

# THE SUSTAINABILITY OF THE EXISTING COST MANAGEMENT SYSTEM WITH AN EMPHASIS ON THE PUBLIC SECTOR

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**Abstract:** *The aim of the paper is to compare the cost management approaches in the public and private sectors, with an emphasis on the public sector. The data was collected in 2017 and 2018 in the Czech Republic. The main results showed that most respondents do not use Activity Based Costing and that there are no statistically significant differences between the public and private sector. Both public and private sectors, if keeping records of management accounting, charge costs in such a way so as to be able to determine the total costs of their activities at any time. Not even the fact that an organization uses public funds increases the chance of the given organization to look for the information about its full costs. Most of the respondents in both groups make important financial decisions based on knowledge of full costs of their activities. The research thus has not proved that the public sector subjects would have a different approach to finding out about full costs than the private sector units.*

**Keywords:** *Activity Based Costing, Cost Allocation, Cost Management, Private Sector, Public Sector.*

**JEL Classification:** *M21, M40.*

## Introduction

The basic prerequisite for an effective financial management of all types of organisational units, i.e. both private and public, is undoubtedly knowledge of costs. Every subject which offers its services and products in return for payment must be able to correctly value its outputs, which, of course, is not possible without the knowledge of costs. It is not important whether the subject is operating in the public or private sector. However, it is necessary to emphasise that not every economic subject is able to apply modern cost management methods including the Activity Based Costing (ABC) and Time Driven Activity Based Costing (TD ABC).

These calculation methods are described especially in the literature related to management accounting (e. g. Abernethy et al., 2001; Al Omiri and Drury, 2007; Baird, 2007; Brierley et al., 2007, Garrison et al., 2014, Henttu-Aho, 2016, Lawson et al., 2009, Popesko and Novák, 2011, Weygandt et al., 2010) and others.

The paper contributes to the knowledge of application of modern Full Cost methods and allocating costs in the public sector with focus on the Czech environment. The issue of allocating costs to activities in the public sector was previously investigated by, e.g. Slavici et al. (2011) and Cretu et al. (2010). Concretely, the funding of universities is partly addressed in publications by Hunt et al. (2019), Lowry (2001), Parson et al. (2014), Talpos et al. (2010), Tanberg (2010) and Zámečník and Výstupová (2014). Jovanović et al. (2019) searched cost tracking according to different criteria in the implementation of a full costing method in hospitals.

The structure of the paper is as follows. In the theoretical part, traditional as well as modern approaches to cost management in the private and public sector are presented.

Then, the possibility and suitability of using the ABC and TD ABC methods are discussed. In the next part, research goals, research methods and research questions are defined. Presentation of the main research results together with discussion about the issue follows. In the final part, basic findings of the research are formulated.

## **1 Statement of a problem**

At first sight, the approach to financial and cost management by public sector subjects appears completely different from that of private sector subjects. It is given by the fact that subjects operating in the private sector must “look after” their sources. Therefore, private sector subjects enter the market with the objective of maximising their profit. The objective of profit maximisation is one of the basic differences between the approaches of private and public sector subjects to cost management. Private sector subjects must manage their costs very effectively. Public sector subjects are not allowed to achieve profit during their main activities. Their main objective is the satisfaction of public needs. The achievement of profit may be possible and desirable, if it involves so-called supplementary activities. However, these activities must not be loss-making, and must not be performed to the detriment of the main activity, for which the given subject was established.

It can seem that economic subjects do not need to allocate costs to individual activities more effectively. However, this assumption is illusory. Baird et al. (2004) state that the application of Activity Based Management (ABM) is equally important for both private and public sectors. Nevertheless, according to the results of performed research regarding a comparison of the utilisation of a higher level of cost allocation, i.e. cost allocation linked to activities and calculation concerning operations, utilisation by public subjects in Australia is less frequent than in the private sector. The authors also discovered that the utilisation of ABM is very beneficial for the public sector. It can make the information about actual costs more realistic, but it can also contribute to making the drawing of costs more efficient.

