

# Usefulness of the budget: the mediating effect of participative budgeting and budget-based evaluation and rewarding

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## Citation

WAGNER, Jaroslav, Petr PETERA, Boris POPESKO, Petr NOVÁK, and Karel ŠAFR. Usefulness of the budget: the mediating effect of participative budgeting and budget-based evaluation and rewarding. *Baltic Journal of Management* [online]. vol. 16, iss. 4, Emerald Group Publishing, 2021, p. 602 - 620 [cit. 2023-04-17]. ISSN 1746-5265. Available at <https://www.emerald.com/insight/content/doi/10.1108/BJM-02-2020-0049/full/html>

## DOI

<https://doi.org/10.1108/BJM-02-2020-0049>

## Permanent link

<https://publikace.k.utb.cz/handle/10563/1010399>

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# Usefulness of the budget: the mediating effect of participative budgeting and budget-based evaluation and rewarding

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## **Abstract**

**Purpose** - This paper contributes to budgeting-related literature by investigating whether the participation of operational managers in budgeting, and budget-based evaluations and the rewarding of operational managers, significantly mediate the relationship between budget use for operational management and the perceived usefulness of the budget.

**Design/methodology/approach** - The paper is based on data gathered from a survey of Czech medium- and large-sized companies from the manufacturing sector. The hypothesised relationships are tested using partial least squares structural equation modelling (PLS-SEM).

**Findings** - Overall usefulness of the budget, as perceived by principals (top managers), is positively influenced by the scope of budget use, but, more importantly, the positive mediating effects of participative budgeting and budget-based evaluation and rewarding on this relationship are significant and strong.

**Research limitations/implications** - The subjective perceptions of respondents were investigated with the understanding that they may not represent actual situations in their organisations. Companies with wellfunctioning budgeting systems were more likely to take part in the research. Regarding satisfaction, the authors studied the perceived usefulness of the budget. Only medium- and large-sized manufacturing companies located in a post-communist country were analysed and generalisations should, therefore, be taken with caution.

**Practical implications** - The results in the studied sample indicate that satisfaction with budgeting is positively correlated with the rewarding and evaluation of operational managers, and with enabling the participation of operational managers in preparing and updating their budgets.

**Originality/value** - This research contributes to prior literature on budgeting by investigating the mediating effects of the participation of operational managers in budgeting, and the budget-based evaluation and rewarding of operational managers on the perceived usefulness of the budget by principals in an integrated model using the PLS-SEM approach.

**Keywords:** Budgeting, participative budgeting, operational management, performance evaluation and rewarding, agency theory, mediating effect

## 1. Introduction

**Bruns and Waterhouse (1975)** state that “Budgets are financial plans and provide a basis for directing and evaluating the performance of individuals or segments of organizations” (p. 180). **Otley (1999)** proposed that “Budgeting has traditionally been a central plank of most organizations’ control mechanisms” (p. 370). Despite the fact that researchers (e.g., **Hope and Fraser, 2003a; Rickards, 2008**) have provided a comprehensive examination of the weaknesses of budgeting, budgeting itself is a standard feature of modern business and frequently investigated in academia (**Hartmann, 2000; Libby, 1999; Libby and Lindsay, 2010; Sandalgaard, 2012**), as reflected by the ample amount of literature available. **Kenno et al (2018)**, for example, recently provided a literature review on almost 250 articles on budgeting indicating that research in this area remains popular and relevant.

Budgeting can be considered as a part of an internal control mechanism (**Davila et al., 2018**) and the involvement, or disinvolvement, of operating managers in the budgeting process is a key assumption when considering whether a budgeting process is functional or dysfunctional (**Libby and Lindsay, 2010**). From the perspective of agency theory (**Covaleski et al., 2006; Eisenhardt, 1989; Hill and Jones, 1992; Jensen and Meckling, 1976**), principals (top managers in this paper) can motivate agents - subordinates (operating managers) - to dedicate time to tasks that benefit the principal, and to communicate to the principal what the agent knows about local conditions (**Covaleski et al., 2006**) when budgeting systems are designed appropriately.

Furthermore, a comprehensive budgeting system is a tool which sets goals across the organisational environment. According to goal-setting theory (**Locke, 1996, 2004**), it is necessary to set high-quality goals before implementing rewards for performance. The implementation of budgets in operational management allows principals to introduce performance evaluation and rewarding based on objectives set by budgets.

Although there are numerous studies dealing with the appropriate involvement of subordinates in budgeting systems, as well as with performance evaluation and performance-based rewarding, the literature review revealed that previous research rarely tackles the question of whether principals assess these budgeting solutions as a useful part of the internal control mechanism. What is especially striking is the paucity of research addressing the indirect influence of budgeting use in operational management on the satisfaction of principals with budgeting through the participation of agents in the budgeting process, and through the evaluation and rewarding of agents based on the fulfilment goals set by budgets. Instead, previous studies focused either on the impact of budgeting solutions on organizational performance (e.g., **King et al., 2010**), which can be obfuscated by too many other variables, or on the influence of a manager’s motivation and job satisfaction (e.g., **Chenhall and Brownell, 1988; Kahar et al., 2016; Lau and Chong, 2002; Lau and Tan, 2003**), which does not align the principal and agent perspectives.

We believe that the satisfaction of principals with budgeting is a relevant measure when assessing the usefulness of budgeting for an organisation. Specifically, we consider that satisfaction can reflect organizational unit performance (which is usually recommended in economics-based studies), as well as job effort and motivation (which is common in psychology-based studies). This approach has its flaws and merits. Innovation is apparent when a principal’s satisfaction is the main independent variable as the principal’s viewpoint becomes the focal point. This is an important change of

perspective which compensates for the previous emphasis on the satisfaction (or motivation) of agents. Limitations to this approach are discussed in the Conclusions section.

