, searched for budget data and built a database. In the summer of 2010, one of the authors crosschecked the database. The fact that three persons have

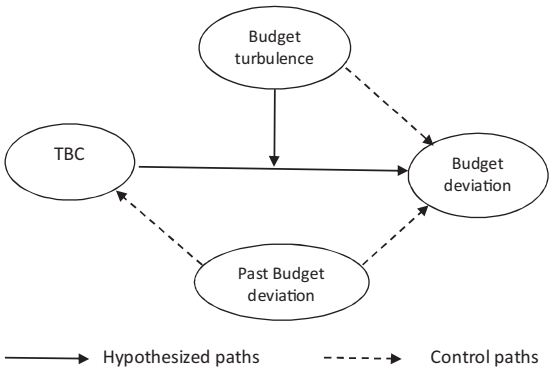

Fig. 1. Graphical representation of relationships between constructs. *Note*: TBC = Tight budgetary control

independently checked the database means that there is a low risk of coding errors.

Due to missing information on budgeted costs (the municipalities are not required to disclose budget numbers in their annual reports) and several apparent errors (extreme/nonsense values of budgeted costs or actual outcomes) in the annual reports, we were able to match archival data for 211 of the 239 completed questionnaires. This gave us an effective response population of 73 per cent. Item non-responses are generally very few (below 1 per cent on all observations) and a missing value analysis shows a non-significant result (Little's MCAR test[2] $p = 0.437$), which means that list-wise deletion is advisable for handling missing values (Hair et al., 2010). The list-wise (complete data) number of observations used in the following empirical analyses is 196. The median municipality in the sample has an annual turnover of 818 million Swedish crowns (about 93 million euro) and employs 1114 full-time equivalences.

3.3. Control variables and model specification

Although the focus (the hypothesis) in this study is on the contingent effect of budget turbulence on the relationship between tight budget control and the dependent variable budget deviation, we also control for the potential effect (paths) that budget turbulence may have on budget deviation. Thus, we also control for the hypothesis that there actually is a direct relationship between budget turbulence and the level of budget deviation (cf. quasi-moderation: Sharma et al., 1981).

In the general budget literature there is extensive research on the connection between budget control and various outcome and performance variables. However, in this research there are often problems of endogeneity since the performance variables, in particular, have also been identified as important antecedents to budget design in organizations (Merchant, 1985; Otley, 1980; Van der Stede, 2000). According to the (inconclusive) budgeting literature, the hypothesis that a poor performer (large budget deviation) would benefit from tightening the budget control is a priori as valid as the hypothesis that organizations with tight budget control have less budget deviation. Therefore, we also control for the effect (path) of past budget deviation $(t-1)$ to control for the temporal stability of the current budgeting performance, for the existence of slack (Van der Stede, 2000) and for the effect on the variability in tight budget control. Including a lagged dependent variable also contributes to the problem of controlling for omitted variables. Since potentially omitted variables would also likely be related to previous budget performance, including a lagged dependent variable serves to control for this (Boyne and Meier, 2009). Fig. 1 is a graphical representation of the hypothesized paths (full arrows) and control paths (dotted arrows) of our model.

3.4. Constructs, variables, and measurements

Tight budget control is operationalized and measured by the second order reflective construct developed by Van der Stede (2001). Van der Stede developed this construct by synthesizing the previous literature in order to conceptualize tight budget control in a more ambitious and complete way. Earlier concepts and constructs related to tight budget control, such as the evaluator style (Hopwood, 1972), feedback (Hirst and Lowy, 1990), budget emphasis (Dunk, 1993), and links with extrinsic rewards (Merchant, 1985), were criticized as too narrow in scope since they explain only parts of the actual and much broader tight budget control construct (Van der Stede, 2001).

Van der Stede (2001) originally proposed the second order construct to consist of five lower order elements based on the literature. Van der Stede identified the following elements of the tight budget control construct: (p. 124):

In sum, tight budget control is held to exist if central management:

(1) Puts much emphasis on meeting the budget;
(2) Does not easily accept budget revisions during the year;
(3) Has a detailed interest in specific budget line items;
(4) Does not lightly tolerate deviations from interim budget targets; and,
(5) Is intensively engaged in budget-related communications.

After operationalizing these elements as a measurement instrument (a questionnaire) and analysing the first and second order construct reliability and validity, Van der Stede found that only four of the originally proposed elements reflected tight budget control in a uniform manner. According to Van der Stede, the element of budget revisions during the year does not reflect tight budget control. For that reason, we excluded this element from the concept of tight budget control. In all other instances we replicated Van der Stede's proposed construct of tight budget control and adopted his proposed 20 questionnaire items (although Van der Stede noted that only 13 items were psychometrically valid in his setting). The general structure of the tight budget control construct, including the non-relevance of the revision element, has been reproduced in a public sector setting (Nylinder, 2009),

[2] The missing values are randomly distributed.

Table 1
Descriptive statistics for the archival measures.

	N	Minimum	Maximum	Mean	Std. deviation
Budget deviation	196	−0.051	0.059	0.004	0.018
Budget turbulence	196	−0.092	0.048	−0.021	0.026
Past budget deviation	196	−0.045	0.039	−0.004	0.015
Budget deviation (abs)	196	0.000	0.059	0.014	0.011
Budget turbulence (abs)	196	0.000	0.090	0.027	0.020
Past budget deviation (abs)	196	0.000	0.045	0.013	0.010

which shows that the construct is generalizable across the public–private contexts.

