

# Measuring Company Management Efficiency: The Case of Real Sector of Economy

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**Abstract:** The paper presents theoretical framework for measuring managerial efficiency applicable for goods and services producing companies which based upon the closed list of general management functions introduced in the paper. The list of formalized and non-formalized criteria of management functions performance quality is formed within the suggested framework on the basis of qualitative and quantitative analysis. This set of criteria is used in order to estimate company's management quality rating which becomes the basis for management result estimation. It is also assumed that management system is costing company more than direct costs on its maintenance. The criteria of management entropy are presented in the paper, and this criterion is used for estimating real costs of management system performance. Henceforth efficiency of company management performance can be estimated as a ratio of corrected results and costs of management system performance.

**Key words:** performance and effectiveness; organization; structure; conceptual

**JEL codes:** M00, M10

## 1. Introduction

Measuring management system efficiency is one of major problems in contemporary world. It's which importance came into focus once again in times of global economic crisis. At this period it was mentioned a lot of times that hired managers were leading their companies to short-term results (which usually were the basement for bonuses estimation) which in a few cases were actually adulterated. This behavior can lead to the following problems. First, pursuit for short-term results can lead to long-term losses which can not be foreseen at the point of first results estimation. Second, it leads to growth of mistrust on the market which in return is decreasing the desire of possible investors or entrepreneurs to risk-due to the fact they feel they can be cheated by management. Those problems can be partly solved in case there would be a reliable instrument for quantitative measurement of management system efficiency which would allow the owner to understand what kind of effect hired managers produce: positive or negative.

One can also figure out a few reasons why the described problem is not solved up to now. In the first place, there is a problem of measuring the results achieved by management system. Those results are not equal to financial results achieved by the organization (though some researches (for example, Ushvitsky, Parakhina and Vasilyev, 2007) suggest they can be considered equal for estimation of managerial efficiency), at least due to the fact there is empirical evidence when companies achieved better results because their employees where ignoring

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managers' instructions while obeying informal leaders. This means that in order to measure management system performance efficiency one has to somehow extract the results of management system performance from the results achieved by the company. Second, the results achieved by company's management are being measured only in monetary terms though most of contemporary management concepts suggest there are at least some non-financial results (for instance, balanced scorecard) which are influencing company's profits. This is most obvious in real sector of the economy, so the one measuring management performance efficiency has to deal with a problem of monetary valuation of non-financial results achieved by the system of management. The third problem is the problem of estimating the customer interested in managerial efficiency measurement results. As it was mentioned, efficiency of management performance for managers themselves, investors and entrepreneurs or owners are quite different which should affect measuring instruments used by them. In this paper management efficiency measurement would be looked at from the owner's point of view. This means that maximum efficiency occur in case when company is achieving good results during a long period of time with minimum costs possible. Finally, the fourth problem with measuring managerial efficiency is that not only the results achieved by management system are unclear but the costs produced by management system are hard to be defined as well. Usually management costs are considered equal to cost of management system maintenance from accountant's point of view (Drury, 1997; Kerimov and Minina, 2002; Atkinson, Banker and Young, 2007). But this approach seems somewhat incorrect since there also are costs which occur due to mistakes of the company management which, in authors' opinion, should also be taken into consideration in order to define the level of management efficiency. All of the above means that management efficiency measuring instruments should be developed taking stated problems into account and allows making main hypotheses:

Hypotheses 1: Efficiency of management system can be quantitatively measured.

Hypotheses 2: Measurement of the effect of management system performance requires estimation of management quality level and considering this level within valuation process.

Hypotheses 3: Management costs include not only explicit costs, but also hidden ones produced by managerial mistakes.

## **2. Framework for Management System Efficiency Measuring**

Solution of the managerial efficiency management measuring problem concerning the need for multidimensional management requires a creation of closed list of such dimensions (which would become a framework for processing hypotheses 2). An attempt to develop such a list was made, for example, within balanced scorecard concept (Kaplan, Norton, 1996) or within cultural transformation tools methodology (Barrett, 1997). But the main problem with those concepts in terms of managerial efficiency measuring problem is that they are dealing with the costs and results of company performance rather than performance of management system. But in order to measure results and costs produced by the system of management in case of estimating management system efficiency it is preferable to use a closed list of dimensions focusing on management process and structure of management performance itself. Classical management theory suggests that system of management is operates by means of management functions performance (starting with Fayol, 1930) or as a number of interrelated processes (see for example ISO standards). For quantitative measurement of management performance one needs some rigid construction so a set (closed list) of management functions would be in that case preferable.

For the purpose of this research we had chosen to look at the process of management as a complex performance of management functions. In classical theory of management there are five general functions of management (planning, organization, motivation, coordination and control) (see for example Griffin, 2003; Robbins and Coulter, 2007) the contents of which were revised within post-industrial and informational economy. For instance, management nowadays should consider dependence from other enterprises present in company's value chain, the situation of over-supply economy (which takes start in 1980 roughly), global focus on sustainable management and some other specific features which are influencing contemporary planning, organization, motivation, coordination and control. At the same time since Fayol the list of management functions itself had been revised and expanded. The following functions were considered as general functions of management by various authors: regulation and analysis (Smolkin, 1999), rationing, record keeping, regulation and stimulating (Paramonov, 1989), forecasting, regulation, record keeping, analysis, policy forming and responsibility (Goldstein, 2006), forecasting and goal setting (Popov, 1973). As we can see the amount of management functions is quite wide taking into consideration there are also special management functions such as logistics, marketing, production, supply etc. This means that in order to use a list of functions as a specification of actions on which management system spends resources the space of management functions should be somehow organized.