Having identified this research gap, our paper aims to contribute to budgeting-related literature by investigating whether the participation of operational managers in budgeting and budget-based evaluation and rewarding of operational managers significantly mediate the relationship between the use of budgets in operational management and the perceived usefulness of the budget by the principals.

**Groen et al (2017)** suggest that doing research on budgeting systems in various countries, or specific industries, broadens the empirical foundation and understanding of the conditions of the implementation of budgets. At present, there are no studies aimed at these issues being realized in the transitioning, post-communist Czech Republic (**Wagner, 2018**).

This paper provides an analysis of the results of an original, empirical survey conducted among medium- and large-sized manufacturing companies in the Czech Republic in 2018/2019. To analyse the data, partial least squares structural equation modelling (PLS-SEM) was selected (**Hair et al., 2011, 2019; Reinartz et al., 2009**) as it is a relatively new approach not commonly used in management accounting research, as confirmed by **Nitzl (2016)** who argued that scholars in management accounting usually adopt methods they are accustomed to, such as regression analysis. PLS-SEM fits this study as PLS-SEM (in comparison with covariance-based SEM) is especially well-suited when there are minimal assumptions regarding data distribution and smaller sample size (**Lau et al., 2018**).

The paper is structured as follows. **Section 2** introduces the research model, including the hypotheses and the operationalisation of constructs. **Section 3** explains the methodology of this research, especially data gathering, and issues related with the utilisation of PLS-SEM. **Section 4** includes a presentation and discussion of results. **Section 5** provides key conclusions, limitations and ideas for further research.

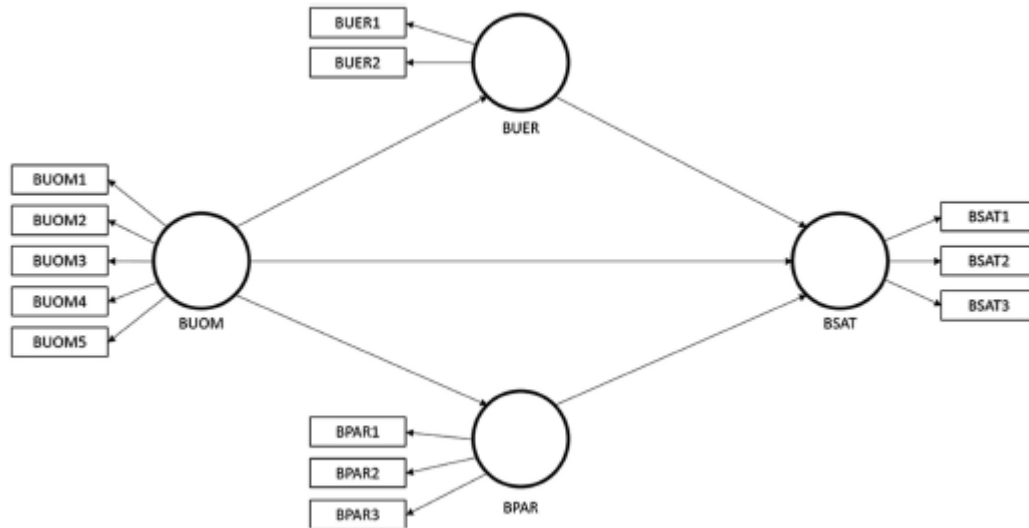
## **2. Research model and operationalisation of constructs**

This section introduces a model based on the literature review and provides an operationalisation of the constructs. **Appendix** furnishes specific questions used for the measurement (operationalisation) of the constructs.

### *2.1 Hypotheses development and research model*

The research model depicting the hypotheses (direct and indirect relationships between the investigated constructs) can be found in **Figure 1**.

The model examines two main groups of hypotheses. First, the direct relationship between the constructs, i.e., budget use in operational management (BUOM), participation of operating managers in the budgeting process (BPAR), budget-based evaluation and rewarding (BUER) and satisfaction of principals with budgeting (BSAT), for a total of five hypotheses. Second, the indirect relationship between BUOM and BSAT mediated by the BPAR and (BUER), i.e., two additional hypotheses which cannot be easily illustrated in **Figure 1**. The rationale behind this model follows.



**Figure 1.** Structural model of budgeting properties and satisfaction with budgeting

In the literature on performance management, it is often presumed that performance evaluation and rewarding is an extension of performance measurement. For example, **Speckbacher et al. (2003)** proposed a classification of the balanced scorecard (BSC). Type I BSC represents a specific multidimensional framework for strategic performance measurement that combines financial and non-financial strategic measures and is considered to be “minimum-standard BSC”. Type II BSC describes a strategy by using cause-and-effect relationships. Type III BSC connects incentives (i.e., rewards for performance) with BSC.

The literature from the field of psychology (e.g., goal-setting theory, **Locke, 2004**) notes that effective bonus plans are extremely difficult to set up and maintain. **Locke (2004)** advocates that “it is better to have no bonus system at all, other than simply merit pay, than to have a bad one” (p. 133). We theorise that the possibility of an inappropriate bonus system is especially high when there is no trustworthy performance measurement system (e.g., budgeting) and that the existence of a comprehensive budgeting system is a prerequisite for the implementation of performance-based rewarding.

The literature inspired us to presume that the utilisation of budgets for the evaluation and rewarding of operational managers is positively associated with the growing number of functions in which budgets are used. It is, therefore, possible to hypothesise that:

- H1. Budget use in operational management (BUOM) has a positive effect on budget-based evaluation and rewarding (BUER).