In his empirical analyses (of the instrument), Van der Stede asked business unit managers how they perceived the budget control imposed on them. Our level of analysis is the municipality organization as a whole. Therefore, we asked the chief financial officers in each municipality how they perceived the budget control imposed by top politicians and managers on the departments. Although our setting is similar to Van der Stede's in many respects–they are both examples of large organizations relying heavily on budgets for planning and control–our public sector setting and level of analysis required us to modify some questions to improve face validity (Kwok and Sharp, 1998).[3] After testing the questionnaire on five practitioners and experts in public sector accounting and finance, we made some additional changes in wording and terms. Our questionnaire appears in Table A1 in the Appendix. All questionnaire items were randomly ordered.

Budget deviation: Our dependent budget performance variable is budget deviation, i.e. a comparison between the budget and outcome. Each municipality's cost budget for 2009 is divided by its actual costs for 2009. A positive budget deviation means that the costs (outcome) were lower than the budget. A negative budget deviation means the actual costs were higher than the budget.

Past budget deviation is consequently measured by relating the budget for 2008 with the actual outcome for 2008 divided by the actual costs for 2008.

Budget turbulence: The practice in the empirical work on environmental turbulence and budget controls in private sector organizations is to measure environmental turbulence by self-perception measures of the amplitude and frequency of environmental pressures (e.g. Khandwalla, 1972, Ezzamel, 1990). If theory is about perceptions and individual mind-sets then this practice is valid (Downey and Slocum, 1975; Boyed et al., 1993). However, almost all of the studies that we refer to, including our own, are structural contingency studies focused on the organizational level. This means that the use of individual perceptions, and most likely also misperceptions, of the environment is not as relevant and valid as using objective measures. Since structural contingency theory is about organizations' adapting to their environment (Donaldson, 2001), theoretically, a turbulent environment is a turbulent environment regardless of how individuals (respondents) perceive it. Thus, and in accordance with Gosh and Willinger (2012), we use an objective classification of budget turbulence, which is the aspect of the environment of interest in the study. The budget turbulence variable is computed by taking each municipality's actual costs for 2008 subtracted from its budgeted revenues in 2009. To obtain a relationship (per cent), the difference is divided by the cost for 2008. Arguably, since this measure captures the difference between previous costs and accessible economic resources, it is a valid measure of budget turbulence. The measure is a negative value if the budget is expanding and a positive value if it is decreasing.

Budget turbulence, budget deviation and past budget deviation are expressed both in real numbers and in absolute values (disregarding signs). Table 1 presents the descriptive statistics for the three archival measures.

4. Results and analysis

We estimated our measurement model and our structural model using a partial least squares (PLS) approach (Lohmöller, 1989; Wold, 1982). The major reason for using PLS instead of covariance-based structural equation modelling is model complexity in relation to sample size. If we had used covariance-based structural equation modelling with a sample of just below 200, we would have been able to estimate only about 10 free parameters in a reliable manner (Klein, 2011). With our construct of tight budget control and additional structural paths, we would have needed > 500 cases (assuming the proposed ratio of 20 cases per free parameter; Klein, 2011). Since the population contains no more than 290 units of analyses in total, covariance-based structural equation modelling was not an option. Parcelling the second order construct (Bagozzi and Edwards, 1998) would not have helped. PLS structural equation modelling has been shown to be effective for making predictions with much smaller sample sizes (about 100) (Reinartz et al., 2009) and has been applied frequently in accounting research for handling latent variables and structural models (e.g., Hall and Smith, 2009; Hartmann and Slapnicar, 2009; Van Rinsum and Verbeeten, 2012). Recently it has been proposed that hierarchical constructs, such as the tight budget control construct, are better assessed with PLS structural equation modelling than with covariance-based methods since PLS is less sensitive to model complexity (Wetzels et al., 2009). In addition to PLS, we also used OLS regression to include special tests of interaction effects that are not available with the SmartPLS 2.0 software (Ringle et al., 2005).

Before testing the structural model(s), we first fitted the measurement model of tight budget control for internal reliability and convergent and discriminant validity by computing composite reliability and average variance extracted (AVE) measures for the four first order constructs

[3] The questions were adapted to the terms and the structure used in the budget process in Swedish municipal government.

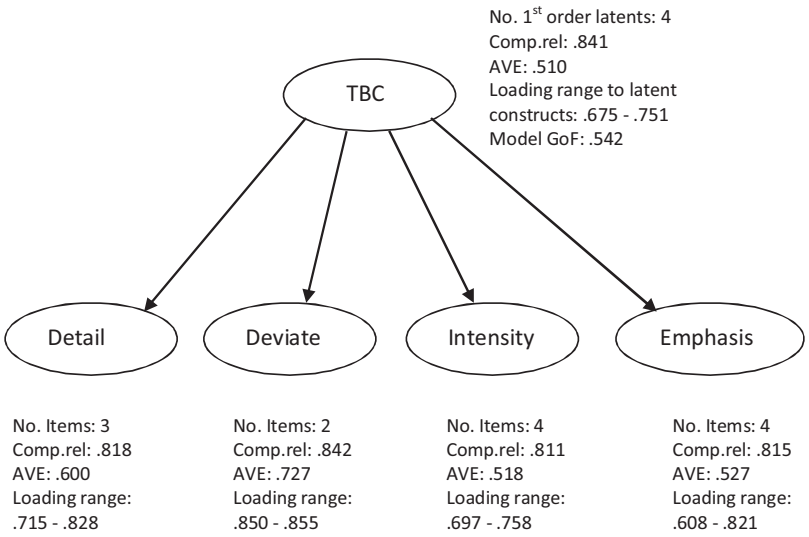

Fig. 2. The measurement model for the second order latent construct of tight budget control (TBC). *Note*: TBC = Tight budgetary control