This is also confirmed by Hammer (2011). On the other hand, Hammer admits that cost management in the public sector, specifically organisational state units, is still connected with a high level of inefficiency. At the same time, he adds that in the private sector, application practice in the Czech Republic is still undeveloped, and usually limited to foreign-owned organisations.

Therefore, from the afore-mentioned, it follows that despite the differing reasons for the existence of the given subject, the knowledge of actual costs is important for both the private and public sectors.

Costs can be ascertained using so-called traditional calculation methods, or using the ABC method. A comparison of the approaches of these so-called traditional calculation methods and the ABC method was also made by Altawati et al. (2018), who state that, as a consequence of a competitive environment, companies were forced to switch from traditional calculation methods to a method known as ABC. They also demonstrated that the ABC method is better than traditional calculation methods due to the fact that it provides a competitive advantage in the form of identification of actual costs per subject product.

The fact that the ABC method is prioritised and further modified is also confirmed by Gerwin et al. (2018), who state that the accurate evaluation of actual costs per

service can be very time-demanding, which is why they switch from the regular ABC method to the so-called TD ABC method. Thanks to this method, they can determine the actual costs per provided service. They have demonstrated that the TD ABC model is a powerful management tool which can be used to set a price based on actual costs, and to improve operational efficiency.

Hoozée and Hansen (2018) focused on a comparison of ABC and TD ABC. Using a numerical experiment, they state that the TD ABC approach provides more accurate information if activity sources are known and monitored, unlike a case where activity sources do not have to be taken into account.

Both the public and private sectors are well aware of the ABC method in either traditional or modified versions. Lutilsky and Dragija (2012) studied the ABC method utilisation as a full cost method at European universities, for which the introduction of a full cost methodology was one of their main objectives at that time. They also proclaimed that although the requirements for an efficient management of the university exist, only a small percentage of universities have implemented a cost assignment method so far. As the main obstacles, they listed unwillingness to change, missing data and agendas which would demonstrate the links between objects, costs and legal barriers.

Nevertheless, there are exceptions even in this environment. It is confirmed by the example of the Engineering Faculty at the University of Atacama which requested setting a cost method which would reflect current market requirements. This topic was elaborated by Silva and Nehme (2018), who set the objective of designing a cost system based on the ABC and ABM activities, which would serve as a basis for decision-making and management. Their ABC and ABM model can be applied in every company or institution which wants to know the cost of their products and services regardless of the its character in sense of profit or non-profit subject.

## **2 Methods**

The main aim of the paper is to compare the cost management approaches in the public as well as private sector, putting emphasis on the public sector. The data was obtained by research done in the year 2017 and 2018 in the Czech Republic. The self-selection sampling technique (non-probabilistic sampling) was used to achieve a large sample size. This approach was preferred over simple random sampling which usually results in low response rate and, therefore, inflating the non-response. The self-selection sampling is considered as a convenient sampling technique for the explorative studies although the likelihood of the sample being a perfect representative of the population is low (Saunders, 2016). Survey respondents were identified by students who were responsible for data collection and asked a responsible person (chief financial officer) to fill in a questionnaire. This collection naturally exhibits a selection bias of geographic coverage (Zlín Region). Zlín Region is a region resembles industry characteristics of the Czech Republic and can be considered as an average region by severeral economic indicators. On the other hand self-selection sampling techique lowers the chance of non-response bias as students typically choose companies they work for or write their qualification works at. After collecting the data, companies were divided into profit-making and public sector subjects. In the next step they were divided regarding the size (measured by the number of employees). Overall, the data was successfully obtained from 201 respondents, of which 138 were subjects

from the private profit-making business sector (36 micro, 38 small, 46 medium, 18 large ones), and 63 were subjects from the public and non-profit sector (further public only) (30 micro, 16 small, 13 medium, 4 large ones).

To answer three principle research questions (RQ1, RQ2, RQ3), there were selected questions from the questionnaire and the answers to these were tested using methods of descriptive statistics together with the logistic regression as follows:

To answer RQ1: “Are there any differences in needs and approaches to cost management in the private and public sector?”, questions Q1-Q6 were selected from the questionnaire, Q1, Q4, Q5 and Q6 being tested by the logistic regression.