At first we need to mention that some functions that management system is performing in contemporary companies are missing from the list above. As it was pointed by Galbraith in "New Industrial Society" the companies are building technostructure; later the phenomena was studied thoroughly and named "development of organizational culture"—a set of informal contracts within the company which allow management achieve its goals using informal methods of management. Henceforth building organizational culture can be considered management function as well. Second, contemporary companies are putting a lot of effort into becoming society-friendly by means of being socially responsible. There is a lot of literature available on the issue of corporate social responsibility and the researches mainly agree that corporate social responsibility normally leads to increase in company performance. This means that forming the basement for corporate social responsibility can also be considered general management function, so the list of general functions should be expanded by those two.

The other thing that needs to be done in order to create a closed list framework for measuring management efficiency is to organize all mentioned by the authors general and special functions in some distinct order. Structuring the above stated functions one can focus on the following idea: some of the functions lead to achievement of management's main goals (planning, organization, motivation, coordination, control, informal organization—building organizational culture and developing corporate social responsibility) while other allow management to perform those general functions better (that is rationing, regulation, stimulation, record keeping, analysis, goal setting, forecasting etc.). The first set of functions henceforth can be addressed as basic general functions while the second set of functions can be named auxiliary general functions; it means, that management functions can be organized into three main dimensions as it is shown of Figure 1.

As it can be seen from the figure all management functions are interrelated and it is impossible to perform basic general without auxiliary general or special functions; but presented organization of management functions allows creating a closed list of functions performed by management system which includes seven basic general functions show on Figure 1.

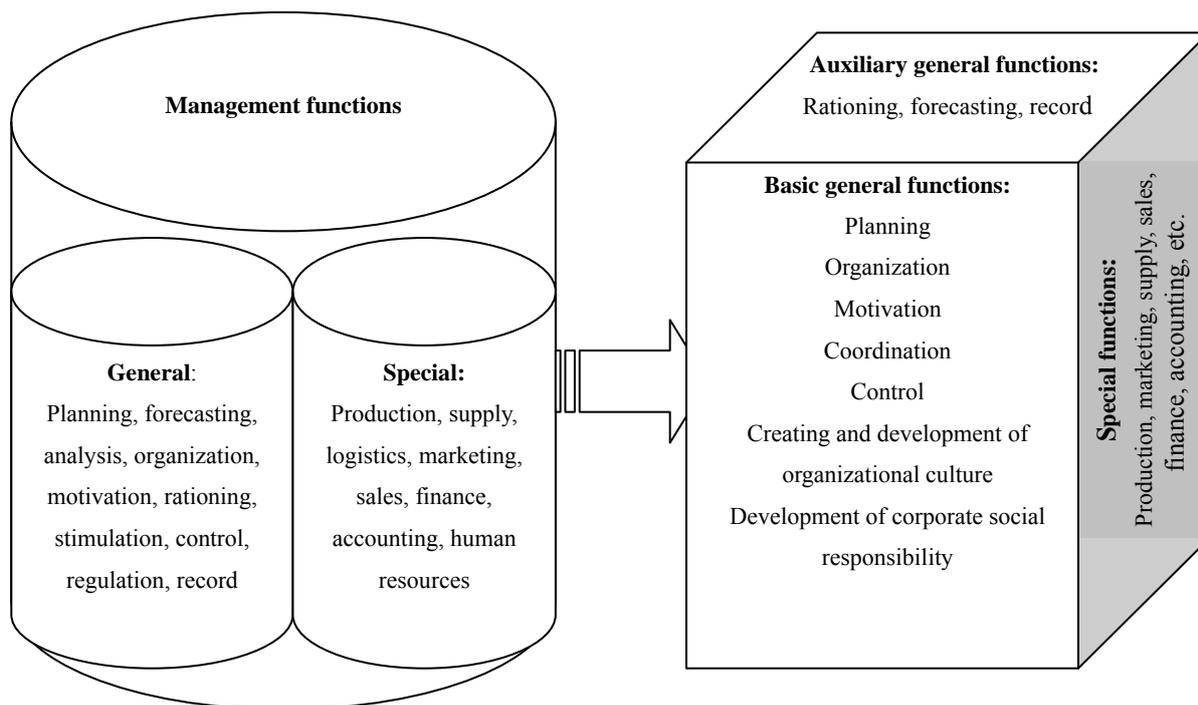


Figure 1 Restructuring Management Function Set

Later in this paper we will be creating a set of criteria for estimating the quality of performance for those seven functions, and this set would be used as a framework for management efficiency estimation.

### 3. Quality of Basic General Management Functions Performance Measuring

The next step on the way of estimating management system efficiency is to build up a set of criteria describing the quality of each basic general management functions performance. In order to create this set of criteria and estimate importance of each one of them an expert questionnaire was developed and offered to managers and experts from 195 Russian regional small, medium-sized and big enterprises doing business in real sector of economy (there were companies operating only within local or regional market as well as companies operating on the national and international level, which makes the achieved results reliable). In case of each function primary list of criteria was created on the basis of managers' and experts' opinion and included from 20 (for corporate social responsible responsibility development) up to 67 (for motivation) criteria which were mentioned by the respondents at least three times. After that linear correlation analysis considering each criteria and management effectiveness (in terms of achieving the results stated by management) was carried out. After that only criteria showing strong relation to those results were left on the list for further quality of management function performance estimation. The list of criteria which is suggested to be used in order to estimate the quality of planning is shown in Table 1.

