

The Maturity of a Budgeting System and its Influence on Corporate Performance

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Abstract: In recent decades, the features making up corporate budgeting systems have been profoundly deliberated over by academics and professionals. Indeed, so-called traditional methods of budgeting have borne the brunt of severe criticism due to their inflexibility and the sheer amount of time they demand of employees. Nonetheless, several examples exist of budgeting systems that have somehow been transformed, and of organizations which have adopted advanced, flexible budgeting procedures based on evaluation of performance. In the study presented, the authors look into any relationships that may exist between the primary elements of corporate budgeting systems and their performance in the enterprise. The aim is to contribute towards existing knowledge by: 1) summarizing the latest advances that relate to budgeting and corporate performance; 2) reporting on current budgeting practices applied by companies in the Czech Republic, with analysis of how budgeting systems affect managerial behaviour; 3) evaluating any statistical dependence between selected features of corporate budgeting systems; i.e. utilizing a budget as a managerial tool, how enterprises express the added value of budgeting systems, endeavour on the part of management in implementing an effective budgeting system, the workload pertaining to individual components of a budgeting system, and the significance of a budgeting system in comparison with other tools designed for adapting to change in market conditions. In general, the study describes interconnections between the profit-based performance of firms and the majority of the factors and features of the budgeting systems examined.

Keywords: Budgeting; Corporate Performance; Beyond Budgeting

1 Introduction

Budgeting, one of the essential tools of management accounting, is frequently used for control of organizations by management [16]. Malmi et al. [22] states that budgeting is one of the main tasks of a firm's accountants. Traditional budgets are usually based on annual periods and present the transformation of a plan into currency units [10].

Over the last three decades, it has been possible to observe increasing dissatisfaction with traditional budgeting systems: they began to be frequently

criticised in literature and by practitioners. Bunce *et al.* [7] presented a number of shortcomings of budgeting, including such claims as the following: that annual budgeting is soon outdated; is time-consuming, expensive and causes gaming; does not add value; and is based on a supply-oriented idea of production, which means that it lacks a customer orientation. These statements are supported by other authors: Libby and Lindsay [19] state that budgets are criticized for being time-consuming. Prendergast [27] claims that a lot of guesswork is required in the budgeting process, which takes up a lot of managerial time. Similarly, Neely *et al.* [25], state that the budgeting process actually consumes up to 20% of all managerial time. Nazli Nik Ahmad *et al.* [24] argue that budgets do not take into account the aspects of customers and quality, and thus prove ineffective in a changing environment.

In literature we can observe the broad discussion related to the elimination of the above-stated limitations of traditional budgets. Henttu-Aho and Järvinen [16] describe this discussion as the *Beyond Budgeting* debate. Scientific studies presented in recent decades reflect this normative criticism of the changing budgeting practice: they conclude that some shift exists from annual budgeting practices towards methods of simplified budgeting and rolling forecasts with a more forward-looking emphasis [19, 20, 26, 31]. However, only limited evidence exists of radical developments, or of companies that have applied Beyond Budgeting. A simple explanation of this is the fact that most transformations of budgeting practices or systems are both continuous and incremental, and they take place over relatively long periods of time [16]. In a study published in 2015, we have observed a very low number of firms which plan to abandon the traditional use of budgets for control but a modest number of firms which plan some changes in the budgeting process [28].

In general, budgeting practices are changing very slowly [11]. In a few field studies, traditional budgeting still seems to be in a relatively strong position, but some evidence exists of emerging developments such as rolling forecasts and the balanced scorecard [19, 34].

Hansen *et al.* [14] state that dissatisfaction with budgeting systems is leading to two different approaches: some firms wish remove budgeting altogether and others wish to improve it. Hope and Fraser [17] present several studies of European companies which abandoned traditional budgeting systems and replaced it with performance measurement systems based on performance indicators.