Q1: Do you account for costs in such a way that the total costs of the given activity can be ascertained at any time?

Q2: Do you use calculations at the full cost level in financial management?

Q3: If you use public funds, do you ascertain full costs for activities financed from public sources only, or for all of your activities (products/sources)?

Q4: Does your accounting unit manage public sources of financing (funds/subsidies from the state budget)?

Q5: Do you express full costs in numbers?

Q6: Do you use management accounting?

To answer RQ2: “Are there any differences in the knowledge and use of the ABC method in the public and private sector?”, question Q7 was selected from the questionnaire.

Q7: Do you use the ABC method within the scope of financial management?

Finally, to answer RQ3: “Are there any differences in the needs for knowledge of full costs as being essential for making financial decisions in the private and public sector?”, questions Q8-Q10 were selected from the questionnaire.

Q8: Do you need to know full costs for individual activities in order to be able to use financial management tools?

Q9: Do you need to know full costs for individual activities in order to be able to make strategic financial decisions?

Q10: Do you need to know how the individual activity/product will affect the company’s total costs?

The empirical analysis was done in two steps. A series of contingency tables analysis by Pearson's Chi-squared Test for Count Data was performed. This allowed us to get an initial perspective on a link between two variables of interest. The logistic regression was used in the second step to assess the strength and significance of relationships while considering more variables. The logistic regression model was selected for the reason of a dichotomous nature of the dependent variable. The regression models were estimated by the maximum likelihood method. The profiled confidence intervals with interpolated profile traces were computed to present 95% confidence intervals of odds ratios. The regression models and confidence intervals were created in the statistical package R 3.5.3 and its library MASS (Venables, Ripley, 2010).

### 3 Problem solving

Tab. 1 lists the resulting values of the tested criteria in relation to question Q1, aimed at ascertaining the answers to whether the subjects account for costs in such a way that the total costs for the given activity can be ascertained at any time. Most of the evaluated subjects in both the public (83%) and private (79%) sectors account for costs in such a way that they are able to ascertain the costs for the given activity at any time. The resulting Chi-square values, and the p-value show that there are no statistically significant differences in either the overall structure of the answers, or within the evaluated groups.

**Tab. 1: Statistical evaluation of question Q1**

Possibilities	Absolute number		Relative number		p-value
	PS	NS	PS	NS	
Yes	109	52	79%	83%	0.5552
No	29	11	21%	17%	0.5552
<b>Chi-square</b>	0.3428				
<b>p-value</b>	0.5582 > 0.05				

Notes: PS: private profit-making subjects; NS: public subjects

*Source: (own calculation, 2019)*

Tab. 2 shows statistical results regarding Q2, of whether the subjects use calculations at the full cost level in their financial management. While 49% of private sector subjects use calculations at the full cost level, only 40% of public sector subjects responded affirmatively. The values of the tested criteria (Chi-square 6.2733; p-value 0.0123) demonstrated that private profit-making subjects utilise calculations at the full cost level statistically significantly more frequently.

**Tab. 2: Statistical evaluation of question Q2**

Possibilities	Absolute number		Relative number		p-value
	PS	NS	PS	NS	
Yes	81	25	59%	40%	0.0124
No	57	38	41%	60%	0.0124
<b>Chi-square</b>	6.2733				
<b>p-value</b>	0.0123 < 0.05				

Notes: PS: private profit-making subjects; NS: public subjects

*Source: (own calculation, 2019)*

A statistical evaluation of question Q3, focusing on whether and when managing public funds, the subjects ascertain the costs for activities financed from public sources only, or for all activities, is to be found in Tab. 3. The results showed that statistically significantly more private sector subjects do not use public funds, which is justified by their nature. Statistically fewer private sector subjects ascertain costs in relation to all activities rather than those financed from public sources too.

