



METHODOLOGY FOR THE SELECTION OF FINANCIAL INDICATORS IN THE AREA OF INFORMATION AND COMMUNICATION ACTIVITIES

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Received 01 Feb. 2013; accepted 31 Mar. 2013

Abstract. The article presents issues of performance measurement. Currently, the performance plays an important role in management of companies. Usually, it could be defined as a system that uses the information to produce the appropriate changes in organizational culture, systems and processes to achieve optimal performance agreement targets, allocation of resources, information management on possible modifications of business strategy or sharing the results continued individual goals. In many cases, the performance is very crucial competitive advantage in the market. Due the performance monitoring the companies can find the Key Performance Indicators, also known as KPIs that help to organization define and measure progress toward organizational goals. The main aim of the paper is to find which factors of corporate performance system are in Czech companies important. To find these factors was used theoretical information from the area of KPIs and data from primary research (questionnaire survey). This data are applied by statistical evaluation of selected indicators which can help determine the significance of the indicators in the monitored area.

Keywords: performance, measurement, key performance indicators, competitiveness, Czech Republic, information and communication activities.

JEL Classification: L21, L25, M21

Introduction

The theme of this paper is the performance measurement, which can help to companies organize to achieve strategic goals in day-to-day activities. Indicators, that are used, are taken as the performance indicators. This is a group of indicators that focus on the most critical areas for current and future development of the company. As we mentioned in the abstract of this paper, the performance is very crucial competitive advantage in the market and it should be in the interest of the enterprises monitor key indicators and factors.

The company can improve performance by creating and implementing such a system performance measurement and management, which will be used in accordance with the vision and strategy of the company and will integrate the different views of the performance – a view of the customer, the business owner, manufacturing and

financial manager. Historical perspective on performance measurement and management shows the evolution from traditional approaches based on the measurement of financial standards – profit, profitability, cash flow approaches to modern measurement value for the owners and shareholders (Aschenbrennerová 2010).

Businesses operating in industrial markets are much more sensitive to sales volume in comparisons with companies in the consumer market. Important problem in companies is that they do not measure own performance at the customer level, especially on a misunderstanding of the results obtained from previous successful marketing programs (Zahay, Griffin 2010).

The main aim of the paper is to present theoretical information from the area of Key Performance Indicators connected with data from primary research. This data are applied by

statistical evaluation, especially by factor analysis. A statistical evaluation of selected indicators can help determine the significance of the indicators in the monitored area.

1. Theoretical background

Performance measurement is an important tool for sustainable management. Well-defined indicators can potentially support the identification of current and desired performance and provide us with information on the progress of individual performances (Muchiri *et al.* 2010; West 2011). In addition, it can be a link between strategy and management, thereby promoting the establishment and implementation of initiatives related to the improvement company (Maria 2009).

Measurements can be divided according to the type of key indicators and results. The measurable indicators should be divided according their essence to several groups (Smith 2008; Zaherawati *et al.* 2011; Samsonova, Buxman, Gerteis 2009; Kocmanová, Karpišek, Klímková 2012):

- Result indicators are focused on achieving the objectives of indicators (Key Goal Indicators – KGI). They represent a measure of success and verification success. Indicate whether the goal has been achieved.
- Critical success factors (CSF) includes the elements, which are essential for businesses to achieve their goals. They are used to manage, control and trace of the actions, which are necessary to achieve results. Once aware of these critical success factors is to determine key performance indicators easier.
- Performance indicators (efficiency) are focused on performance measurement and its support (Key Performance Indicators – KPIs). They are used to quantify objectives to reflect the performance of a process or service. They are usually used for measuring the value, efficiency, quality, and customer satisfaction. Indicators, contained in KPIs, must reflect business objectives, must be measurable and should become a key to success.
- Key Result Indicators (KRIs) includes information about many activities which have done and if company goes to right direction. KRIs provide such information which are prepared mainly for top management.

KPIs could help to companies manage own priorities in various fields – environmental, governmental or social. These fields are linked with corporate strategy and usually include many non-financial indicators, for which exist relevant information (Kocmanová, Dočekalová 2011).

As the author Marinič (2008) and Parmenter (2010) mentioned, once defined the correct key indicators that reflect goals of the company (those that can be measured), it is possible to use these performance indicators as a tool for performance measurement. It depends on the perspective

how entities inside and outside the company approach to performance process, and why they monitor own performance.