The degree to which agents are enabled to participate in the preparation of budgets is another important feature of a budgeting system. **Shields and Shields (1998)** claimed that few studies concerned the antecedents of participative budgeting and that further research was needed on this issue. **Shields and Shields (1998)** also found that sharing information and coordinating interdependence were the most important grounds for participative budgeting. **Lau and Tan (2003)** explored the relationship between budget emphasis and the degree of participative budgeting, assuming that the greater the emphasis on budget, the more principals empower agents to participate in budgeting in order to support fairness. **Lau and Tan (2003)**, on the basis of their literature review, also stressed that, according to psychology and management literature, budgetary participation was

conducive to favourable behavioural outcomes and helped to set more realistic budget targets which agents (subordinates) were willing to accept and internalise. Considering that BUOM represents an emphasis on budgeting, it is possible to hypothesise that:

- H2. Budget use in operational management (BUOM) has a positive effect on the participation of operating managers in the budgeting process (BPAR).

**Libby and Lindsay (2010)** proposed that accurately applied budgeting is beneficial for organizations and it can be suggested that the satisfaction of principals towards budgeting positively depends on multiple uses of the budgeting system.

However, certain budgeting functions may be in mutual conflict, which is in seeming contradiction to the proposed positive relationship between the multiple uses of budget and the satisfaction of principals as adding additional budget functions causes more conflict. It is beyond the scope of this paper to discuss the conflicting roles of budgeting in detail, but it is important to address the negative influence of the conflict of satisfaction with budgeting. According to current research (**Arnold and Artz, 2019; Arnold and Gillenkirch, 2015; Becker et al., 2016; Henri et al., 2020**), companies do deal with the problem of the conflicting roles of budgeting and benefit from the numerous reasons to budget.

Furthermore, the use of budgets at operational levels is presumed to be an important factor concerning the effectiveness of a budgeting process; therefore, it should increase the principal's satisfaction with budgeting. Without cascading budgets down to operational levels or without using budgets as a tool for communication between organizational levels, budgets may exist as only formal documents with no real influence. However, when correctly applied, budgets may be used as an effective communication tool. For example, **Covaleski and Dirsmith (1983)** noted that budgets can be used as a negotiating instrument between midlevel managers and upper-level organizational members.

Hence, it is possible to hypothesise that:

- H3. Budget use in operational management (BUOM) has a positive effect on the satisfaction of principals with budgeting (BSAT).

The issue of linking management control systems (including budgeting, e.g., **Fisher et al., 2002**) with performance evaluation and rewarding is covered extensively in the literature.

Some authors (**Kerr, 1975; Deci et al., 1994**) propose that rewarding, especially when unsuitably implemented, may have negative effects on motivation and performance. However, in work settings, a majority of scholars (**Cerasoli et al., 2014; Deci et al., 2017**) consider rewards to be an important tool for increasing work motivation and the performance of employees. In conjunction with this way of thinking, it is possible to support the utilisation of budgets for performance evaluation and/or rewarding operational managers to further strengthen the motivational impacts of budgeting on these managers who, consequently, show higher organizational commitment and/or performance. For example, **Groen et al. (2017)** found that the use of performance metrics for the evaluation of employees increased their performance. Ultimately, these processes should increase the satisfaction of principals with budgeting, thereby making it possible to formulate the following hypothesis:

- H4. Budget-based evaluation and rewarding (BUER) has a positive effect on the satisfaction of principals with budgeting (BSAT).

The participation of operational managers in the preparation of their budgets is another factor considered to be important for effective budgeting with some studies (**Fernandez-Revuelta Perez and**

**Robson, 1999**) pointing to the possibility that participation may be implemented only formally and serve as a ritual of control and legitimation. In such cases, the positive effects of participation might be suppressed.

Nevertheless, within the for-profit sector, a majority of authors highlight the positive effects of well-implemented participation in budgeting. For example, **Sponem and Lambert (2016)** concluded that higher levels of participation, the involvement of managers, and the importance assigned to action plans diminish the discontent associated with budgeting.

A typical assumption regarding the participation of operational managers in budgeting is that participation increases their commitment to budgeted goals and to the organization in general. The notion of the positive influence of participation is intertwined with the view that budgeting systems are not fixed technologies, but systems composed of numerous actors undergoing constant change (**Preston et al., 1992**), and the inclusion of operational managers into the budgeting fabric increases their acceptance of budgets.

For example, **Subramaniam and Mia (2001)** found that increasing budgetary participation increased organizational commitment, especially for managers with a high-value orientation towards innovation. **Mia (1989)** found that employees find participation useful when they consider their job to be difficult. **Nouri and Parker (1998)** examined the relationship between budget participation and job performance and their results support the hypothesis that budget participation leads to increased budget adequacy which improves job performance, both directly and indirectly, through organizational commitment. **Derfuss (2016)**, provided, on the basis of meta-analysis, a nuanced discussion of the relationship between budgeting and various types of performance.

Based on agency theory, **Covaleski et al. (2006)** pointed out that when participating in budget preparations and updating, operational managers (agents) communicate private information about local conditions to the principal, thus decreasing informational asymmetry.

Due to these benefits of participative budgeting, it is possible to postulate that these processes also increase the satisfaction of principals with budgeting, hence:

- H5. The participation of operating managers in the budgeting process (BPAR) has a positive effect on the satisfaction of principals with budgeting (BSAT).

In addition to the above-mentioned direct relationships, there are numerous indirect relationships which may be more significant than the direct ones. We theorise that BPAR and BUER may be important mediators of the relationship between BUOM and BSAT, and that mediation can occur through multiple mechanisms. This view is supported by **Lau and Tan (2003)**, who investigated the indirect effect of budgetary emphasis on job satisfaction via budgetary participation and job-relevant information, and discovered considerable evidence that high budget emphasis and high budgetary participation were associated with positive behavioural consequences. **Fisher et al (2002)** found the positive indirect effect of budgetary emphasis on the effort of subordinates and task performance through evaluation and rewarding.