**Tab. 3: Statistical evaluation of question Q3**

Possibilities	Absolute number		Relative number		p-value
	PS	NS	PS	NS	
Only for activities from subsidy sources	25	16	18%	25%	0.2340
We do not manage public funds	86	18	62%	29%	<0.00001
For all activities	27	29	20%	46%	0.0001
<b>Chi-square</b>	21.5197				
<b>p-value</b>	0.000021 < 0.05				

Notes: PS: private profit-making subjects; NS: public subjects

Source: (own calculation, 2019)

Tab. 4 presents an overview of statistical results concerning question Q4 – an accounting unit managing public sources of financing. The results show that most of public sector subjects (73%) manage public sources of financing compared to 36% of private sector subjects. The values of the tested criteria (Chi-square 24.4145; p-value <0.00001) demonstrated statistically significant differences in the overall structure of the answers.

**Tab. 4: Statistical evaluation of question Q4**

Possibilities	Absolute number		Relative number		p-value
	PS	NS	PS	NS	
Yes	49	46	36%	73%	<0.00001
No	89	17	64%	27%	<0.00001
<b>Chi-square</b>	24.4145				
<b>p-value</b>	<0.00001 < 0.05				

Notes: PS: private profit-making subjects; NS: public subjects

Source: (own calculation, 2019)

Tab. 5 provides an overview of statistical results related to question Q5 – expressing full costs in numbers. The results show that there are no statistically significant differences in answering the Q5 (Chi-square 2.6813; p-value 0.101534).

**Tab. 5: Statistical evaluation of question Q5**

Possibilities	Absolute number		Relative number		p-value
	PS	NS	PS	NS	
Yes	82	45	59%	71%	0.101
No	56	18	41%	29%	0.101
<b>Chi-square</b>	2.6813				
<b>p-value</b>	0.101534				

Notes: PS: private profit-making subjects; NS: public subjects

Source: (own calculation, 2019)

Tab. 6 shows an overview of statistical results for question Q6 – using management accounting. There were revealed no statistically significant differences in answering the Q6 (Chi-square 3.3494; p-value <0.06723).

**Tab. 6: Statistical evaluation of question Q6**

Possibilities	Absolute number		Relative number		p-value
	PS	NS	PS	NS	
Yes	65	21	47%	33%	0.0672
No	73	42	53%	67%	0.0672
<b>Chi-square</b>	3.3494				
<b>p-value</b>	0.067229				

Notes: PS: private profit-making subjects; NS: public subjects

Source: (own calculation, 2019)

**Tab. 7: The results of logistic regression for RQ1**

	Estimate	Std. error	Z value	Pr(> z )
(Intercept)	-0.4162	0.4569	0.911	0.362367
NS	-0.5436	0.5509	-0.987	0.323836
Q1 yes	1.4063	0.3986	3.529	0.000418 ***
Q4 no	-0.7321	0.4186	-1.749	0.080283.
Q5 external (Q5E)	0.6164	0.5256	1.173	0.240920
Q5 internal (Q5I)	0.6522	0.3882	1.680	0.092905.
Q6 yes	1.1787	0.4037	2.920	0.003498 **

Notes: Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

Source: (own calculation, 2019)

Based on the logistic regression, it can be stated that regarding the statistical hypothesis, there is the null effect as for the need for finding out about full costs no matter what type of the sector an organization is part of (Q1); if organizations manage public sources of financing (Q4); if the costs are entered in the accounts separately (Q5E). Also, there is the null effect as for the need for finding out about full costs related to the reason why an organization keeps records of full costs (Q5I) and to the aspect whether an organization uses management accounting (Q6). (The hypotheses for Q1, Q4 and Q5I were not rejected at the 95% significance level. The hypothesis for Q5E and Q6 was rejected at the 95% significance level.) Thus, to answer RQ1, it can be proclaimed that there is no evidence of the aspect if an organization is part of the private or public sector and therefore influencing the need for finding out about full costs. However, it can be stated that there is a higher chance that an organization will strive to find out about full costs if it uses management accounting, which is seven times higher. In the case when an organization keeps records of costs of particular activities separately, the chance is even nine times higher.