Measuring performance is quite difficult process. According Turban and Volonino (2010) measuring process needs to ensure four conditions:

1. Identify the most useful indicators;
2. Use them through correct measuring;
3. Chose set of measures which provides indicator of total corporate performance;
4. Define to whom is set intended.

Performance system can rise by using selected tools, mainly by creating and implementing system of performance measurement and management, which will be used in accordance with the vision, mission and strategy of the company and will integrate different perspectives on corporate performance (De Lima, da Costa, Angelis 2009).

Typical examples of KPIs should be market share, economic value added per employees, Return on capital employed, Return on equity or number of employees. These indicators are possible to involve into financial indicators (O'Sullivan, Abela, Hutchinson 2009). The KPIs includes huge amount of individual indicators of different fields (Hřebíček, Soukopová, Štencl, Trenz 2011; Kocmanová, Hornungová, Klímková 2010).

2. Materials and methods

The first part of the paper presents main secondary information, which was processed by many scientific articles and literature. Authors of the paper are interested in the area of performance measurement. The next, and the main part of the paper, is to introduce research data that was obtained from the primary research. Whole primary research was focused on the performance evaluation of enterprises (in the area of economic, social and environmental performance) in the Czech Republic. The primary research was designed by questionnaire survey, focused on IT and agriculture companies in Czech Republic in 2011. The questionnaire was sent to 32 companies, from which answer only 23 companies. The conditions for choice were:

1. size of company (number of employees over 250);
2. geographical location (Czech Republic);
3. classification of economic activities according to CZ-NACE, reduced to information and communication area;
 - 60 - Programming and broadcasting activities,
 - 61 - Telecommunications,
 - 62 - Computer programming, consultancy and related activities,
 - 63 - Information service activities).

Basic sample was made by 32 companies to which were the questionnaire sent. From this amount of 32 companies we received answers from 23 companies (effectiveness was almost 72%).

In the paper there is utilized only one part of economics area. This count has been designed in different industry fields. From point of view of factor analysis this sample is adequate.

Results and discussion of the paper are based on the analysis of secondary sources and selected data of questionnaire survey, which are involved on measuring the performance of Czech companies. To process the results of the questionnaire survey were used both of basic types of descriptive statistics and factor analyze on the selected data set. The data were processed by using the statistical program IBM SPSS Statistics 20.

3. Results

It is clear from analysis of results that companies usually use for measuring performance and corporate effectiveness different indicators. Based on the analysis of statistical characteristics of the examined group we will present our conclusions as approximate result, which is limited by the resulting reliability. In the results of the paper there are characteristics of research barriers and next research possibilities.

Table 1 includes rudimentary data where are clear that companies use in performance measurement system mainly return indicators, cash-flow indicators and profit indicators. The conclusions are given by the characteristics of the limits of research and its possible future direction.

Based on the analysis of descriptive statistical characteristics of the sample, our conclusions will be presented as an explorative result limited by the resultant reliability. The conclusions provide characteristics of the limitations of our research and its potential further direction. If the value of the Coefficient of variation is under 0.10, it indicates low variability, and arithmetic mean can be considered as typical value of the data file. Other way round, if the value is near to 1.00, it denotes high variability; arithmetic mean cannot be typical value. For this reason, it is appropriate to focus on

lower values. The maximum of results of the Coefficient of variation from questionnaire survey is 0.202. That means in all components could be mean accepted as typical value (see Table 1).

Factor analysis gives up reduction of surveyed corporate performance indicators which, companies use in own measurement process. Main input into factor analysis was correlation matrix where showed individual correlation values of the chosen indicators are (see Table 2).

From the values, listed in the Table 2, is possible to say that correlations exist only on five relations they are highlighted. These relations are:

- Free cash flow and EBIT (0.529);
- Market share and Free cash flow (0.529);
- Value added per personal costs and Value added (0.520);
- Value added per employee and Value added per personal costs (0.662);
- Market share and Value added per personal costs (0.580).

To the KPIs is possible to insert only Market share and Value added per employee. Free cash flow, EBIT and Value added per personal costs could be involved in KRIs.

Explained total variance of inputs in factor analyze describe process of extraction. Beginning of extraction (Initial Eigenvalues) comprehends whole components which were put into extraction. Second step (Extraction Sums of Squared Loadings) according the key (Eigenvalue > 1) are reduced to the four strongest components which are used in next processing. Last step (Rotation Sums of Squared Loadings) show differences in individual components.