In the settings of this study, where the key independent variable is the satisfaction of principals with budgeting (BSAT), it is possible to theorise that the aforementioned positive consequences of budget emphasis, through budgetary participation and budget-based evaluation and rewarding, should be positively assessed by principals making it possible to hypothesise that there is a positive indirect effect of BUOM on BSAT through BPAR and BUER:

- H6. **(H1+H4)**. Budget-based evaluation and rewarding (BUER) has a positive mediating role between budget use in operational management (BUOM) and the satisfaction of principals with budgeting (BSAT).
- H7. **(H2+H5)**. The participation of operating managers in the budgeting process (BPAR) has a positive mediating role between budget use in operational management (BUOM) and the satisfaction of principals with budgeting (BSAT).

## *2.2 Operationalisation of constructs*

Specific variables (measurement items) of constructs, selected on the basis of a literature review, were appropriately modified and redefined to suit the purposes of this research. All constructs were measured on a Likert-type scale and reflectively (the variables reflect the constructs). The exact wording of the questions can be found in **Appendix**.

The first construct represents the degree of budget use in operational management (BUOM). The literature review shows that there are two main approaches to the operationalisation of budget use, the first of which was applied by **Uyar and Kuzey (2016)** and **King et al. (2010)** and concentrated on types of budgeted variables (e.g., revenues and expenses, cash flow), as well as on budget period (annual, semi-annual etc.). The second approach, which can be found in **Hansen and Van der Stede (2004)**, **Sponem and Lambert (2016)**, **Sivabalan et al. (2009)** and **Bhimani et al. (2018)**, is more oriented on why budgets are used and concerns the functions (roles) of the budget as performance evaluation, forecasting of financial needs etc.

The latter approach was adopted in our study because it is well suited to the purpose of addressing budgeting as a part of the internal control mechanism. Hence, the construct is related to those budgeting functions which are key to the area of operational management: (1) defining responsibilities, contractualising tasks, setting duties; (2) communicating between various levels of the reporting line; (3) the transformation of strategy into management control; (4) coordinating various activities, processes and departments; and (5) allocating resources.

The constructs measuring the degree of budget use for performance evaluation and rewarding operational managers (BUER), and the degree of participation of operational managers in budgeting (BPAR) are measured in accordance with the approach of **Sponem and Lambert (2016)** whereby attention is paid solely to the questions concerning operational managers. Namely, BUER is addressed by the performance and the rewarding of operational managers being primarily assessed on their ability to meet budget targets. BPAR consists of the following three questions. Do operational managers frequently and regularly deal with budget preparation? Do they play a significant role in drafting their budgets? Do they play a significant role in updating their budgets?

As the aim of this paper is to measure if the implementation of budgeting in operational management influences the perceived usefulness of budgeting as an internal control mechanism while considering the mediating role of budgetary participation of operational managers and budget-based evaluation and rewarding, we need to measure the influence of all three constructs on the satisfaction of the principals with budgeting. The objective measurement of such a type of construct is not inherently possible. As suggested by **Shastri and Stout (2008)**, this construct was measured subjectively by recognizing the perceived usefulness of the budget. This last construct is called the overall budget satisfaction of principals (BSAT) to emphasise its subjective nature.



There is no generally accepted definition of this construct and the specific operationalisation in our study, inspired by **Ekholm and Wallin (2000)**, **Hope and Fraser (2003b)**, **Sponem and Lambert (2016)**, and, notably, **Hansen and Van der Stede (2004)**, encompasses the satisfaction of principals with the status quo of budgeting in their company as: (1) a tool for the transformation of the strategy to management control; (2) a performance management tool at the corporate level; and (3) a performance management tool of activities, processes and organizational units.

The rationale behind using BSAT as a key independent variable is based on the observation that the principal's satisfaction can be interpreted as an evaluation of the usefulness of the budgeting system.

We are aware of the weaknesses of this approach. Asking managers to evaluate the quality of their own work when the principals themselves share the competency, as well as responsibility, for designing the budgeting system. That said, the word "share" is of great importance as the current state of budgeting and internal control systems is influenced by many stakeholders and principals. In transitioning and post-transitioning countries, such as the Czech Republic, management models and patterns tend to change quickly due to the changing economic environment. Nevertheless, continuity in management accounting tools is apparent (e.g., **Vámosi, 2000**). Additionally, as summarized by **Richard et al. (2009)** and **Santos and Brito (2012)**, the subjective measurement is widely used in management literature.

### **3. Methodology**

#### *3.1 Data gathering*

Data were collected from October 2018 to January 2019 via an on-line questionnaire survey. The questionnaire was pilot tested by three executives and two academics resulting in minor changes to reflect their comments and suggestions. To increase response rate, companies were first contacted by phone to obtain the email address of targeted senior executives (such as CFOs, Controllers or Financial Managers). The survey questionnaire was originally created in English as some measures operationalised in previous English-written studies were used. All questions and scales were translated into Czech, with some minor adjustments due to Czech stylistics and terminology. To ensure its validity, a back-translation method was applied.

The sample of companies comprised business organizations in the Czech Republic categorised as industrial companies (designated as group "C": Manufacturing, according to the NACE Rev. 2) with more than 50 employees and a turnover above 256 million CZK (i.e., 10 million EUR). The sample was sourced from the Albertina CZ Gold Edition database and included 1,326 companies. The selected companies had sufficient size and displayed an extensive number of activities where budgeting may play an important role in the context of management control systems.

It was not possible to contact 188 companies and another 287 companies refused to provide an email address. The on-line questionnaire was successfully e-mailed to 851 companies, and approximately 14 days after the email, a direct phone call was made. As 112 companies replied dismissively and 517 did not provide any feedback, 222 questionnaires were ultimately obtained representing a response rate of 16.74%. Both the absolute number of responses and response rate can be considered high in comparison with similar studies on budgeting.