The first criterion is a simple one and does not need any explanations for further use but is the one that has to be included in the list. The second criteria is dealing with the level of suppliers' and company's plans integration where 100% synchronization means company and its suppliers are sharing plans (for example, by means of electronic communication) and such situation is still very rare. If the level of synchronization is high, a company is usually being able to receive all the resources needed in due course. The third criteria is being estimated as a

simple average of the following particular criteria: (1) equivalence of human resources used to the level planned, (2) equivalence of material and technical and technological resources used to the level planned, (3) equivalence of financial resources used to the level planned, (4) equivalence of sales to the level planned, (5) equivalence of informational resources used to the level planned and (6) equivalence of intangible resources used to the level planned. This is an indirect indicator of plans quality describing plans' contents adequacy to the changes in external and internal environment. Finally, equity to liabilities ratio was chosen as a financial criteria describing the quality of planning function performance by the majority of respondents (90.06%) while correlation analysis proved the possibility to use this one in order to measure the quality of planning function performance.

**Table 1 Planning Quality Estimation Criteria**

Name of criteria	Quality of performance						Correlation to management effectiveness
	Outstanding	Excellent	Good	Average	Poor	Very poor	
Operating plans accuracy	± 0-0.5%	± 0.5-7%	± 7-15%	±15-25%	± 25-35%	> 35%	+86.14%
Level of plans synchronization with suppliers	99-100%	90-99%	75-90%	65-75%	50-65%	≤ 50%	+71.12%
Plans adequateness to the state of environment	99-100%	90-99%	75-90%	65-75%	50-65%	≤ 50%	+87.04%
Equity to liabilities ratio <sup>1</sup>	0.49-0.51	0.4-0.49 or 0.51-0.56	0.35-0.4 or 0.6-0.7	0.7-0.9	0.2-0.35	≤ 0.2 or ≥ 0.9	+72.58%

Ranges of values of the chosen criteria which are featured in the table were as well estimated by means of expert opinions summarization which was carried out according to the Delphi method. Managers and experts were asked to define the range within which they consider planning function performance “outstanding”, “excellent”, “good”, “average”, “poor” or “very poor”. The results were summarized according to the procedure and shown in the table above.

The list of criteria which is suggested to be used in order to estimate the quality of organization is shown in Table 2. It was created according to the same procedure used in case of developing a list of planning function performance quality measuring criteria.

Organizational connection reliability indicator was introduced by A. Smolkin (Smolkin, 1999) together with the method for its quantitative measurement and the we are agreeing with the experts that is one should be used in case of organizational function performance quality estimation. The same applies to the second criteria, level of duplication which was researched thoroughly by A. Prigozhin (Prigozhin, 2007) who had also introduced a clear method for its quantitative estimation.

**Table 2 Organization Quality Estimation Criteria**

Name of criteria	Quality of performance						Correlation to management effectiveness
	Outstanding	Excellent	Good	Average	Poor	Very poor	
Organizational connections reliability	98.5-100%	90-98.5%	75-90%	65-75%	50-65%	≤ 50%	+83.41%
Level of duplication	0-0.5%	0.5-5%	5-12%	12-18%	18-25%	> 25%	-78.51%
Maximum span of control	≥ 30	14-30	8-13	5-7	3-4	< 3	+83.94%
Cells of management fulfillment	99-100%	95-99%	85-94.9%	75-84.9%	60-74.9%	< 60%	+70.19%
Managerial costs share in total costs	< 1%	1-7%	7-12%	12-20%	20-30%	> 30%	-94.72%

<sup>1</sup> These ranges of values were figured for machinery building enterprise and would be different for other spheres.

As for the third criteria, the span of control, we suggest a different from traditional approach towards its estimation. Usually span of control is being estimated as some constant value individual for each organization; we would like to emphasize that span of control (SC) is a variable defined by two factors: organization’s specific characteristics ( $k_{ind}$ ) and the amount of separate managerial units regulating single operation ( $k_{imou}$ ). Henceforth maximum span of control which is the third criteria featured in Table 2 can be estimated in the following way:

$$SC_{max} = k_{ind} * k_{imou} \quad (1)$$

In the given formula both coefficients are to be defined for each organization. First,  $k_{ind}$  is defined by adding to the amount of two (two is a minimum span of control acceptable within an organization) correction coefficients (+1, 0 or -1) which are featured clearly in Table 3 below:

$$k_{ind} = 2 + \sum_{i=1}^7 k_{cvi} \quad (2)$$

Where  $k_{cvi}$  is the correction value of each individual factor influencing the span of control, featured in Table 3;  $i$  (1÷7)—serial number of an individual factor (the number of factors was chosen in order to keep the total in suggested range of  $7 \pm 2$  (Miller, 1956).