From this point of view there is important Extraction Sums of Squared Loadings with cumulative percentage. Factor analysis extracted only two factors, which explain almost 70% of variance (exact amount was 69.773%). This result confirms good factor result of interpreted variance.

Table 1. Basic statistics indicators

	EBT	EBIT	EAT	Operating cash flow	Total free cash flow	Free cash flow	Profit margin	Size turnover	Value added	Value added per personal costs	Value added per employee	Market share
Mean	3.61	3.13	3.83	3.43	3.48	2.87	3.52	3.74	3.09	1.91	2.65	2.30
Standard deviation	0.891	1.290	0.491	0.843	0.898	1.359	0.665	0.541	1.311	1.345	1.496	1.259
Variance	0.794	1.664	0.241	0.711	0.806	1.846	0.443	0.292	1.719	1.810	2.237	1.585
Coefficient of variation	0.049	0.094	0.121	0.024	0.155	0.160	0.201	0.137	0.066	0.156	0.202	0.175

Source: own research

Table 2. Correlation Matrix

	EBT	EBIT	EAT	Operating cash flow	Total free cash flow	Free cash flow	Profit margin	Size turnover	Value added	Value added per personal costs	Value added per employee	Market share
EBT	1	0.125	0.045	0.418*	-0.096	0.219	0.207	-0.033	0.225	0.311	0.200	0.232
EBIT	0.125	1	-0.178	-0.138	0.415	0.529	0.129	0.181	0.020	0.295	-0.187	0.478
EAT	0.045	-0.178	1	0.410	0.094	0.033	0.151	-0.007	0.307	0.114	0.285	-0.278
Operating cash flow	0.418*	-0.138	0.410	1	0.133*	-0.107	0.144	0.360*	0.499*	0.275	0.341*	0.041
Total free cash flow	-0.096	0.415*	0.094	0.133	1	0.314*	0.324	0.456	0.272*	0.149	0.062	0.308*
Free cash flow	0.219	0.529**	0.033	-0.107	0.314	1**	0.481	0.075	0.236**	0.516	0.245	0.529**
Profit margin	0.207	0.129	0.151	0.144	0.324	0.481	1	0.395	-0.106	0.205	0.282	0.236
Size turnover	-0.033	0.181	-0.007	0.360	0.456	0.075	0.395	1	0.226	0.155	-0.005	0.255
Value added	0.225	0.020	0.307	0.499*	0.272	0.236	-0.106	0.226	1	0.520	0.503	0.314
Value added per personal costs	0.311	0.295	0.114	0.275	0.149	0.516	0.205	0.155	0.520	1	0.662	0.580
Value added per employee	0.200	-0.187	0.285	0.341	0.062	0.245	0.282	-0.005	0.503	0.662	1	0.131
Market share	0.232	0.478*	-0.278	0.041	0.308	0.529*	0.236	0.255	0.314*	0.580	0.131	1*

* Correlation is significant at the 0.05 level

** Correlation is significant at the 0.01 level

Source: own research

Table 3. Rotated Component Matrix

	Profit	Value added
Free cash flow	0.779	0.266
EBIT	0.870	-0.203
Market share	0.779	0.275
Value added	0.129	0.770
Value added per personal costs	0.503	0.761
Value added per employee	-0.063	0.907
Cronbach's alpha	0.759	0.793

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization. Rotation converged in 3 iterations.

Source: own research

Total variance of the performance indicators is explained due eigenvalues, which represents the total variance explained by each factor. The eigenvalues found own figures and only two components have figures more over or is very close to 1. That means the two components make almost 70 % of total variance of all four components.

In extraction were divided all components into new two strongest component groups. These new component groups have diverse depth with previous four components (see Table 3).

4. Discussion

Cronbach's alpha is a measure of internal consistency, that is closely related to a set of items are as a group. A "high" value of alpha is often used (along with substantive arguments and possibly other statistical measures) as evidence that the items measure an underlying (or latent) construct. However, a high alpha does not imply that the measure is unidimensional. If, in addition to measuring internal consistency, you wish to provide evidence that the scale in question is unidimensional, additional analyses can be performed. Exploratory factor analysis is one method of checking dimensionality. Cronbach's alpha is not a statistical test; it is a coefficient of reliability (or consistency). It could be written as a function of the number of test items and the average inter-correlation among the items. Below, for conceptual purposes, we show the formula for the standardized Cronbach's alpha:

$$\alpha = \frac{N \times \bar{c}}{\bar{v} + (N - 1) \times \bar{c}}, \quad (1)$$

where **N** is equal to the number of items,

c-bar is the average inter-item covariance among the items,

v-bar equals the average variance.