and for the second order construct of tight budget control. In both cases, a composite reliability of > 0.7 and an AVE > 0.5 (Hair et al., 2010) indicate that the indicators of the constructs are highly inter-correlated and converge. Discriminant validity was assessed by comparing the square root of the AVE with the correlations between the first order constructs (Fornell and Larcker, 1981). In addition we also computed the recently suggested goodness of fit measure of GoF (Tenenhaus et al., 2005) that is suitable for reflective models. A GoF above 0.36 has been suggested as indicating a model with good (large) fit (predictive/explanatory power) (Wetzels et al., 2009). The second order construct level of tight budget control was operationalized using the repeated indicators approach (Wetzels et al., 2009). Because Van der Stede (2001) was exploratory in establishing what measures to use as indicators for the four first order latent constructs and because there is no consensus on which or how many items to use, we followed Van der Stede's procedure. Thus, in exploring the factors of the first order constructs in a first step, we excluded items loading below 0.6 in order to a priori enhance the validity of the measurement model of tight budget control.[4] Since all items are supposed to be representative of the common latent structures they represent (i.e., they are reflective and not formative constructs), this does not change the nature of the construct/measure conceptually (Jarvis et al., 2003). This leads to the use of 13 of the originally proposed 20 items. Table A1 in the Appendix presents these 13 items. All constructs show acceptable levels of composite reliability and convergent validity. The model as such has a large GoF (0.542).[5] Table A2 in the Appendix shows the correlations between constructs, all of which fall below the lowest square root of AVE (0.725), indicating discriminant validity. All paths were highly significant ($p < 0.001$/T-value > 2.58) using bootstrap re-sampling with 5000 samples. The measurement model of tight budget control is presented in Fig. 2.

To test our hypothesis and our structural model that includes an interaction effect, we used a two-stage approach (Henseler and Chin, 2010). This approach has the advantage of reducing the number of variables significantly compared to the more commonly used repeated indicators approach for interactions (included as a default in the SmartPLS software). Thus, the approach results in higher predictive power for small and medium sized samples. Simulation studies have confirmed this (Henseler and Chin, 2010). First, we estimated a model that includes the proposed main and direct effects of variables (including control paths) and saved the latent scores of the variables. In a second step, we then estimated the same model but with the added interaction between budget target difficulty and tight budget control using only the latent scores of each variable. These two steps are presented in Table 2.

[4] Van der Stede used 0.4 as a cutoff. We use a somewhat higher cutoff since we use PLS and principal component analysis and not the maximum likelihood. Maximum likelihood is a more conservative estimation technique. Furthermore, we are not able to control for measurement error (shared variance) as is possible with covariance-based structural equation modelling. Therefore we had to add more quality criteria to the measures in the first step of evaluating the measurement model before testing the structural model. This is the major reason why our study uses fewer indicators than Van der Stede's gross model proposal of 20 items (loading above 0.4). If Van der Stede had used 0.6 as a cutoff, as he suggested, he also would have used 13 valid indicators. Van der Stede did not assess convergent validity by calculating AVE. From his disclosed factor analyses, these can be calculated in hindsight. It is apparent that Van der Stede would have had to drop a couple more indicators to get AVEs above 0.5 for all four elements and the second order construct of tight budget control (pp. 127–132). Consequently, Van der Stede's final construct of tight budget control includes more unexplained variance than explained variance (AVE of 0.487). We conclude that the risk of having a less valid (noisy) construct of tight budget control in the structural analyses outweighs the exclusion of items in the measurement model. When exploring the first order constructs with PLS, we applied the method of linking a formative construct with the same indicators to the reflective construct. As a robustness check, we also applied principal component analysis using SPSS (19).

[5] The GoF was computed by taking the root of the mean redundancy index (communality × R^2) (Tenenhaus et al., 2005) for the four first order level constructs.

Table 2
PLS structural regression models.

Model 1: Baseline model with *original scores*.			**Model 2:** Interaction model with *latent scores*.	
From	To	To	From	To
	Budget deviation	TBC		Budget deviation
TBC	−0.004	–	TBC	0.004
Budget turbulence	−0479***	–	Budget turbulence	−0.497***
Past budget deviation	0.131	0.008	Budget turbulence × TBC	0.173**
			Past budget deviation	0.112
R^2	0.321	0.000	R^2	0.355

Significance levels for 5000 bootstrap samples. Standardized regression weights displayed.
*< 0.05 sig., ** < 0.01 sig., *** < 0.001 sig., N = 196, TBC = tight budget control.

The PLS structural regressions using the original scores (Model 1 in Table 2) and variables measured in real numbers show that it is only budget turbulence that has an evident statistically significant path on the level of budget deviation. When budget turbulence comes in the shape of contraction, it increases negative budget deviations. Conversely, when budget turbulence is about expansion it causes positive budget deviations. The degree of tight budget control has no direct effect (path) on the level of budget deviation. None of the control paths to tight budget control is statistically influential. Tight budget control and budget turbulence are almost perfectly uncorrelated (r = 0.03)(untabulated analyses).

In Model 2 we only present the paths to budget deviation using the latent scores of variables from Model 1. The variables of the interaction were mean-centred according to the normal practice in research (Hartmann and Moers, 1999). As shown in Model 2, the interaction term is positive and statistically significant. This does not necessarily mean that our hypothesis of the contingent effect is corroborated but only that the regression line is geometrically different for different values of budget turbulence (or tight budget control). To further test our interaction fit hypothesis, we applied simple slope tests (Cohen et al., 2003) and calculated regions of significance for the interaction effect to see in which regions (differences in slope) the focal effect is evident (statistically significant) (the Johnson–Neyman method), using the MODPROBE macro (Hayes and Metthes, 2009). In addition, we also performed a hierarchical regression and test for the change in the explained variance of the interaction term. We used the latent scores (PLS) as shown in Model 2 and OLS regression to perform these tests.