Classical management accounting textbooks [10] point at the conflicts in utilization of budgets; this is caused by utilizing the self-same budgeting system for different purposes such as motivation and planning. This conflict causes unfavourable manager behaviour which may in turn affect a decrease in company performance. Henttu-Aho and Järvinen [16] state that interaction between the multiple purposes and goals of budgeting could be regarded as the central theme in budgeting studies. Arnolda and Gillenkirch [2] presented a deep study focusing

on analysis of the conflict between different roles of the budget. The authors also state that conflict between different budgetary purposes has been analysed from an economic perspective, but little is known about their effects on corporate behaviour beyond monetary incentives.

A frequently criticised attribute of traditional short-term budgeting is its strict orientation on annual accounting periods [1]. One of the trends present in contemporary budgeting practices is the use of rolling budgets or rolling forecasts. These are produced by firms on a monthly or quarterly basis, and illustrate more dynamic and flexible processes in contrast to static traditional budgeting [16]. In rolling forecasts, the forecast is usually prepared for a specified future period (usually between 12 and 18 months) and adds a new month or quarter as the old month or quarter ends. The rolling forecast includes several benefits such as continuous planning throughout the year, less detailed content, easier updating, better focus on the future and timely reaction to planning [15].

In the literature, we also observe indications of gradual fragmentation of budgeting into various budget-related management accounting methods. These include fixed cost budgeting, activity-based budgeting, rolling budgets, rolling forecasts, the economic value added, target setting, balanced scorecard and benchmarking [16, 29, 34].

One of the most crucial features of modern budgeting practices is its linkage to company performance. Performance-based indicators are a key building block of the Beyond Budgeting approach [17]. The relation between budgeting systems and performance is usually explained through budgetary participation [33]. The relationship between budgetary participation and corporate performance has been investigated by many studies [3, 4, 5, 12, 21, 32]. Yang Qi [33] defines two major conceptual models in current management accounting literature which link budgetary participation with performance. The first are psychological theories [23] which state that participation (the upward information sharing) in the budgeting process – when given to subordinates – can stimulate motivation and commitment in budget-setting; this in turn positively affects job satisfaction and performance [6, 8, 18]. The second model explains the above-stated relationship from a cognitive point of view. It is explained that through budget participation (the downward information sharing), subordinates gain information from superiors that helps clarify their organizational roles, including their duties, responsibilities and expected performance; all of this leads to a performance increase [9, 18, 30].

In our study, we have focused on the relationship between the budgeting system maturity, which is measured by quality perception of managers and perceived company performance. We expected that firms with more advanced budgeting systems demonstrate higher performance when compared with their competitors. The maturity of the budgeting system has been measured by four factors based on the Libby and Lindsay [19] study, in which these factors were analysed as the important indicators of the budgeting system. We have analysed the following

factors: UB, the use of budgets for control where we have analysed on which level firms are using them in that capacity; PAV, the perception of the budgeting system's added value, where we have measured how firms perceive the overall value-added quality of the budgeting system; EMNA, an effort dedicated to the budget's preparation; and ERP, the effectiveness of the budgeting process in the field of adaptation to changes in the business environment.

This paper tries to contribute to the recent discussion in investigating the relationship between company performance and selected factors of the organizational budgeting process. Despite the several limitations of the study (the subjectiveness of the data collected from respondents and statistical processing of that data), we hope it brings new findings related to budgeting and its use in Czech firms.

2 Methods

The main objective of this paper is to identify and quantify significant factors determining profit-based performance of enterprises in the Czech Republic. The secondary objective is to compare profit-based performances of enterprises among selected groups of enterprises. The statistical characteristics of enterprises are investigated both by the number of employees and by the volume of sales received over the two preceding years. Scientific hypotheses have been formulated to fulfil the main and secondary objective of this paper.

H1: Enterprise performance in terms of profit (EP) is determined by the following factors: a) use of budget (UB) as a tool for enterprise management, b) perception of added value of the budgeting system for an enterprise (PAV), c) effort on the part of managers and workload volume expended to compose a budget (EMNA), d) significance of the budgeting process compared with other tools to adapt to changing market conditions (BP).