**Table 3 Correction Coefficients for Kind Valuation**

Name of the factor	Value of $k_{cv}$		
	-1	0	+1
Psychological type of the manager	Despotic	Authoritarian	Democratic
Formal and informal leadership coincidence	In most cases there is no coincidence	Coincidence occurs roughly in 50% of the cases	In most cases there is coincidence
Attitude towards authority delivery	Negative, the process of decision-making is highly centralized	Authority can be delivered for decisions of minor importance	Decisions are mainly made at the level of their future implementation
Level of understanding of correlation between employees’ and organization’s results	Employees rarely see correlation between their own results and organization’s performance	Employees consider some successes and failures of organization as their own	Employees consider almost all of company’s successes and failures as their own
The level of external environment predictability	Very high level of unpredictability (introduction of a totally new product to the market)	High level of unpredictability (introduction of modified products to the market)	Relatively low level of unpredictability (not considering the cases of force majeure)
The level of disturbance in organizational communications	Irrelevant information occupies 60-100% of total information within organization	Irrelevant information occupies 30-60% of total information within organization	Irrelevant information occupies less than 30% of total information within organization
The level of correspondence between types of jobs and types of employees personalities <sup>2</sup>	The type of job is rarely corresponding to employee’s personality	The type of job is corresponding to employee’s personality occasionally	The type of job is corresponding to employee’s personality in most of the cases

As it can be seen from the above, maximum value of  $k_{ind}$  coefficient is 9 while the minimum value is -5; in case this coefficient is lower than +2, organizational function should be considered misperformed. The second coefficient used in the formula (1) is estimated according to the type of organizational structure. In case of classical bureaucracies it is equal to 1 because in this case there should be only one manager responsible for certain operation performance. In case of matrix organizational structure there are two managers that can be independently dealing with one operation which means in that case  $k_{imou}$  is equal to 2; in case of virtual, network,

<sup>2</sup> according to Holland’s classification

module or other contemporary flat organizational structure this coefficient can be greater than 2 which allows getting span of control much higher. Maximum span of control criteria should not be used by itself; it is also relevant to see the fulfillment of managerial cells (100% fulfillment means every manager is in charge of maximum amount of people possible). Finally the financial criteria describing the quality of organizational function performance according to correlation analysis is management costs share in total costs of the enterprise. As it had been mentioned for planning function, the ranges shown in Table 2 are the results of expert opinion processing according to Delphi method.

**Table 4 Control Quality Estimation Criteria**

Name of criteria	Quality of performance						Correlation to management effectiveness
	Outstanding	Excellent	Good	Average	Poor	Very poor	
Structure of deflections	0.97-1.0/ 0-0.05/ 0-0.01	0.7-0.97/ 0.05-0.2/ 0.01-0.1	0.6-0.7/ 0.05-0.3/ 0.01-0.2	0.4-0.6/ 0.2-0.3/ 0.1-0.3	0.3-0.4/ 0.2-0.4/ 0.3-0.7	0-0.3/ 0.3-0.7/ 0.3-0.7	+72.81%
Dynamics of indicators used for control	0-0.5%	0.5-5%	5-7%	7-12%	12-20%	> 20%	+80.76%
Share of non-formalized indicators used for control	0-0.5%	0.5-3%	3-5%	5-8%	8-15%	> 15%	+88.21%
Level of internal transparency	See Table 5 for explanations						+92.65%
Indirect to direct costs ratio	< 5%	5-25%	25-50%	50-80%	80-150%	> 150%	-77.14%

The list of criteria which is suggested to be used in order to estimate the quality of control is shown in Table 4. It was created according to the same procedure used in case of developing a list of planning function performance quality measuring criteria.

The first indicator presented within the table is a complex one and consists of three sub-indicators: the share of deflections revealed at the stage of preliminary control ( $S_{pc}$ ), the share of deflections found at the level of current control ( $S_{cc}$ ) and the share of deflections found at the stage of closing control or as a result of feedback procedures ( $S_{cfc}$ ). In the Table 4 the level of this certain criteria is shown in the format  $S_{pc}/S_{cc}/S_{cfc}$ . In order to figure out correlation the highest point was given to the situation when maximum deflections were revealed on the stage of preliminary control. The second indicator featured in the table is the main characteristic of control system stability, which means the higher percentage there is, the more indicators used within the process of control, management is changing annually. When this list is being changed rapidly company management is unable to do comparative analysis and is in fact confusing personnel. Both of those factors lead to worse performance of the enterprise. The same logic can be used for the third indicator, the share of non-formalized indicators. If this share is high, the results of control tend to become subjective which causes decrease in control effectiveness (the result is management system malfunctioning which is proved by high correlation coefficient). The fourth criteria describing control function performance is a level of internal transparency which quite a few Russian enterprises lack. This indicator is the one that is difficult to measure directly, so we are suggesting to estimate it as a three-factor integrated coefficient. The suggested approach towards estimation of the internal transparency level is shown in Table 5.

As it can be seen from Table 5 the level of internal transparency is estimated on the basis of three characteristics which are implicitly describing the level of trust and cross-checking within the company. Those characteristics were named by majority of respondents when they were offered the list of internal transparency indicators within the second round of questioning produced for the needs of this research. The last indicator of control performance quality (indirect to direct costs ratio) was also named by majority of respondents. The idea

behind choosing this particular index is that high level of indirect costs points out that a big amount of money company spends does not have a clear basis which means they are hard to be controlled.

**Table 5 Level of Internal Transparency Estimation**

Quality of performance	Non-productive costs to productive costs ratio	Fulfillment of management cell (%) before new cells are created	The amount of cross-checking performed for the needs of one process
Outstanding	< 5%	Full	0
Excellent	5-30%	95-100%	0
Good	30-60%	90-95%	1
Average	60-90%	80-90%	2
Poor	90-110%	60-80%	3-4
Very poor	> 110%	< 60%	> 4

The list of criteria which is suggested to be used in order to estimate the quality of coordination which was created by the same procedure, is shown in Table 6.