Since we have no theoretical tool to divide the budget turbulence measure into the groups that we specified in the hypothesis, we followed the normal procedure of testing for the difference in the effect of tight budget control on budget deviation for levels of −1/+1 standard deviation and the mean of budget turbulence (Hayes and Metthes, 2009) that represent categories of different budget turbulence. To assess the empirical robustness of this approach, we also disclosed the regions of significance for the effect of tight budget control for different values of budget turbulence. We do not use this method to define effect size (Hartmann and Moers, 1999) but only to explore cut-offs for form (non-monotonic) differences (Hayes and Metthes, 2009). Table 3 shows the results of these tests.

The regressions from Table 3 show that there is a statistically significant change in R^2 when introducing the interaction term and a change in sign (form) of the coefficient of tight budget control on budget deviation for different values of budget turbulence. For values one standard deviation below the mean of budget turbulence (i.e., expanding cost budgets), the effect of tight budget control on budget deviation is negative. For values one standard deviation above the mean of budget turbulence (i.e., contracting budgets), the effect of tight budget control on budget deviation is positive and significant. The Johnson–Neyman regions of significance show that tight budget control has a significant negative effect on budget deviation for values of −0.041 and below of budget turbulence, and that tight budget control has a significant positive effect on budget deviation for values above −0.002 of budget turbulence. For values between these two limits, the effect is non-significant (both statistically and practically). These limits represent about 21 per cent (lower end) and 20 per cent (higher end) of the observations (N = 196). We regard this as a reasonable amount of the population (41 per cent) and not just as a few cases at the very extreme values of the regression line. We consider this as an indication that we can observe a change in sign (form) of the conditional effect of tight budget control and that the effect is contingent upon the level of budget turbulence. This is further supported by the fact that the higher level confidence interval of −1 std.dev. effect does not overlap with the lower level confidence interval of the +1 std.dev effect. In Fig. 3 we plot the partial derivatives of the regressions in Table 3 using unstandardized latent

Table 3
Simple slope tests (OLS) of tight budget control (TBC) on budget deviation for different values of budget turbulence (using latent scores).

Value of budget turbulence	Effect of TBC on budget deviation (coefficient)	p-Value	Lower level CI (95%)	Higher level CI (95%)
−1 std.dev	−0.195	0.022	−0.362	0.028
Mean	0.004	0.938	−0.111	0.111
+1 std.dev	0.204	0.022	0.030	0.378

R^2 change statistics of the interaction term: R^2delta = 0.033; F = 9.84; p = 0.002. Johnson–Neyman regions of significance (alpha 0.05): <−0.041 and >−0.025. Unstd. values. N = 196.

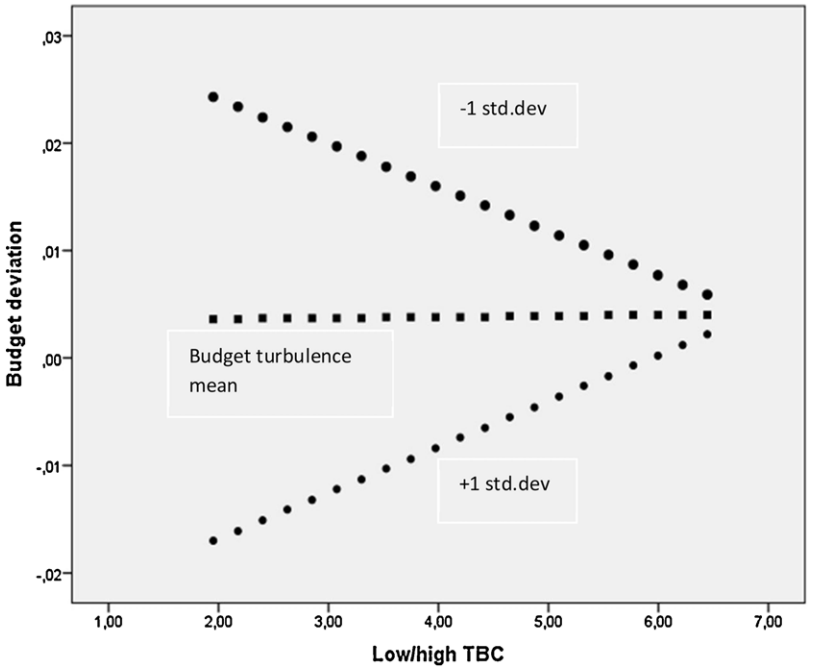

Fig. 3. Partial derivatives plots of the contingent relationship between tight budget control (TBC) and budget deviation for different values of budget turbulence.

variable scores showing the practical effect in reduced budget deviation of tight budget control.

From Table 3 and Fig. 3 it is evident that our interaction fit hypothesis is supported. The effect of tight budget control on budget deviation is dependent on the level of budget turbulence. This is true for both extremes of budget turbulence. For municipalities with highly expanding budgets, tighter control leads to less positive deviations (just above zero). For municipalities with contracting budgets, tighter budget control leads to less negative deviations, eventually to just above zero. For the majority of municipalities that face no or low (mean) budget turbulence we cannot observe any effect on budget deviation from tight budget control. This is consistent with our prediction. Tight budget control reduces budget deviation only for organizations experiencing significant budget turbulence.