H2A: None of the selected groups of enterprises – neither by the number of employees nor by the volume of sales – report any statistically significant differences in the overall structure of evaluation of enterprise performance with regard to their direct competitors.

H2B: Enterprises under and above 500 employees and enterprises with sales under and above 8 million EUR will report statistically significant differences in their enterprise's evaluation of performance (in terms of profit) with regard to their direct competitors.

The research was undertaken in 2015 by the authors, these being academics at the Faculty of Management and Economics of the Tomas Bata University in Zlin (UTB). Data was collected via a questionnaire accessible on-line. Initially, the

ALBERTINA database was utilized to discern which enterprises would make suitable subjects for investigation, as well as to access contact details for the responsible persons at the same. The authors narrowed their search to companies of medium and large size operating in the industrial sector, thereby excluding service and trade establishments. The authors expected that such enterprises would represent those wherein budgeting played a critical role. For inclusion in the sample, the individuals contacted had to be employed at a senior level of financial management, with corresponding job titles such as Financial Director, Chief Financial Officer, Economic Director or Head of the Controlling Department. Such criteria were important in order to ensure that the contacts would possess sufficient experience in activities related to budgeting and gauging performance.

Afterwards, the people detailed in the database were contacted by telephone and asked about their willingness to take part in the study. Those who agreed to be surveyed were sent an email containing a link to the questionnaire, the latter taking approximately 30 minutes to complete.

In all, the authors contacted 1,375 companies, out of which 618 agreed to participate in the survey. In the end, the authors received 177 fully complete questionnaires, i.e. a return rate of 12.9%.

We applied regressive analysis in order to fulfil the main objective. The significance of the linear regressive model was to provide explanation of the course of dependency (relation) between enterprise performance (dependent variable) and its determinants (independent variables – UB, PAV, EMNA, BP). We verified the assumption of linearity through a graphic analysis of data with the application of dot graphs (Scatter Plots), of which significance consists of finding non-linear patterns between a dependent variable and independent variable. We performed the assumption of normal distribution of data with comparison of graphic analysis with the application of a histogram with a normal distribution curve (curve of normal profitability plot for every independent variable) and with testing of descriptive characteristics of independent variables (z-test of skewness and acuteness). The critical value of inclusion of independent variables into the regressive model is 1.973 (173 degrees of freedom, significance level at 0.05). The assumption of constant scattering of random errors and thereby also residues (homoscedasticity) was tested through Bartlett's test. The assumption of homoscedasticity was satisfied if the p-value of the test was greater than 0.05. We used the comparison matrix to determine the intensity of dependency of a dependent variable on independent variables. Values of parameters of the linear regressive model with more independent variables can be affected negatively with multicollinearity. We accept these multicollinearities in the results of the regressive modelling if the value of Variance Inflation Factor is more than 5 [13].

We applied z-score to determine differences between individual permutations of a statistical attribute. In order to verify dependency between two statistical attributes, we used the Chi-square test of independence in the contingency table,

based on calculation of square contingency. The execution of the independence test is conditional on that none of the theoretical frequencies is less than 1 and that a maximum of 20% of theoretical frequencies are less than 5 [13]. We utilized Pearson's contingency coefficient to determine the value of dependence. We selected the significance level at 5% (0.05) for all performed tests. Graphic verifying of assumptions as well as testing were performed in the statistics software of data analysing IBM SPSS statistics.

The basic regressive model with linear function is defined with the following relation between the dependent variable (EP) and independent variables (UB, PAV, EMNA, BP):

$$EP = \beta_0 + \beta_{UB} \times UB + \beta_{PAV} \times PAV + \beta_{EMNA} \times EMNA + \beta_{BP} \times BP, \quad (1)$$

where UB – independent variable; β_0 – constant, β_{UB} ; β_{PAV} β_{EMNA} ; β_{BP} – parameters of independent variables (UB, PAV, EMNA, BP); UB, PAV, EMNA, BP – independent variables.