### *3.2 Methodology of data analysis - partial least squares structural equation modelling (PLS-SEM)*

The procedure of estimating the proposed model is based on a PLS-SEM model as the conditions of this study are favourable for this method (e.g., path model includes formatively measured constructs, small population restricts the sample size, risk of distribution issues etc.).

SEM models are quite a new approach (from a statistical point of view) having been formulated into their current version in the 1960 and 1970s. Several aspects should be taken into consideration, including the software used for estimating, and the exact shape of the model and their settings. To implement the PLS-SEM model SmartPLS 3.2.8 software was chosen.

The PLS-SEM method is a non-parametric method based on partial least squares where the variance - maximising explained variability - is minimised (**Hair et al., 2014**). PLS-SEM is an explanatory technique, whereas covariance-based SEM (CB-SEM) is a confirmatory approach based on a maximum likelihood estimation of parameter items. When data is normally distributed, the maximum likelihood estimation provides unbiased estimates of parameters. A general property of any likelihood method is that it requires a large sample size, due to the fact maximum likelihood is based on asymptotic theory. Nonnormality can negatively affect the results and several studies proved that it is advantageous to use PLS-SEM over the CB-SEM approach, especially in the case of small sample sizes (e.g., **Jannoo, et al., 2014**).

According to **Hair et al. (2014)**, the PLS-SEM model should be used when (1) the goal is to predict and identify key constructs; (2) a pure formative measured model must be used; (3) the structural model is complex; (4) a small sample size or data are not normally distributed; and (5) when latent variable scores in another analysis are required. CB-SEM should be used when (1) the aim is to test the theory on the data; (2) error terms should have another specification; (3) in case of non-recursive specifications; and (4) when goodness-of fit criteria is needed.

In this study it is possible to advocate that the data are not normally distributed and the sample size is not sufficient for the CB-SEM method. The estimated model is in accordance with mainstream theoretical approaches - the primary goal is not a confirmation of theory, but an evaluation of the power of relationships. These facts necessitated the use of the PLS-SEM approach.

PLS-SEM is based on an inner and outer model with the inner model composed of several constructs in relationships, and the outer model consisting of latent (exogenous/endogenous) variables. Exogenous latent variables serve only as independent variables and endogenous latent variables serve only as dependent variables, or as both independent and dependent variables.

Following the estimation parameters of the PLS-SEM model, which indicate the size and sign of effects (the coefficient is normalised in the interval - 1 to +1), several statistics must be investigated, the first of which is construct reliability and validity. This can be measured by several criteria, in this case a standard Cronbach's alpha, a composite reliability, and AVE (average variance extracted). The discriminant (or "divergent") validity, which tests the unrelatedness of constructs with variables connected to another construct (measured, e.g., by correlation), which should not be related, must be tested. Using the recommended (e.g., **SmartPLS, 2019; Garson, 2016**) HTMT criterion (the "Heterotrait-Monotrait ratio of correlations"), collinearity is measured by the variance inflation factor (VIF). Then, the size of the inner and outer models must be evaluated by hypothesis testing where the null hypothesis is that the coefficient is zero, and the alternative is that the actual value of the coefficient is non-zero. This allows us to say which path(s) is/are important and how strong this relationship is (measured by normalised coefficients). There are several path coefficients, the first of which is the total path coefficient which is the sum of the direct and indirect coefficients. The direct

coefficients represent the size of the effect from one construct to another, and the indirect from one construct through all other constructs to another construct. The indirect coefficients can be split into specific indirect coefficients which evaluate each specific way from one construct (through specific constructs) to the affected “final” construct. Finally,  $R^2$  reveals the amount of explained variability.

#### 4. Results and discussion

The results are presented as follows. First, the basic descriptive statistics on the respondents are displayed (**Table 1**). Second, the estimation of parameters and the evaluation of key statistics are presented. Third, the relevant path coefficients are calculated, as well as the amount of explained variability. Finally, the results, limitations and ideas for further research are discussed.

The results in **Table 1** prove that respondents consist only of medium- and large-sized companies. The smallest number of employees among respondents is 51.40 and the lowest turnover is 84,054,000 CZK. Despite the fact that these values do not meet the specified initial selection criteria, it was decided to not exclude these companies as they were close to the threshold values. Among the respondents, there were no companies with fewer than 50 employees and only nine companies with a turnover below 250,000 thousand CZK; the remaining respondents fully met the initial selection criteria. It is possible to presume that the data on these companies in the Albertina database were not fully exact.

**Table 1.** Basic descriptive statistics of the respondents

Descriptive statistics	Full-time employees	Assets (thousands CZK)	Turnover (thousands CZK)
Mean	405.54	1,334,831.17	1,837,580.63
Median	254.50	625,303.50	812,267.50
Standard deviation	431.06	2,433,015.01	3,313,429.03
Skewness	2.73	5.50	6.26
Kurtosis	8.97	39.40	55.87
Minimum	51.40	95,350	84,054
Maximum	2,747.00	23,622,071	36,426,811
25th percentile	153.81	295,232.50	405,886.50
75th percentile	471.25	1,286,623.00	1,742,678.25

##### 4.1 Measurement model validation

Prior to testing the proposed structural model, the reliability and validity of the measurement model were verified and outer loadings were calculated to check whether the variables selected were suitable for measuring the constructs. The results can be found in **Table 2**. For an explanation of the constructs and variables, see **Appendix**.

Both Cronbach’s alpha and composite reliability should exceed 0.7 (**Hair et al., 2017**). From **Table 2** it is evident that all constructs in the proposed model meet these criteria.