Looking at the values of budget turbulence, the positive effect is evident for every observation that has about a zero (−0.002) or higher value of budget turbulence. This means that for every municipality that has a budget that is less than the actual spending from the previous year (a cut in spending), the effect of tight budget control is evidently positive. The other end value of budget turbulence, where an effect of tight budget control is traceable, lies quite a bit below zero (−0.041). This means that the effect of tight budget control is only traceable for cases that have about four per cent or more of extra funds compared to actual spending in the previous year. In empirical terms, this is what is meant by significant budget turbulence. Since the budget turbulence measure compares information from two different time (years) periods, it should be noted that the actual (real terms as opposed to nominal terms) difference (value of budget turbulence) should probably be adjusted downward a bit. Between 2003 and 2010, the mean annual increase in spending for the municipalities was 3.9 per cent (Statistics Sweden, 2011) indicating, due to inflation, that a slightly negative value of the budget turbulence measure could be the norm at an aggregated population level. This, for example, means that the +1 std.dev group in real terms is implementing somewhat tougher budgets than the measure of budget turbulence suggests and that the −1 std.dev group does not expand precisely as much as the measure suggests. This does not, however, disprove our measure or results since the relative end points are the same. Relatively, there are municipalities that face more budget turbulence than others and there is enough variation to detect both high and low turbulence.

Furthermore, it is evident from Table 2, the plot in Figure 3, and from the regressions in Table 3 that budget turbulence not only moderates the effect of tight budget control, but that it also has an individual main effect. Municipalities with budget turbulence in the shape of expanding budgets are more likely to have positive budget deviations and municipalities with contracting cost budgets are more likely to have negative budget deviations. Even if our focus in this paper is on the performance effect of fit between budget turbulence and tight budget control it is interesting to note that budget turbulence corresponds to what Sharma et al. (1981) classify as quasi-moderation and not pure moderation.[6] However, this still means that budget turbulence moderates the relationship. In the case of

[6] Budget turbulence is related to budget deviation but unrelated to tight budget control. In the pure moderation form budget turbulence would also be unrelated to budget deviation (Sharma et al., 1981; Luft and Shields, 2003).

quasi-moderation, it is important to use moderated regression analysis, as has been done in this article, not to draw conclusions based on spurious associations (Sharma et al., 1981). Since our theory does not aim at predicting certain values of a dependent variable that is ordered from low to high (performance), but to test for differences in relationships (effects/paths), we made no further effort to analyse the main effect of budget turbulence on budget deviation. Running the same model as model 2 in Table 2 but with budget deviation, budget turbulence and past budget deviation expressed in absolute values substantially produces the same result (see Table A3 in the appendix).

As a robustness check of the interaction model, we controlled for the potential disturbance of non-linearity of the main effects (budget turbulence*budget turbulence and tight budget control*tight budget control). The data did not support such variables. We also estimated the interaction effect using the repeated indicator approach to assess the robustness of our two-stage estimation (Henseler and Chin, 2010). The interaction term was positive and statistically significant using that method as well.

The conclusions from these results and analyses are that our hypothesis of a contingent effect of budget turbulence on the relationship between tight budget control and budget deviation is supported and that the implications of the contingent effect support our expectations. Tight budget control lessens budget deviation in both extremes (end points) of budget turbulence. We discuss the implications of these results further in the final section.

5. Concluding discussion

One argument for this study was the general lack of studies on the relationship between budget control and budget deviations in public sector organizations. Therefore, an important finding of our study is its support of our hypothesis about tight budget control in public sector organizations. The effect of tight budget control on budget deviations is contingent upon the level of budget turbulence. More precisely, in situations when budgets for some reason expand or contract substantially, and when small budget deviations are a priority, tight budget control is an effective device. By studying and finding evidence for positive and intended effects of tight budget control, this study adds to the budget literature, which is biased towards focusing on the dysfunctional effects of tight budget controls (Hartmann, 2000; Marginson and Ogden, 2005). This knowledge is important since the public sector is still an area in which budgets and budget controls are paramount in many areas and where economic turbulence from time to time makes public sector organizations face control challenges. The ability to control budget deviations is crucial for public sector organizations and our results clearly speak to the managerial relevance of implementing tight budget control for cost control purposes when facing budget turbulence. The results, however, equally suggest that tightening the budget control system in situations of low budget turbulence does not lead to better cost control and thus challenge the idea that tight budget control is universally effective when precision in budget compliance is important.

Another reason for conducting this research was the sole focus on the selection type of contingency fit in previous research on budget control in turbulent environments. In extension to Khandwalla (1972), Ezzamel (1990), and Gosh and Willinger (2012), who only report correlations between turbulence variables and budget control variables, we include budget performance and show that the fit between the environment and tight budget control in terms of an interaction type of fit (Venkatraman, 1989; Gerdin and Greve, 2004) affects budget performance. Theorizing about and testing the relationship between environment turbulence and budget design fit on budgetary performance makes it possible to evaluate the validity of contingency hypotheses also in contexts where it does not seem plausible to assume that only fit organizations exist to be observed. The public sector setting is argued to be one such apparent context, but there are probably similar contexts also within the realm of the private sector. Markets are seldom perfect and agents are often bounded rational (Donaldson, 2001). Importantly, our study shows that the choice between two major structural forms of conceptualizing and testing contingency hypotheses (Chenhall, 2003; Gerdin and Greve, 2004) is not just a matter of taste and semantics. If we had chosen the selection form, the hypothesis would have been rejected since budget turbulence and tight budget control are uncorrelated. This shows that it is important for researchers to have a clear understanding of the context in which they test contingency hypotheses so as not to draw false conclusions about the underlying theory of fit (cf. Johansson, 2013). Altogether, by showing the importance of fit for budgetary performance we further corroborate the hypothesis in the accounting literature that the use of formal controls and 'traditional' budget control is appropriate in turbulent environments (Chenhall, 2003, 138). Since research on budget related outcomes in the public sector is scarce, our study also extends the generalization of this hypothesis to be valid not only for private sector organizations, but also for public sector organizations.