For purposes of evaluation of the regressive model proposed in this manner, it was necessary to unify scale of determinants evaluation into a uniform structure. After consulting with experts, we have assigned word equivalents to the initial numeric evaluation of determinants PAV (perceived value on the scale 0-100): 0-20 significantly lower, 20-40 slightly lower, 40-60 on the same level, 60-80 slightly greater and 80-100 significantly greater. Further, for the factor affecting EMNA (rating 1 – 5), we have the scale: 1 - significantly lower, 2 - slightly lower, 3 - on the same level, 4 - slightly greater and 5 - significantly greater.

Basic results of the descriptive statistics of enterprises by selected statistical attributes (Table 1):

Table1
Detailed statistics for respondents of the survey

	Frequencies	%
Number of employees		
100-500	145	81.9%
More than 500	32	18.1%
Sector		
Manufacturing	81	45.7%
Automotive	12	6.8%
Construction	16	9%
Engineering	15	8.5%
Agriculture	15	8.5%
Other	38	21.5%
Annual Revenue		
Less than 8 million EUR	82	46.3%
Greater than 8 million EUR	95	53.7%

3 Results and Discussion

The selective data file consisted of 177 filled-in questionnaires from enterprises. With regard to fulfilment of the paper's objective and the verification of hypotheses, we identified the most significant determinants affecting enterprise performance. Variables derived from results of descriptive statistics (dependent, independent) with expression of absolute and relative frequency of enterprises on the rating scale are given in Table 2.

Table 2
Evaluation of enterprise performance and their determinants in terms of absolute and relative frequencies

Dependent and independent variables	Rating scale				
	Significantly lower	Slightly lower	On the same level	Slightly greater	Significantly greater
EP	10	24	68	57	18
	5.6%	13.6%	38.4%	32.2%	10.2%
UB	6	29	70	49	23
	3.4%	16.4%	39.5%	27.7%	13.0%
PAV	4	1	25	63	84
	2.3%	0.6%	14.1%	35.6%	47.5%
EMNA	32	53	49	25	18
	18.1	29.9	27.7	14.1	10.2
BP	26	33	89	29	0
	14.7%	18.6%	50.3%	16.4%	0.0%

Results of relative and absolute frequencies show that more than 80% of respondents hold the opinion that performance of their enterprise (EP) is the same or greater compared with their direct competitors. Results also show that 47.5% of enterprises hold the opinion that their budgeting system has a significantly high added value (PAV) for their enterprise.

In order to verify assumptions of the regressive analysis, which are specified in greater detail in Methods, we used graphical data analysis. Linear courses between the enterprise performance (in terms of profit) and independent variables (UB, PAV, EMNA, BP) result from the graphic data visualization performed in the IBM SPSS statistics. The linearity assumption is satisfied. We can observe deviations in frequency of individual groups of enterprises from the normal distribution curve during visualization of the histogram of independent variable BP with the normal distribution curve. Subsequently we will proceed to calculations and testing of descriptive characteristics (skewness, kurtosis) from which we can decide whether data satisfy the condition of normal distribution. Results are illustrated in Table 3.

Table 3
Skewness, kurtosis and z-value of independent variables of company performance model

Independent variable	Skewness	Z – value (skewness)	Kurtosis	Z – value (kurtosis)	Bartlett’s test
UB	0.987	0.425	1.081	0.556	0.706
PAV	0.647	1.899	0.568	0.754	0.447
EMNA	1.983	2.687	1.716	1.188	0.059
BP	2.612	2.872	-1.633	-3.175	<0.010