**Table 6 Coordination Quality Estimation Criteria**

Name of criteria	Quality of performance						Correlation to management effectiveness
	Outstanding	Excellent	Good	Average	Poor	Very poor	
Amount of consecutive adjustments in a process	0-0.5	0.5-2	2-3	3-5	5-7	> 7	-83.06%
System reaction towards changes	Completely adequate	Adequate	A little ex-aggerated or under-estimated	Inadequate, exaggerated	Inadequate, underestimated	No reaction	+82.15%
Current assets to current liabilities ratio	-	1.4-1.8	1.0-1.4	1.8-2.0	0.95-1.0 or 2.0-2.5	< 0.95 or > 2.5	+71.02%

Estimation of the first suggested criteria is to be carried out on the basis of sampling process. In this case the one testing amount of consecutive adjustments in a process has to make sure he is testing main, auxiliary and management process. The simple average estimated in the end is the basis for valuation of coordination function performance quality. The second criteria featured in the Table 6 is (as it can be seen) a non-formalized one. In order to value it one has to carry out some kind of expert opinion valuation. Though this criterion can not be defined distinctly, it was put on the list of indicators for coordination quality valuation by 92.8% of the respondents and being tested by linear correlation analysis had shown quite high level of relevance. Both those reasons led to the fact that this criterion was included into the list. Finally the ratio of current assets to current liabilities was considered as financial indicator of coordination function performance quality because this one is an index describing enterprise's short-term financial responsibility. Henceforth it is the one that can be brought back to the desired level in a short period of time (less than one year) in case management system is showing adequate reaction towards the changes in internal and external environment. The specific values presented in the Table 6 are the ones suitable for Russian heavy machinery building enterprises<sup>3</sup> and are to be changed for other companies from the real sector of the economy. The suggested ranges are put into the table in order to show the main approach towards valuation of the third suggested coefficient used for coordination function performance quality estimation.

<sup>3</sup> Those ranges for current assets to current liabilities ratio are based upon the data of 25 Russian heavy machinery building companies, and it has to be emphasized that this criteria is highly variable according to the field where a certain company is acting.

The list of criteria which is suggested for use in order to estimate the quality of motivation function is shown in Table 7. The procedure for making the list itself (Svirina, 2009) and estimating the ranges describing certain quality of motivation on the basis of suggested criteria is being the same as was used for planning, organization, control and coordination functions.

**Table 7 Motivation Quality Estimation Criteria**

Name of criteria	Quality of performance						Correlation to management effectiveness
	Outstanding	Excellent	Good	Average	Poor	Very poor	
Level of employee satisfaction <sup>4</sup>	98-100% satisfied	Over 70% employees satisfied	50% employees satisfied, 50% are not satisfied	Over 70% employees are not satisfied	Over 70% employees are not dissatisfied	Over 50% employees dissatisfied	+74.57%
Level of job and employee's motivation profile coincidence	99.5%-100%	93-99.5%	85%-93%	75%-85%	60%-75%	< 60%	+72.23%
Level of stimulation adequacy	See Table 8 for explanation						+92.74%
Level of motivation profile and stimulation deflection	± 1% and less	± 1-10%	± 10-15%	± 15-25%	± 25-50%	± 50% and more	-87.62%
Level of employee creativity (employee innovative suggestions implemented)	98-100%	80-98%	60-80%	30-60%	10-30%	< 10%	+86.90%
Labor productivity (thousand rub-les per person annually)	> 2500	700-2500	550-700	400-550	200-400	< 200	+90.26%

At first it is worth mentioning that estimation of motivation function performance quality proposes demand for non-formalized criteria use. At the same time within the survey we have stated as one of our goals to keep the amount of those as low as possible. The first criteria, featured in the table concerns employee satisfaction in terms of Herzberg motivation theory which implies 4 states of employee's satisfaction level. This can be measured by means of questionnaire and correlation index of this criterion is high enough. Estimation of the next three criteria (level of job and employee's motivation profile coincidence, level of stimulation adequacy and level of deflection between motivation profile and stimulation implemented) requires introduction of methodical approach developed for coincidental measurement. The suggested approach is based upon Gerchikov motivation theory (Gerchikov, 2003) which implies there are five main motivation types (instrumental, professional, owner, patriotic and escaping). Each of those motivation types is requiring special stimulation and is suitable for certain jobs which is also featured in Gerchikov's published work together with the questionnaire for employee's motivation profile estimation. The profile means that Gerchikov was taking into account that almost all of the employees have qualities that are characterizing them as a representative of different motivation types (an example for two employees is shown on Figure 2) which is presented on a five-scale diagram.

For the needs of this research we were assuming that job and motivation profile coincidence as well as the level of deflection between motivation profile and stimulation implemented are to be defined according to the basic motivation of employees.

<sup>4</sup> In terms of Herzberg theory.