Moreover, compared to previous studies our research design and method entail several incremental improvements. By using archival data for measuring budget deviation, we mitigate the common method bias problem of using self-rated measures for both predictor and outcome variables. In addition, we use objective data on environmental turbulence, which better fits with the structural contingency theory that most studies on the environment and management control system link are based on. In other words, this study supports and extends previous observations about the design, use, and effectiveness of tight budget controls.

One limitation with this paper relates to generalizability. First, the public sector setting, with its special budget logic, is different from the private sector setting. However, this difference should not be exaggerated. Our setting consists of large organizations that rely strongly on budgets for planning and control (cf. Williams et al., 1990). Second, our theorizing and empirical results are based on a study in a cost centre context rather than a profit centre context (Van der Stede, 2001). This context, however, also represents a contribution to the budget literature that is heavily

biased towards profit oriented control situations in private business (Hartmann, 2000). It ought to be relevant also to study the effect of budget controls in a context where the budget control problem is one of predictability and control rather than one of spurring motivation to maximize profit or sales. Therefore, this research contributes to the general literature on control tightness in which the need for and the effects of tight controls are debated (e.g., Chow et al., 1996; Hopwood, 1972; Merchant, 1985; Simons, 1995; Van der Stede, 2000). More precisely, it adds to the knowledge about the circumstances (interactions) in which tight controls may and may not be warranted.

Even though we used the hierarchical construct of tight budget control systems that includes several sub-elements, we recognize that a limitation of our research is that tight budget control may be only one part, although important, of the wider management control system (cf. Chenhall, 2003; Otley, 1980) directed at cost control. Also, although budget turbulence captures a large and important part of the environmental turbulence public sector organizations face, it is not complete. Turbulence may have other sources in this setting as well (Boyne and Meier, 2009). Furthermore, we have not analysed the effect of tight budget control on other budget performance criteria (operational targets, quality, etc.) or its effects on behavioural dysfunctions such as data manipulation and slack. The positive effect of tight controls for cost control purposes may re-emerge as a dysfunctional effect elsewhere (cf. Van der Stede, 2000). Finally, since this is a cross-sectional study, there is uncertainty as far as causation is concerned. Nevertheless, our findings, in which we control for past budget deviation, are in accordance with theoretical expectations.

Appendix A.

Tables A1–A3.

Table A1
The total (20) and empirically retained* (13) items used in the four first-order constructs of tight budget control (TBC).

Panel A: Emphasis on meeting the budget (Emphasis. 4 items used*)
1. Failure to meet its budget target has a strong influence on how a department's performance is assessed by the centre.*
2. According to the centre, departments perform poorly if they fail to meet their budget targets.*
3. The department leaders' future prospects in the municipality depend largely on their ability to meet budget targets.*
4. The centre primarily controls departments by monitoring how they perform compared to their budget targets.*
5. The centre primarily assesses department performance on the basis of compliance with budget targets.
6. According to the centre, the departments' ability to meet their budget targets is an adequate way of determining whether they have been successful in their operations.
7. Departments are constantly reminded by the centre about the need to meet their budget targets.

Panel B: Budgeting detail (Detail. 3 items used*)
1. The centre is interested not only in how well departments manage the bottom line of budgets but also in how well departments manage separate budget items.*
2. Departments are required to submit reports to the centre in which they explain budget deviations in detail, item by item.*
3. Departments are well aware that their budget target compliance is controlled in detail.*

Panel C: Budgeting interim deviations (Deviate. 2 items used*)
1. Departments are required to report the actions they will take to restore interim budget deviations.*
2. Departments are required to report in writing the causes of interim budget deviations.*
3. The centre is little concerned with interim budget deviations.
4. The centre attaches much importance to interim budget deviations.

Panel D: Intensity of budget-related communication (Intensity. 4 items used*)
1. Departments consult the centre about how to proceed in order to meet their budget targets.*
2. Departments often communicate informally with the centre on budget-related issues.*
3. Departments and the centre regularly discuss budget issues even when there are no budget deviations.*
4. The centre calls departments to meetings to discuss budget deviations.*
5. Budget-related problems are often solved by group discussions in which the centre, department managers and operation managers participate.
6. Departments often communicate formally with the centre on budget-related issues.

Table A2
Correlations between constructs.

	Emphasis	Detail	Deviate	Intensity	Budget deviation	Budget turbulence
Detail	0.4073	1				
Deviate	0.3342	0.4760	1			
Intensity	0.3296	0.3125	0.3149	1		
Budget deviation	0.0534	−0.0855	0.0249	−0.0172	1	
Budget turbulence	−0.005	0.112	0.0043	−0.0225	−0.5597	1
Past budget deviation	−0.0045	−0.0499	−0.0069	−0.011	0.4151	−0.5794

Note: Lowest square root of AVE is 0.725.
Emphasis = Politicians and central management put much emphasis on meeting the budget.
Detail = Politicians and central management have a detailed interest in specific budget line items.
Deviate = Politicians and central management do not lightly tolerate deviations from interim budget targets.
Intensity = Politicians and central management are intensively engaged in budget-related communications. All other variables are defined in Section 3.

Table A3
PLS structural regression model using absolute values.

Interaction model with *latent scores*. Budget deviation, budget turbulence and past budget deviation in *absolute values*.

From	To
	Budget deviation (abs)
TBC	−0.064
Budget turbulence (abs)	0.305***
Budget turbulence (abs) × TBC	−0.174**
Past budget deviation (abs)	0.068
R^2	0.134

Significance levels for 5000 bootstrap samples. Standardized regression weights displayed.
*< 0.05 sig., ** < 0.01 sig., *** < 0.001 sig., $N = 196$, TBC = tight budget control.