Results confirmed that independent variables UB and PAV satisfied the assumption of rating frequency normal distribution (z- score skewness and z- score kurtosis ≤ 2.000) as well as assumption of homoscedasticity (Bartlett's test for UB and Istrie ≥ 1.899). Independent variables EMNA and BP do not comply conditions of normal data distribution (EMNA: skewness z-score = 2.687; BP: skewness and kurtosis z–score > 2.000). The independent variable BP does not comply the condition of homoscedasticity (Bartlett's test < 0.01). Thus, the efficiency of the “budgeting process at adapting to the changing market” (BP) cannot be considered as a significant factor which would affect company performance. We did not admit the independent variable EMNA as a significant determinant into the regressive model in the first step. However, error of the data normality assumption is shown as decreasing with sufficiently large file extent (177 enterprises) [13]. Results of t-value confirm the statistical significance of the EMNA (t-value = 3.174) determinant, because it is greater than the critical area of its refusal. Intensity of dependency between a dependent variable and significant independent variables is displayed in Table 4.

Table 4
Correlation matrix of variables in company performance model

	EP	UB	PAV	EMNA
EP	1			
UB	0.6722	1		
PAV	0.58334	0.6461	1	
EMNA	0.54125	0.4679	0.5674	1

Medium-strong to strong dependency results from the correlation matrix results with the application of the correlation coefficient [13]. We admit independent variables UB, PAV and EMNA as **statistically significant parameters** of the linear regressive models from z-test results (see Table 3) and further EMNA results of t-test and correlation matrix (see Table 4). We have performed testing of the significance of the regression model proposed in this manner with three independent variables and recorded them into the following Table 5.

Analysis of the regression model by means of graphic and analytical tools has confirmed conditions of linearity, homoscedasticity and independence of variances as well as a condition of normality.

Table 5
Characteristics of regression model of company performance

Least squares multiple regression					
R ²			0.52147		
Adjusted R ²			0.51317		
Multiple correlation coefficient			0.72212		
Residual standard deviation			0.1328		
Regression equation					
Independent variables	Coefficient	Std. Error	t- Stat	p-value	VIF
Constant	0.2156				
UB	0.4857	0.2074	2.3412	0.020	1.8241
PAV	0.2821	0.0844	3.3424	0.001	1.5157
EMNA	0.2981	0.1229	2.4255	0.016	2.8488
Analysis of variance					
F-ratio			18.014		
Significant level			< 0.001		

Variance Inflation Factor results have not proved multicollinearity in the regression model (VIF – test of independent variables is less than critical value 5: UB = 1.8241; PAV = 1.5157; DPP = 2.8488). Differences between the determination factor and adjusted coefficient of determination are minimal (R²-0.52147 and Adjusted R²-0.51317). P-value of F-ratio of the entire regression model is less than 0.001. Following the aforementioned conclusions (see Table 5), we proceed to the formulation of a regression equation with linear function; this acquires the form:

$$EP = 0.4857 x UB + 0.2821 x PAV + 0.2981 x EMNA, \quad (2)$$

where EP - enterprise performance (profit), UB - use of budget as a tool of enterprise management, PAV - perception of added value of the budgeting system for a company, EMNA - effort on the part of managers and quantity of their activities expended to compose a budget.

The proposed regression model is statistically significant with three factors on the level of significance 0.05. The variability of the selected independent variables (UB, PAV, EMNA) explains up to 52.14% variability of enterprise performance, which can be considered as satisfactory. The other 47.86% of enterprise performance variability is explained by determinants not included in our search. Results show that UB determinant has the greatest influence on EP, or specifically that enterprises use a budget as a tool for enterprise management. Perception of added value of the budgeting system for an enterprise has the smallest influence out of the statistically significant determinants. Efficiency of the budgeting process at adapting to the changing market (BP) does not have any statistically significant influence and does not determine enterprise performance in terms of profit. H1 hypothesis can be admitted, however with the exclusion of BP determinant.

We have investigated enterprise performance on a sample of 177 enterprises in terms of profit. The authors have identified four determinants which come not only from theoretical-professional knowledge but also from practical knowledge. These selected determinants were subjected to statistical evaluation. The achieved results can be seen as a tool to explain significance and importance of the selected determinants and their effect on enterprise performance.