The results in Tab. 8 show that most of the subjects in both the private (94%) and public (97%) sectors do not use the ABC method during cost management. The values of the tested criteria did not confirm statistically significant differences in the overall structure of the answers (p-value 0.4276) and inside the individual groups.

**Tab. 8: Statistical evaluation of question Q7**

Possibilities	Absolute number		Relative number		p-value
	PS	NS	PS	NS	
Yes	8	2	6%	3%	0.4295
No	130	61	94%	97%	0.4295
<b>Chi-square</b>	0.6292				
<b>p-value</b>	0.4276 > 0.05				

Notes: PS: private profit-making subjects; NS: public subjects

Source: (own calculation, 2019)

**Tab. 9: The results of logistic regression for RQ2**

	Estimate	Std. error	Z value	Pr(> z )
(Intercept)	0.65053	0.26834	2.424	0.0153*
NS	-0.03111	0.41514	-0.075	0.9403
Q7 (Do not know)	0.32580	0.32916	0.990	0.3223
Q7 (Yes, using it)	1.55298	1.08686	1.429	0.1530

Notes: Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' 1

Source: (own calculation, 2019)

As in the previous RQ1, the statistical hypothesis regarding the effect of a difference between the private and public sector with regard to finding out about full costs was rejected at the 95% significance level, which means that the approach of the sectors is the same. Based on the logistic regression model, it can be proclaimed that the statistical hypothesis for RQ2 regarding the effect of the fact that an organization uses or does not use the ABC method to find out about full costs was not rejected at the 95% significance level. Therefore, knowledge of the ABC method does not increase the chance of an organization to strive for the information about its full costs.

Question Q8, aimed at ascertaining whether the utilisation of financial management tools in the examined subjects is contingent on the knowledge of full costs of individual activities, is evaluated in Tab. 10. Most (60%) of the examined private sector subjects require the knowledge of full costs of individual activities to utilise financial management tools. As for the public sector subjects, only 49% responded affirmatively. None of the tested criteria confirmed statistically significant differences in either the overall structure of the answers or within the evaluated groups.

**Tab. 10: Statistical evaluation of question Q8**

Possibilities	Absolute number		Relative number		p-value
	PS	NS	PS	NS	
Yes	83	31	60%	49%	0.1471
No	55	32	40%	51%	0.1471
<b>Chi-square</b>	2.1082				
<b>p-value</b>	0.1465 > 0.05				

Notes: PS: private profit-making subjects; NS: public subjects

Source: (own calculation, 2019)

The contingency of making strategic financial decisions based on the knowledge of full costs of individual activities was the subject of research in Q9. The statistical evaluation of Q9 in Tab. 11 confirms the finding related to question Q8. Most (65%) private sector subjects make strategic financial decisions based on the knowledge of full costs, whereby statistically significant differences were not discovered in either the overall structure of the answers or within the individual groups.



**Tab. 11: Statistical evaluation of question Q9**

Possibilities	Absolute number		Relative number		p-value
	PS	NS	PS	NS	
Yes	90	33	65%	52%	0.0836
No	48	30	35%	48%	0.0836
<b>Chi-square</b>	3.0013				
<b>p-value</b>	0.0832 > 0.05				

Notes: PS: private profit-making subjects; NS: public subjects

Source: (own calculation, 2019)

Tab. 12 shows an evaluation of the results for question Q10, aimed at ascertaining whether the subjects examine how individual activities affect the company's total costs. Regarding this question, most private (76%) and public (63%) subjects responded affirmatively, whereby statistically significant differences related to the ascertained tested criteria values (Chi-square 3.4139; p-value 0.0647) were not revealed in either the overall structure or within the individual groups.