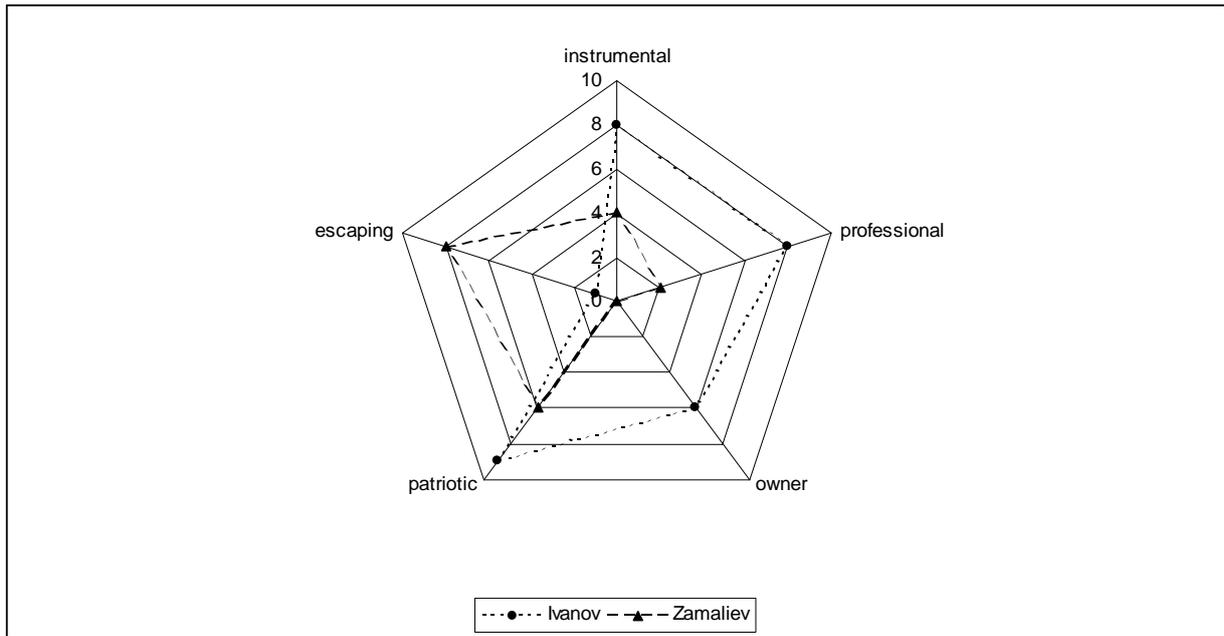


Figure 2 An Example of Employee Motivation Profile

Percentages presented in Table 7 are given assuming that 100% is total amount of company employees. The level of stimulation adequacy is a non-formalized criteria and its ranges are featured in Table 8.

Table 8 Level of Stimulation Adequacy

The level of motivation profile and stimulating measures deflection	Quality of motivation function performance
Statistically insignificant deflection level	Outstanding
Almost no deflection	Excellent
Low deflection, even for all 5 scales	Good
Significant deflection on 1 scale	Average
Significant deflection on 2 or 3 scales	Poor
Significant deflection on 4 or 5 scales	Very poor

This particular criterion remains non-formalized due to the fact it that expert opinions on percentage ratios representing significance and insignificance were showing high level of unconformity and it was decided it would be better to leave estimation of significance to experts dealing with certain companies. It can be explained by the fact that sometimes inadequate stimulation of a few people can be significant in case they are the ones making decisions so it seems admissible to leave this criterion as a non-formalized one.

The fifth criterion is a formalized one and is used for valuation of employee creativity level. It is also assumed that company personnel is being creative in case people are motivated and according to Japanese experience company efficiency is rising in case employees are interested in constant improvement. The sixth criterion is again a financial one suggested by the majority of respondents as well as previous researches. The ranges given in Table 7 are the ones estimated for Russian machinery building enterprise and are to be changed in case of other country or sphere of activity.

The next management system function which is performed by contemporary enterprise’s management, featured in this research, is creation and development of organizational culture as an informal way of management.

The list of criteria which is suggested for use in order to estimate the quality of organizational culture creation and development function is shown in Table 9. The procedure for making the list itself and estimating the ranges is the same as was used earlier within this research.

**Table 9 Creation and Development of Organizational Culture Quality Estimation Criteria**

Name of criteria	Quality of performance						Correlation to management effectiveness
	Outstanding	Excellent	Good	Average	Poor	Very poor	
Amount of employees and company's matching values	10	9	6-8	3-5	2	< 2	+77.42%
Level of cultural entropy	< 1%	1-6%	6-10%	10-15%	15-30%	> 30%	-72.34%
Value leverage level	< 1%	1-10%	10-25%	25-50%	50-70%	> 70%	-81.14%
Synergetic effect	Resources efficiency increases 10 times or more	Resources efficiency increases 2.5 to 10 times	Resources efficiency increases 1.5 to 2.5 times	Resources efficiency increases 1.01 to 1.5 times	No synergetic effect	Negative synergetic effect	+84.21%
Net profit to income ratio	> 40%	12-40%	7-12%	3-7%	0-3%	< 0%	+86.71

First two criteria featured in Table 9 were introduced by R. Barrett (Barrett, 1997) who also features the methodology for their estimation within his concept of cultural transformation tools concept. For the needs of organizational culture quality estimation this methodology is highly suitable since it allows measurer to get concrete figures describing the quality. At the same time those two criteria are not allowing to estimate the relation between company performance and the level of organizational culture development. Such a criterion was developed for the purpose of this research and was named value leverage (to show its analogy with operational leverage) and shows by what share would company profits increase (decrease) in case the amount of employees sharing values of the company increase by 1%:

$$VL = \frac{\sum_{i=1}^n \frac{\Delta P_{sal}}{\Delta A_{evs}}}{n} * 100\% \quad (3)$$

Where VL—value leverage, %;

i—the number of periods analyzed;

$\Delta P_{sal}$ —variation of profit received from the main activity of an enterprise (gross profit deducted by commercial and managerial costs);

$\Delta A_{evs}$ —variation of the number of employees sharing company values (and satisfied).