Table 6 includes responses of respondents by selected groups who evaluated enterprise performance during the past two years, with respect to their direct competitors.

Table 6
Comparison of enterprise performance evaluation in relation to direct competitors

Profit	Number of employees		Volume of sales		Z - score
	<500	>500	< 8 million EUR	> 8 million EUR	Number of employees Volume of sales
Significantly greater than competitors: 10.2% enterprises	16	2	12	6	0.417
	11%	6%	14.3%	6.3%	0.054
Slightly greater than competitors: 32.2% enterprises	50	7	24	33	0.167
	34%	22%	29.3%	34.7%	0.435
On the same level: 38.4% enterprises	54	14	29	39	0.490
	37%	44%	35.4%	41.1%	0.435
Slightly lower than competitors: 12.6% enterprises	19	5	12	12	0.703
	13%	16%	14.6%	12.6%	0.696
Significantly lower than competitors: 5.3% enterprises	6	4	5	5	0.064
	4%	13%	6.1%	5.3%	0.810
Chi - square	7.200		4.000		
P - value	0.124		0.412		

Results (see table 6) show that up to 42.4% of respondents evaluate the performance level of their enterprise (by profit) better (significantly and slightly greater) than their direct competitor for the past two years. Structure of enterprise evaluation by number of employees or by volume of sales **is not statistically significant** (p-value is greater than 0.05). And thus we accept the H2A hypothesis. Z-score results show that differences in the number of employees up to 500 and above 500 and also with the volume of sales under 8 million EUR and above 8 million EUR do not represent statistically significant differences in the frequency of responses (p-value > 0.05). And thus we refuse the H2B hypothesis.

Discussion and conclusions

Despite criticism of the traditional budgeting systems which has appeared plentifully in recent literature, we can state that budgeting represents an irreplaceable tool in enterprises and plays a significant role also in terms of enterprise performance. This fact was confirmed by the survey performed. As the statistical linear regression model results show, we are able to identify determinants which are perceived in companies as significant with respect to increase in the enterprise performance.

We perceive in our case the following factors as determinants with **significant** influence in companies:

- use of budget (UB) as a tool for enterprise management,
- perception of added value of the budgeting system for an enterprise (PAV),
- effort on the part of managers and quantity of activities to compose a budget (EMNA).

On the contrary, the factor of significance of the “**budgeting process** compared to other tools for adapting to changing market conditions” (BP) appeared to be statistically insignificant this means that managers do not perceive for it any significant influence on enterprise performance in terms of profit. We can derive from it that managers perceive the significance of the budgeting process itself (with regard to influence on enterprise performance) on the same level as application of other relevant tools.

We can formulate a number of conclusions on the basis of the evaluation of these factors. The use of a budget as a tool of management has a statistical dependence on perceived enterprise performance in terms of profit. This conclusion is in partial conflict with opinion of some authors [19]. They perceive enterprises which stopped using a budget for management purposes as those using more developed systems for performance control. This conclusion can be also interpreted in the manner that there is a significant group of enterprises in our sample which do not use budgeting at all (or possibly only for simplified purposes, as for example for resource allocation).

Another factor for which statistical dependency appeared is the perception of added value of the budgeting system for an enterprise (PAV) to increase its performance. Results show that if a company perceives highly added value of its budgeting system, it is reflected into higher perceived value of enterprise performance. This dependency would confirm the assumption that more developed budgeting systems manifest themselves in higher perceived company performance.

Other factors which were investigated in relation to enterprise performance (EP) include “effort on the part of managers and number of activities expended to

compose a budget” (EMNA). Results have confirmed that the greater effort expended to compose a budget can be demonstrated in a higher perceived value of performance. This fact would indicate that higher effort expended to budgeting is an attribute of a greater advanced level and quality of budget, which is then demonstrated in greater perceived enterprise performance, which according to searches of the literature is not a generally accepted fact.

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