References

Anessi-Pessina, E., Barbera, C., Rota, S., Sicilia, M., Steccolini, I., 2012. Public sector budgeting in European accounting and public management journals: a review. In: Presented at 7th International Conference on Accounting, Auditing & Management in Public Sector Reforms, Rome.

Bagozzi, R.P., Edwards, J.R., 1998. A general approach for representing constructs in organizational research. Org. Res. Methods 1, 45–87.

Boland, R.J., Pondy, L.R., 1986. The micro dynamics of a budget-cutting process: modes, models and structure. Acc. Org. Soc. 11, 403–422.

Bourmistrov, A., Kaarboe, K., 2013. From comfort to stretch zones: a field study of two multinational companies applying beyond budgeting ideas. Manage. Acc. Res. 24, 196–211.

Boyed, B.K., Dess, G.G., Rasheed, A.M.A., 1993. Divergence between archival and perceptual measures of the environment: causes and consequences. Acad. Manage. Rev. 18, 204–226.

Boyne, G., Meier, K.J., 2009. Environmental turbulence, organizational stability, and public service performance. Admin. Soc. 40, 799–824.

Boyne, G., Ashworth, R., Powell, M., 2000. Testing the limits of incrementalism: an empirical analysis of expenditure decisions by English local authorities, 1981–1996. Public Admin. 78, 51–73.

Chapman, C.S., 1997. Reflections on a contingent view of accounting. Acc. Org. Soc. 22, 189–205.

Chenhall, R.H., 2003. Management control systems design within its organizational context: findings from contingency-based research and directions for the future. Acc. Org. Soc. 28, 127–168.

Chow, C.W., Kato, Y., Merchant, K.A., 1996. The use of organizational controls and their effects on data manipulation and management myopia: a Japan vs. U.S. comparison. Acc. Org. Soc. 21, 175–192.

Cohen, J., Cohen, P., West, S.G., Aiken, L.S., 2003. Applied Multiple Regression Correlation Analysis for the Behavioral Sciences, 3rd ed. Erlbaum, Hillsdale, NJ.

Covaleski, M.A., Dirshmit, M.W., 1988. The use of budget symbols in the budget arena: an historical informed field study. Acc. Org. Soc. 13, 1–24.

Donaldson, L., 2001. The Contingency Theory of Organizations. Sage Publications, Thousands Oaks, CA.

Downey, K.H., Slocum, J.W., 1975. Uncertainty: measures, research, and sources of variation. Acad. Manage. J. 18, 562–578.

Downs, A., 1957. An Economic Theory of Democracy. Harper & Row, New York.

Drazin, R., Van de Ven, A.H., 1985. Alternative forms of fit in contingency theory. Adm. Sci. Q. 30, 514–539.

Dunk, A.S., 1993. The effect of budget emphasis and information asymmetry on the relation between budget participation and slack. Acc. Rev. 68, 400–410.

Ezzamel, M., 1990. The impact of environmental uncertainty, managerial autonomy and size on budget characteristics. Manage. Acc. Res. 1, 181–197.

Fornell, C., Larcker, D., 1981. Evaluating structural equation models with unobservable variables and measurement error. J. Marketing Res. 18, 39–50.

Gerdin, J., Greve, J., 2004. Forms of fit in management accounting research: a critical review. Acc. Org. Soc. 29, 303–326.

Gosh, D., Willinger, G.L., 2012. Management control systems, environmental uncertainty and organizational slack: empirical evidence. Adv. Manage. Acc. 21, 87–117.

Hair, J.F., Black, W.C., Babin, B.J., Anderson, R.E., Tatham, R.L., 2010. Multivariate Data Analysis, 7th ed. Pearson Prentice Hall, Upper Saddle River, NJ.

Hall, M., Smith, D., 2009. Mentoring and turnover intentions in public accounting firms: a research note. Acc. Org. Soc. 34, 695–704.

Hartmann, F.G.H., 2000. The appropriateness of RAPM: toward the further development of theory. Acc. Org. Soc. 25, 451–482.

Hartmann, F.G.H., Moers, F., 1999. Testing contingency hypotheses in budget research: an evaluation of the use of moderated regression analysis. Acc. Org. Soc. 24, 291–315.

Hartmann, F., Slapnicar, S., 2009. How formal evaluation affects trust between superior and subordinate managers. Acc. Org. Soc. 34, 737–772.

Hayes, F.H., Metthes, J., 2009. Computational procedures for probing interactions in OLS and logistic regression: SPSS and SAS implementations. Behav. Res. Methods 41, 924–936.

Henseler, J., Chin, W.W., 2010. A comparison of approaches for the analysis of interaction effects between latent variables using partial least squares path modeling. Struct. Equat. Model. 17, 82–109.

Hirst, M.K., Lowy, S.M., 1990. The linear additive and interactive effects of budget goal difficulty and feedback on performance. Acc. Org. Soc. 15, 425–436.

Hope, J., Fraser, R., 2003. Beyond Budgeting: How Managers can Break Free from the Annual Performance Trap. Harvard Business School Press, Boston.

Hopwood, A.G., 1972. An empirical study of the role of accounting data in performance evaluation. Empirical Res. Acc. 12, 156–182 (Supplement to J. Acc. Res.).

Hou, Y., Smith, D., 2010. Informal norms as a bridge between formal rules and outcomes of government financial operations: evidence from state balanced budget requirements. J. Public Admin. Res. Theory 20, 655–678.

Jarvis, C.B., Mackenzie, S.B., Podsakoff, F.M., 2003. A critical review of construct indicators and measurement model misspecification in marketing and consumer research. J. Consum. Res. 30, 199–218.