Another criterion suggested for estimation of organizational culture creation and development quality is the level of synergetic effect produced by the company since this indicator shows how formal and informal structures are collaborating. This particular criteria is again the one which can not be formalized and has to be estimated with the help of experts, but the ranges suggested in Table 9 by the respondents are showing a measuring aspect which can not be estimated accurately but can be usually put within a certain range. Finally financial criteria chosen by the respondents (net profit to income ratio) is also measuring the efficiency of formal and informal structures collaboration indirectly. As it was mentioned for coordination and motivation functions the ranges of net profit to income ratio were estimated for the case of Russian machinery building enterprises and are to be changed for other spheres of economic activity.

The last basic general function of management, featured in this research, is development of corporate social responsibility which is representing the company collaboration with society, customers and suppliers in terms of mutual trust mostly.

The list of criteria which is suggested for use in order to estimate the quality of corporate social responsibility development function is shown in Table 10. The procedure for making the list itself and estimating the ranges is the same as was used earlier within this research.

**Table 10 Development of Corporate Social Responsibility Quality Estimation Criteria**

Name of criteria	Quality of performance						Correlation to management effectiveness
	Outstanding	Excellent	Good	Average	Poor	Very poor	
Rejection rate of goods and services	0-0.5%	0.5-4%	4-7%	7-15%	15-25%	> 25%	-82.12%
Share of corruption-based costs in total costs	< 1%	1-7%	7-15%	15-20%	20-40%	> 40%	-76.84%
Share of labor contract violation in total interactions with employees	0-0.1%	0.1-1%	2-4%	4-7%	7-10%	> 10%	-71.06%
The share of reclamations processed properly	> 99.7%	98-99.7%	90-98%	80-90%	60-80%	< 60%	+79.84%
Share of deals done on terms prepayment	< 0.5%	0.5-10%	10-25%	25-40%	40-70%	> 70%	-91.73%

It is worth mentioning that for the needs of this research we were assuming that in case of Russian where corporate social responsibility is rarely present the contents of this term are a little different from the one used in Western literature (for example, Goyder, 1961; Henriques, 2003). In case of Russia a company can be addressed as socially responsible in case it is fulfilling its liabilities before employees, customers, suppliers and society since legal legislation acts and the state of judicial authority allows enterprises to ignore or override written law frequently (which is hopefully not the case for Western economies). This reasoning was behind the choice of criteria made by majority of our respondents which is featured in Table 10. The first criterion chosen is rejection rate which represents company's responsibility before customers. The ranges shown in the table were figured for Russian regional production enterprises where 20% rejection rate is a common case. The second criteria (share of corruption-based costs) ranges were estimated by respondents who were assuming that 10% rate is maximum level of unavoidable corruption-based costs (which occur in case legislation acts are stated in a way when it is impossible to present entrepreneurial activity without breaking any of them). So 10% is considered to be some kind of corruption "background emanation" (it differs for different types of entrepreneurial activity, but the average figure seems quite correct). Violations of employees labor contracts are also quite common which is the reason for the choice of third criteria from the table. Same reasoning is behind the choice of criteria characterizing the level of properly processed reclamations. Judicial practice present today allows enterprises to leave quite a few reclamations even unanswered which makes it sort of a good will gesture to deal with reclamations according to proper procedure (in a few spheres there are no regulations of that procedure). Finally the financial criteria chosen by respondents (share of deals done on terms prepayment) is the one characterizing the level of trust an enterprise have with its partners which shows high correlation with management effectiveness.

As it can be seen from the described approach towards estimation of management functions performance quality is a process which involves valuation of a number of coefficients and seems to give a distinct picture of company management quality. The next step taken in this research is to define results produced by the system of management in relation to its quality.

#### 4. Management System Results Measurement

As it was mentioned earlier one of the problems with management results estimation is that it is unequal to enterprise's results though the quality of management performance affects the last greatly. Next, for quantitative management only monetary units can be used which leads us to the problem of measuring results produced by the system of management in monetary terms.

In order to solve those problems one has to consider the following things. First of all, the result produced by management system is a part of company result, and we can assume, that the higher the quality of management function performance is the higher is the role of management system in achievement of company results. On the opposite the lower quality of management is the lower is the impact of this system on company's results (in this case system of management is often affecting the company results negatively, and if company is keeping to achieve positive results it is usually due to the fact employees are in fact ignoring instructions given by management). At the same time one can not consider company's management activity efficient if the enterprise is getting negative financial result—even in case overall quality of management function performance is relatively high (such a situation can occur in case of country club management (Blake, Mouton, 1964).

Taking into consideration those two problems, we have developed the following method of management system result estimation. First of all the types of management systems are divided into 6 types:

0 class—highly efficient management system producing positive synergetic effect;

1 class—efficient management system which is performing all seven management functions with excellence;

2 class—enterprises with good management system which is performing basic general management functions efficiently with a little misbalance;

3 class—capable management system which can be improved in terms of management functions quality increase;

4 class—misbalanced and in many cases incapable system of management;

5 class—malfunctioning management system, if an enterprises keeps functioning it is due to external reasons or the result of informal management system performance.