The average variance extracted (AVE) was computed to determine discriminant validity. **Hair et al. (2017)** postulated that AVE should be greater than 0.5 and, as seen in **Table 2**, it is again apparent that this requirement was fulfilled for all constructs.

Outer loadings displayed in **Table 2** confirm that the variables used are appropriate for measuring the constructs. Further, all variables have a positive effect on the reflected constructs.

As noted earlier, discriminant validity tests if the variables, which should be related to one construct, do not relate to another construct. Discriminant validity is valid when the HTMT criterion is below 0.85 (**SmartPLS, 2019**).

Results in **Table 3** confirm that this criterion was fulfilled and the model is valid.

#### 4.2 Structural model evaluation and discussion

Results of the path analysis are depicted in **Figure 2** and show that all relationships between constructs are statistically significant and positive.

Collinearity statistics (VIF) reflect the collinearity in data behind the latent variables. Generally, if the VIF is higher than 5 (**Hair et al., 2017**), it can be assumed that collinearity is present in the data.

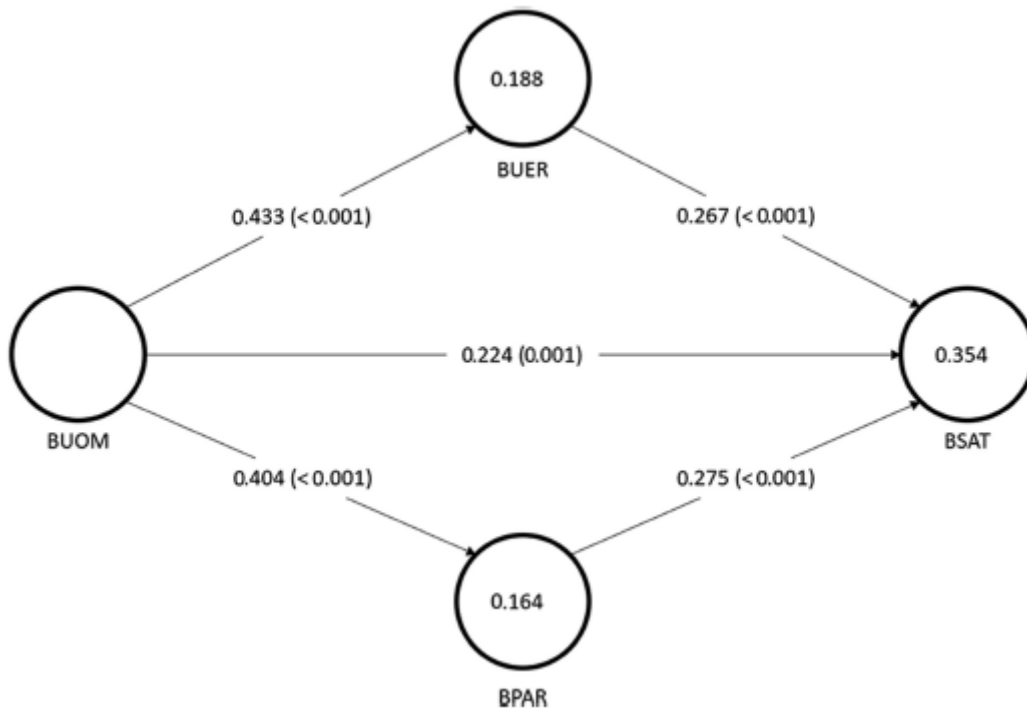
Based on the results displayed in **Table 4**, it is possible to conclude that VIF is not higher than 5 for any of the variables, therefore, there is no collinearity in the data. More importantly, it is necessary to check the structural model for collinearity issues (**Hair et al., 2017**), including assessments of BPAR, BUER, and BUOM as predictors of BSAT whose VIF values were 1.266, 1.304 and 1.346, respectively. The results confirmed that all VIF values are significantly below the threshold value of 5.

**Table 2.** BSAT Measurement model assessment

Construct	Variable (item)	Outer loadings	<i>p</i> value	Cronbach's $\alpha$	Composite reliability	Average variance extracted
BUOM	BUOM1	0.816	<0.001	0.865	0.902	0.648
	BUOM2	0.841	<0.001			
	BUOM3	0.819	<0.001			
	BUOM4	0.813	<0.001			
	BUOM5	0.733	<0.001			
BUER	BUER1	0.895	<0.001	0.750	0.889	0.800
	BUER2	0.893	<0.001			
BPAR	BPAR1	0.777	<0.001	0.710	0.834	0.626
	BPAR2	0.823	<0.001			
	BPAR3	0.772	<0.001			
BSAT	BSAT1	0.841	<0.001	0.848	0.908	0.767
	BSAT2	0.891	<0.001			
	BSAT3	0.894	<0.001			

**Table 3.** Discriminant validity (Heterotrait-Monotrait ratio, HTMT)

Construct	BPAR	BSAT	BUER
BSAT	0.570		
BUER	0.492	0.580	
BUOM	0.480	0.504	0.518



**Figure 2.** Path analysis results

**Table 4.** Collinearity statistics (VIF)

Variable (item)	VIF
BUOM1	2.167
BUOM2	3.064
BUOM3	1.955
BUOM4	2.350
BUOM5	1.473
BUER1	1.561
BUER2	1.561
BPAR1	1.179
BPAR2	1.935
BPAR3	1.805
BSAT1	1.828
BSAT2	2.439
BSAT3	2.167

In the next step, it is possible to evaluate the model's explanatory power through the  $R^2$  value which measures the variance explained in each of the constructs (the higher the  $R^2$ , the higher the explanatory power; values of  $R^2$  range from 0 to 1). For BSAT,  $R^2$  equals 35.4%, for BUER,  $R^2$  equals 18.8%, and for BPAR,  $R^2$  equals 16.4%. These values are acceptable in the field of social science."