Jaworski, B.J., Stathakopoulos, V., Krishnan, H.S., 1993. Control combinations in marketing: conceptual framework and empirical evidence. J. Marketing 57, 57–69.

Johansson, T., 2013. A critical appraisal of the current use of transaction cost explanations for government make-or-buy decisions: towards a contingent theory and forms of tests. Public Manage. Rev., http://dx.doi.org/10.1080/14719037.2013.848922 (in press).

Jönsson, S., 1982. Budget behaviour in local government–a case study over 3 years. Acc. Org. Soc. 7, 287–304.

Khandwalla, P., 1972. The effects of different types of competition on the use of management controls. J. Acc. Res. 10, 275–285.

Khandwalla, P., 1977. Design of Organizations. Harcourt Brace Jovanovich, New York.

Klein, R.B., 2011. Principles and Practice of Structural Equation Modeling, 3rd ed. The Guilford Press, New York.

Kwok, W.C.C., Sharp, D.J., 1998. A review of construct measurement issues in behavioral accounting research. J. Acc. Lit. 17, 137–174.

Lohmöller, J.B., 1989. Latent Variables Path Modeling with Partial Least Squares. Physica-Verlag, Heidelberg, Germany.

Luft, J., Shields, M.D., 2003. Mapping management accounting: graphics and guidelines for theory-consistent empirical research. Acc. Org. Soc. 28, 169–249.

Macintosh, N., Quattrone, P., 2010. Management Accounting and Control Systems. An Organizational and Sociological Approach. John Wiley and Sons, Ltd., Chichester, UK.

Marginson, D., Ogden, S., 2005. Coping with ambiguity through the budget: the positive effects of budget targets on managers' budgeting behaviours. Acc. Org. Soc. 30, 435–456.

Merchant, K.A., 1985. Organizational controls and discretionary program decision making: a field study. Acc. Org. Soc. 10, 67–85.

Merchant, K.A., Van der Stede, W.A., 2012. Management Control Systems: Performance Measurement, Evaluation, and Incentives. Pearson Education, Harlow, UK.

Nelson, R.R., Winter, S.G., 1982. An Evolutionary Theory of Economic Change. The Belknap Press of Harvard University Press, Cambridge, MA.

Nylinder, P., 2009. Tight budget control: a study of clinical department managers' perceptions in Swedish hospitals. J. Health Serv. Res. Pol. 14, 70–76.

Otley, D.T., 1978. Budget use and managerial performance. J. Acc. Res. 16, 122–149.

Otley, D.T., 1980. The contingency theory of management accounting: achievement and prognosis. Acc. Org. Soc. 5, 413–428.

Podsakoff, P.M., MacKenzie, S.B., Lee, J.-Y., Podsakoff, N.P., 2003. Common method biases in behavioural research: a critical review of the literature and recommended remedies. J. Appl. Psychol. 88, 879–903.

Reinartz, W., Haenlein, M., Henseler, J., 2009. An empirical comparison of the efficacy of covariance-based and variance-based SEM. Int. J. Res. Marketing 26, 332–344.
Ringle, C.M., Wende, S., Will, S., 2005. SmartPLS 2.0 (M3) Beta, Hamburg 2005.
Sharma, S., Durand, R.M., Gur-Arie, O., 1981. Identification and analysis of moderator variables. J. Marketing Res. 18, 291–300.
Simons, R., 1987. Accounting control systems and business strategy: an empirical analysis. Acc. Org. Soc. 12, 357–374.
Simons, R., 1995. Levers of Control: How Managers use Innovative Control Systems to Drive Strategic Renewal. Harvard Business School Press, Boston.
Statistics Sweden, 2011. The Public Finance Data Base. Income Statements for Municipalities 1998–2010.
Tenenhaus, M., Vinzi, V.E., Chatelin, Y., Lauro, C., 2005. PLS path modeling. Comput. Statistics and Data Analysis 48, 159–205.
The Municipal Act, 1991. SFS 1991:900. Sweden.
Van der Stede, W.A., 2000. The relationship between two consequences of budget controls: budget slack creation and managerial short-term orientation. Acc. Org. Soc. 25, 609–622.
Van der Stede, W.A., 2001. Measuring 'tight budget control'. Manage. Acc. Res. 12, 119–137.
Van Rinsum, M., Verbeeten, F.H.M., 2012. The impact of subjectivity in performance evaluation practices on public sector managers' motivation. Acc. Bus. Res. 42, 377–396.
Venkatraman, N., 1989. The concept of fit in strategy research: toward verbal and statistical correspondence. Acad. Manage. Rev. 14, 423–444.
Wallander, J., 1999. Budgeting – an unnecessary evil. Scand. J. Manage. 15, 405–421.
Wetzels, M., Odekerken-Schröder, G., van Oppen, C., 2009. Using PLS path modeling for assessing hierarchical construct models: guidelines and empirical illustration. MIS Quart. 33, 177–191.
Wildavsky, A., 1975. Budgeting: A Comparative Theory of Budget Processes. Little, Brown and Co., Boston.
Wildavsky, A., 2001. Budgeting and Governing. Transaction Publishers, New Jersey.
Williams, J.J., Macintosh, N.B., Moore, J.C., 1990. Budget-related behavior in public sector organizations: some empirical evidence. Acc. Org. Soc. 15, 221–246.
Wold, H., 1982. Soft modeling: the basic design and some extensions. In: Jöreskog, K.G., Wold, H. (Eds.), Systems Under Indirect Observation: Causality, Structure, Prediction, vol. 2. North-Holland, Amsterdam, pp. 1–54.