If would increase the number of items (**N**), is it possible to increase Cronbach's alpha. Moreover, if the average inter-item correlation is low, alpha will be low. As the average inter-item correlation increases, Cronbach's alpha increases as well.

Values of Cronbach's alpha could be reached from 0 to 1. If the values would be close to 0.5, it signifies bad quality of internal consistency. Over 0.7 the value is acceptable and values close to 1 mean excellent.

According our results, values of Cronbach's alpha were for Profit group in acceptable level, and for group of Value added almost in good level.

First group depths especially "Free cash-flow" and "Market share". Second group impregnates primarily "Value added per employee" and "Value added per personal costs". That means the informative value of the indicator is very credible. These two groups define two synthetic dimension of view on measuring performance with impact on managerial decision.

In order to assess, whether it is possible to use factor analysis, was used Kaiser-Meyer-Olkin method (KMO) and Bartlett's test of sphericity. KMO method is based on selective correlation and partial correlation coefficients. Value range of KMO is between 0 and 1. Each variable correlates perfectly with itself (approximate to 1), but has no correlation with the other variables (approximate to 0). In our case KMO reached value of 0.655, what means that the performed level of usefulness of factor analysis is at average level.

Bartlett's test of sphericity is statistic test that is used to examine the hypothesis that the variables are correlated or uncorrelated. There was found no correlation with other variables (Sig = 0.000). Nevertheless, Bartlett's Test of Sphericity is significant because of the value which is lower than 0.05.

Conclusions

The correct choice of performance indicators is important part of the corporate strategic process. The definition of performance indicators is quite difficult because of complexity of measureable areas.

Limitation of this paper is focusing on domestic companies. Therefore it is necessary to do next researches where is possible to use knowledge not only in domestic environment, but especially in international environment to ascertain the influence of corporate performance measurement system.

Despite a great progress in the understanding and utilization of findings and experience with marketing management by companies in the Czech environment. Our research showed that there is large space for improvement and can offer new and new ways for companies to be competitive.

Company is able to create a comprehensive performance evaluation system that measures the economic indicators and thus can assess how strong the company is on the overall. Complex assessment of company is much better and more effective than individual performance measurement. The reason for this is mainly the fact that only some of the indicators are directly measurable and comprehensive evaluation is necessary to take into account both indicators long and short term performance.

The article is focused on the area of economic performance in relation to KPIs. Currently more and more companies use in their management performance measurement that is important not only for the actual management, but also for other interested parties involved in the entity with each other stakeholders. Performance measurement is an important tool for sustainable management. And sustainability is a term that can be more and more often heard from various areas of the Czech environment.

The aim of the article is to present application of theoretical information from the area of Key Performance Indicators (KPIs) connected with the data from primary research. This data were applied by statistical evaluation by factor analysis. Data for

this article were obtained from the project funded by the Grant Agency (Czech Science Foundation), named "Construction of Methods for Complex Multifactor Assessment of Company Performance in Selected Sector", No. P403/11/2085.

Empirical research deals with factor analysis that gives up reduction of surveyed corporate performance indicators which companies use in own measurement process. Main input into factor analysis was correlation matrix. From this matrix were obtained data that tell us, that in our case correlations exist only on four economic indicators (Free cash flow, Value added per personal costs, Value added per employee, Market share). Then we found two strongest component groups. In connection with the KPIs it is possible to insert only Market share and Value added per employee. Free cash flow and Value added per personal costs could be involved in KRI.

If company declares that is efficient and effective, it should be able to demonstrate with indicators, standard or other procedures it used. Companies would not miss comparison with direct competitors in industry area as is shown by current level of knowledge. That is possible with suitably selected indicators, according to using tools, whether financial or non-financial (Milichovský, Solčanský, Sychrová 2011).

Acknowledgements

This paper is supported by the Czech Science Foundation. Name of the Project: 'Construction of Methods for Multifactor Assessment of Company Complex Performance in Selected Sectors'. Registration No. P403/11/2085.

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