**Table 5** show the results of hypotheses **H1** to **H7**. In the column "Coefficient", the path coefficients for **H1-H5** and specific indirect effects for **H6-H7**,  $p$ -values and evaluation of hypothesis are displayed.

The budget use for operational management positively and statistically significantly influences the utilisation of budgeting for the rewarding and evaluation of operational managers (**H1**), the participation of operational managers in budgeting (**H2**) and the satisfaction of principals with budgeting (**H3**). Hypotheses **H1-H3** are supported. A comparison of these results with previous studies must be interpreted cautiously as the key independent variable is the satisfaction of the principals with budgeting and the comparison is often based on the assumption that the positive effects of the budgeting system design, such as the performance of employees, is reflected in the satisfaction of the principals.

According to **H1**, the application of budgets for performance evaluation and the rewarding of operational managers is positively influenced by the extent to which the budget is used for operational management. Budgeting system is a tool which sets goals across the organisational environment and it is possible to claim that our results are in accordance with goal-setting theory (**Locke, 1996, 2004**), according to which it is necessary to set high-quality goals before implementing rewards for performance. According to **H2**, budget use for operational management has a positive effect on the participation of operational managers in budgeting. This corresponds with the findings of **Lau and Buckland (2001)** who confirmed the positive influence of high budget emphasis on the high participation of subordinates in their empirical study. According to **H3**, budget use for operational management has a positive effect on the satisfaction of principals with budgeting. It supports the results of **Hansen and Van der Stede (2004)** who demonstrated that overall budget satisfaction is significantly and positively correlated with budget implementation.

Moreover, the utilisation of budgeting for performance evaluation and rewarding operational managers directly positively and statistically significantly influences the satisfaction of principals with budgeting, i.e., hypothesis **H4** is supported. The possible interpretation of this result is that the growing satisfaction of principals with budgeting is influenced by increased satisfaction and, possibly, the performance of their subordinates, which in turn stems from the satisfaction of these subordinates with the process of their evaluation and rewarding (**Groen et al., 2017**).

In addition, hypothesis **H5**, regarding the positive influence of the participation of operational managers in budgeting on the satisfaction of principals with budgeting, is supported by the results. This finding confirms the predictions of agency theory (**Covaleski et al., 2006**) which claims that through participating in budget preparation and updating, operational managers (agents) communicate private information about local conditions to the principal and this lowers informational asymmetry. Similarly, mainstream psychology theories support the view that increasing budgetary participation increases the organizational commitment of employees, as well as their commitment to budgeted goals. This should be reflected in the satisfaction of principals with the usefulness of budgeting.

From **Table 5** it is evident that hypotheses **H6** and **H7**, concerning indirect relationships, are also supported by the results. Significantly, the total specific indirect effect of the influence of budget use for operational management on the satisfaction of principals with budgeting through mediators is equal to 0.227 and, therefore, higher than the direct effect which is equal to 0.224.

**Table 5** Evaluation of hypotheses

Hypothesis number	Hypothesis	Coefficient	Supposed mark	<i>p</i> value	Supported/ Rejected
H1	BUOM → BUER	0.433	+	<0.001	Supported
H2	BUOM → BPAR	0.404	+	<0.001	Supported
H3	BUOM → BSAT	0.224	+	0.001	Supported
H4	BUER → BSAT	0.267	+	<0.001	Supported
H5	BPAR → BSAT	0.275	+	<0.001	Supported
H6*	BUOM → BUER → BSAT	0.116	+	<0.001	Supported
H7*	BUOM → BPAR → BSAT	0.111	+	0.001	Supported

Note(s): \*Specific indirect effects are displayed here, not path coefficients

*Note(s): \*Specific indirect effects are displayed here, not path coefficients*

This indicates that the level of the principals' satisfaction with budgeting use in operational management is statistically significantly mediated by the utilisation of budgets for the rewarding and evaluation of operational managers, as well as with empowering operational managers to participate in the preparation of budgets. It is possible to interpret this result as a form of synergy between budget use for operational management with performance evaluation, rewarding, and participation. The result is in accordance with **Lau and Tan (2003)** who suggested that the impact of budget emphasis on job satisfaction was mediated by evaluation and rewarding.

Ultimately, the results of this study provide support to the stream of literature advocating the use of budgeting. For example, **Libby and Lindsay (2010)** concluded that "the problem with budgeting lies in how it is used rather than any inherent flaws" (p. 67), and **Ekholm and Wallin (2000)** emphasised that the most vitriolic critique of budgeting comes from consultants who have personal interests in persuading companies to change their management models. **Ekholm and Wallin (2000)** summarised that a vast majority of their respondents did not consider abandoning budgeting.

## 5. Conclusions

This study addressed the impact of the participation of operational managers in setting budgets and the impact of budget-based evaluations and the rewarding of operational managers on the relationship between budget use in operational management and the satisfaction of principals with budgeting. Our objective was to learn if these mediating effects were significant and how strong their influence was.

Our results show statistically significant positive indirect effects of budget use on budget satisfaction mediated by the participation of operational managers in the budgeting process, as well as by budget-based evaluation and rewarding. As this indirect effect is higher than the direct effect of budget use for operational management on the satisfaction of principals with budgeting, we can conclude that the benefits of budgeting are positively correlated with a participative budgeting system and with budget-based evaluation and rewarding. This supports the finding of **Kyj and Parker (2008)** whereby superiors promote subordinate participation when subordinates are evaluated using budget goals as it reflects a superior's concerns about the fairness or legitimacy of performance evaluation. It also corresponds with **Groen et al. (2017)** whose findings stated that the involvement of employees in the development of performance metrics results in superiors both perceiving the metrics to be of better quality and

employing those metrics more frequently when evaluating and rewarding employees. It is critical to mention that caution should be exercised, especially when generalising the results of this study with other industrial sectors and managerial levels.