**Tab. 12: Statistical evaluation of question Q10**

Possibilities	Absolute number		Relative number		p-value
	PS	NS	PS	NS	
Yes	105	40	76%	63%	0.0643
No	33	23	24%	37%	0.0643
<b>Chi-square</b>	3.4139				
<b>p-value</b>	0.0647 > 0.05				

Notes: PS: private profit-making subjects; NS: public subjects

Source: (own calculation, 2019)

**Tab. 13: The results of logistic regression for RQ3**

	Estimate	Std. error	Z value	Pr(> z )
(Intercept)	0.1198	0.2522	0.475	0.63481
NS	0.1223	0.4336	0.282	0.77783
Q8 Yes	1.3638	0.4224	3.229	0.00124 **
Q9 No	0.1571	0.4171	0.377	0.70645

Notes: Signif. codes: 0 '\*\*\*' 0.001 '\*\*' 0.01 '\*' 0.05 '.' 0.1 ' ' ; NS: public subjects

Source: (own calculation, 2019)

Based on the logistic regression data, it can be proclaimed that there exists a nine times higher chance that the organizations having the need for the knowledge of full costs for the purpose of making use of financial management tools will strive to find out the information about full costs. The research has not proved that the organizations having the need for the knowledge of full costs for the purpose of strategic financial management would increase their chance of having the need for the knowledge of full costs.

## 4 Discussion

The results of descriptive statistics led to the finding that most of the examined subjects in both the private and public sectors do not use the ABC method in their cost management and record-keeping. This was supported by no statistically significant differences between the two groups. Even though there is no difference, as for the private or public sector, in approaches to finding out about full costs, 83% of public sector subjects and 79% of private sector subjects account for costs in a manner which

enables them to ascertain the total costs for a certain activity. Furthermore, it has been discovered that the examined subjects in both sectors investigate how individual activities affect the company's total costs. Based on these findings, it can be concluded that although most of the examined subjects do not apply the ABC method for managing and keeping records of their costs comprehensively to all costs or all activities, they try and are able to ascertain the full costs of individual activities from the existing records. One of the reasons may be the difficulty as well as related financial demands regarding the application of the ABC method to all of the company's costs. The research has proved that in case the subjects use financial management tools, there is a stronger need for the knowledge of full costs.

It can be stated that the afore-mentioned results correspond to the findings resulting from research done within the scope of this issue in the Czech Republic in recent years – e.g. Hammer (2011), Otrusínová (2016), Otrusínová and Kulleová (2019) and Máče (2018).

However, it should be noted that some financial management tools are commonly used by both sectors and are part of their everyday life. These are tools for planning, setting the goals, comparing the plan with reality, evaluating deviations and determining remedies. However, it has not been proved that the private sector subjects would act differently than the public sector subjects as for the approach to finding out about full costs, thus having different needs for finding out about full costs. It can be assumed that the private sector subjects as well as the public sector ones are aware of the positives of knowledge of full costs. The degree and extent of finding out about full costs is thus the area of further research.

## **Conclusion**

The aim of this paper was to compare the cost management approaches as a prerequisite for an effective financial management in the public as well as private sector, placing emphasis on the public sector.

The research has not proved that the sector an organization is part of, thus being active in the public or private sector, would influence the needs for finding out the information about full costs as the main prerequisite for an effective financial management. On the other hand, the research has proved that if organizations keep records of management accounting, there is a higher chance that these subjects really strive to find out the information about full costs and therefore meet the requirement of an effective financial management.

Despite of some limitations of the study, e. g. the regional character of the research (using only a sample of companies in the Czech Republic), this study is very important for realizing the importance of full cost method in the public sector, mainly at public universities. All of it for the reason that the mechanisms for funding public universities require a comprehensive monitoring of costs. In the event that a university is aware of sources for its real costs, it can realistically plan the necessary funding of its activities and assess whether the activities are based on financial sustainability. Many public sector organizations have already used the full cost method, even though in its simpler form.

One of the key strategic decisions consists of the steps to optimize costs, which affect the security of long-term financial stability. In terms of management strategy,

however, it is not sufficient to ensure cost optimization; it is also needed to address the issue of choice of appropriate sources to refund costs with respect to future development. The actual full cost method as the basis for controlling methods is significant also in terms of planning, not only for the purpose of planning costs, but also revenues.

It will be important in the near future to research how public sector subjects, especially universities will be successful in determining full costs using the ABC method, while taking into consideration the specifics of multi-source financing.

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