In order to design the research model and deduce hypotheses, theories from various fields have been employed. For example, the hypothesis regarding the relationship between the participation of operational managers in budgeting and the satisfaction of principals with budgeting was especially informed by agency theory and goal-setting theory. The hypothesis regarding the relationship between performance evaluation and the rewarding of operational managers and the satisfaction of principals with budgeting was supported by self-determination theory and goal-setting theory in particular.

This study contributes both to theory and practice. Regarding theory, the results support the literature, according to which budgets are still relevant and beneficial to companies and that failures in budgeting implementation are caused by how budgets are applied in specific companies. Findings regarding participative budgeting are in accordance with agency theory which postulates that the participation of operational managers (agents) increases the knowledge of principals on local conditions in departments of a given company, decreases information asymmetry, and, thus, increases the satisfaction of principals with budgeting outputs (**Covaleski et al., 2006**).

The practical implications relate to the design and use of a budgeting system in companies which operate in the manufacturing sector. Our results in the studied sample indicate that satisfaction with budgeting is positively associated with the rewarding and evaluation of operational managers, and with the enabled participation of operational managers in preparing and updating their budgets.

As an additional contribution, the study suggests that budgets are an important part of internal control mechanisms and are frequently linked to performance evaluation and rewards in the context of medium- or large-sized manufacturing companies in the Czech Republic.

This study has several limitations. First, standard limitations stem from the inherent features of the chosen data-gathering instrument (the survey). Second, the subjective perceptions of respondents were investigated, and it is possible that they do not represent actual situations in their organizations. Third, non-response bias may have affected the results of this study because companies with better budgeting systems were more likely to have taken part in the research. Fourth, we did not directly address the impact of the involvement of operating managers on budgetary slack and misreporting as a demonstration of moral disengagement theory (**Church et al., 2012**). However, we presume that these potential effects are covered by the subjective assessment of the perceived usefulness of the budget. Fifth, there are limitations based on the characteristics of the sample - all companies involved in the survey were medium- or large-sized manufacturing companies. Practical implications relate only to the design and use of budgeting systems in companies of similar size operating in this industry. Last, but not least, we studied the perceived usefulness of the budget and the measurement of satisfaction in our study which resembles that of **Hansen and Van der Stede (2004)**.

Further research is needed in several areas. More large-scale surveys would be helpful because while prior research is ample, it suffers from methodological imperfections (especially in terms of sample size and the utilisation of elementary statistical models). In addition, case-study research providing rich information on budgetary practices within the broader context of management control systems would be of interest, such as how companies deal with the conflicting roles of budgets and how they ensure that the comprehensive use of budgeting has a positive impact.



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**Table A1.** Constructs, items and their scales

Constructs and items	Scale
BUOM 1: To what extent do you currently use a budget for defining responsibilities, contractualising tasks, setting duties?	1 = not used 2 = seldom used 3 = sometimes used 4 = often used 5 = systematically used
BUOM 2: To what extent do you currently use a budget for communicating between various levels of the reporting line?	1 = not used 2 = seldom used 3 = sometimes used 4 = often used 5 = systematically used
BUOM 3: To what extent do you currently use a budget for transformation of strategy into management control?	1 = not used 2 = seldom used 3 = sometimes used 4 = often used 5 = systematically used
BUOM 4: To what extent do you currently use a budget for coordinating various activities, processes and departments?	1 = not used 2 = seldom used 3 = sometimes used 4 = often used 5 = systematically used
BUOM 5: To what extent do you currently use a budget for allocating resources	1 = not used 2 = seldom used 3 = sometimes used 4 = often used 5 = systematically used
BUER1: To what extent do you agree with the following statement regarding assessment on the basis of meeting budget targets (without link to rewarding): "Performance of operational managers is primarily assessed on the basis of their ability to meet the budget targets"?	1 = strongly disagree 2 = disagree 3 = undecided 4 = agree 5 = strongly agree

(continued)

Constructs and items	Scale
BUER2: To what extent do you agree with the following statements regarding rewards on the basis of meeting budget targets: "Rewards of operational managers on the basis of meeting budget targets have a significant share on their total reward"?	1 = strongly disagree 2 = disagree 3 = undecided 4 = agree 5 = strongly agree
BPAR1: To what extent do you agree with the statement "Operational managers frequently and regularly deal with budget preparation"?	1 = strongly disagree 2 = disagree 3 = undecided 4 = agree 5 = strongly agree
BPAR2: To what extent do you agree with the following statement: "Operational managers play a significant role in drafting their budgets"	1 = strongly disagree 2 = disagree 3 = undecided 4 = agree 5 = strongly agree
BPAR3: To what extent do you agree with the following statement: "Operational managers play a significant role in updating their budgets"	1 = strongly disagree 2 = disagree 3 = undecided 4 = agree 5 = strongly agree
BSAT1: To what extent are you satisfied with the status quo of budgeting in your company as a tool for transformation of the strategy to management control?	1 = not satisfied 2 = rather not satisfied 3 = neither unsatisfied nor satisfied 4 = rather satisfied 5 = satisfied
BSAT2: To what extent are you satisfied with the status quo of budgeting in your company as a performance management tool at the corporate level?	1 = not satisfied 2 = rather not satisfied 3 = neither unsatisfied nor satisfied 4 = rather satisfied 5 = satisfied
BSAT3: To what extent are you satisfied with the status quo of budgeting in your company as a performance management tool of activities, processes and organizational units?	1 = not satisfied 2 = rather not satisfied 3 = neither unsatisfied nor satisfied 4 = rather satisfied 5 = satisfied