Estimation of management system quality is supposed to be carried out according to the following procedure:

$$QP = \sum_{i=1}^{33} c_i \quad (4)$$

Where QP is the amount of points characterizing the quality of management system;

i—criteria, characterizing the quality of basic general management functions performance, described above (total amount of those is 33);

c—points, received by enterprise's management system for each individual criteria (where "outstanding" means by this criteria management system should be graded by 8 points, "excellent"—by 5 points, "good"—4 points, "average"—3 points, "poor"—2 points and "very poor"—1 point).

Henceforth maximum points a regular management system can receive is 165 (33\*5) points. This level would be considered a maximum regular level (outstanding management performance should be graded higher) for the needs of management results estimation.

In case an enterprise has losses, the quality of management system within its valuation has to be decreased. The level of decrease needed was estimated on the basis of expert opinions who considered the following. In case an enterprise is having losses on the level of gross profit the quality of management has to be decreased by 3

classes (which means 4th class becomes maximum quality level of management system). In terms of points it means 60 points should be subtracted from the sum estimated according to the formula (4). It also has to be mentioned that gross losses have to be seen at least two periods in a row in order to exclude the situation when company management did not have time to react to force majeure. Same is true in case company has losses at the level of EBIT—in order to make a correction of management quality level in this case class of management should be decreased by two classes, which means 40 points should be subtracted from the sum estimated according to the formula (4). Finally, in case of net losses they should occur three periods in a row, and in this case the quality of management system should be decreased by one class by subtracting 20 points from the sum of individual characteristics (estimated by formula (4)).

The points received become the basement for estimation of management system quality class. In case management system receive over 165 points it can be rated as class 0; if it receives from 146 to 165 points—class 1; from 136 to 145 points—class 2; from 106 to 125 points—class 3; from 81 to 105—class 4 and less than 81 point—class 5. Those ranges were estimated within the process of expert's opinion valuation carried out according to Delphi method.

Finally, the comparative ratio of points received by system of management and maximum regular points becomes the correction coefficient which shows which part of company result can be considered the one achieved due to management system functioning:

$$Ef_{man} = Pr * \frac{P_{fact}}{P_{max}} \quad (5)$$

Where  $Ef_{man}$ —effect (in monetary terms), produced by the system of management;

$Pr$ —profits earned by the enterprise (the type of profit used in this formula can be chosen in each case according to the type of analysis carried), monetary units;

$P_{fact}$ —points earned by particular management system;

$P_{max}$ —maximum quality points received by regular management system, 165 points.

This procedure allows to measure monetary value of results produced by the system of management. Within the suggested procedure two main problems of management system efficiency estimation problems are solved. First, the procedure allows to clear out the result produced by formal management while subtracting the part of result which is achieved by the company due to internal or external changes or due to efficient performance of informal management and communication systems. Second, the suggested procedure allows one to value effect produced by system of management in monetary terms which is essential for performing different types of comparative analysis.

## **5. Evident and Failure Managerial Costs Measurement**

According to hypotheses 3 stated in this paper, in order to estimate management system efficiency one has to develop a tool for measuring both evident and hidden management costs. According to most of the authors managerial costs are considered to be direct costs arising due to activity of management system (for example, Bakaev, 2010) which are included into cost price. Those costs include manager's salary and salary-based payments, materials, amortization and other costs which occur due to development and performance of the system of management. But those costs are only a part of expenses an enterprise has due to management system activity. In case there had been a mistake made by management, an enterprise has to carry additional expenses in order to

smooth down the consequences of this mistake. Coincidental costs would include not only evident managerial, but as well regular costs the enterprise usually has: personnel salary and related payment, raw materials, transportation etc., but in case there was no mistake made by management, those costs would never occur. This allows us to consider those costs as a result of management system functioning—as hidden managerial costs. There also is no doubt that low quality management systems tend to produce more hidden costs than high quality ones.

This situation requires a tool for estimation of hidden costs. There is a resembling problem in quality management when one wants to estimate total costs of rejection, and it is suggested by some authors (Harry, Shreder, 2003). Since managerial mistakes usually lead to non-eliminable consequences total managerial costs (including the ones arising due to managerial mistakes made) can be estimated in the following way:

$$C_{man\ t} = C_{man} * \frac{1}{1 - E_{man}} \quad (6)$$

Where  $C_{man\ t}$ —total managerial costs in their regular meaning, including those that arise as a result of management mistakes within management system, monetary units;

$C_{man}$ —evident costs which are the result of management system activity, monetary units;

$E_{man}$ —level of management entropy (level of management malfunctioning), share (0÷1).

The next problem arising is quantitative measuring of managerial entropy. Managerial entropy characterizes on the one hand the share of resources (labor, financial, temporal etc.) which are spent due to the fact that managers do not have algorithms and instructions for solutions of the problems that occur regularly. On the other hand this level represents additional costs that enterprise has to have due to mistakes made by its managers or occurring as the result of management system malfunctioning. The level of managerial entropy is more difficult to estimate than rejection rate (which is used in case of quality management) since one can not use methods of technical control which can be used in products quality management. Henceforth we suggest the following procedure for managerial entropy estimation. On the first stage it includes expert valuation of resources losses level which is the result of the fact that a company has additional demand in managerial regulation of typical processes, together with expert valuation of the waste level of extra resources which is due to management system malfunctioning (the reason of malfunctioning in this case does not matter). On the second stage a control procedure should be performed. At first the information which is formalized and arranged on the top-management level (in the form of orders, oral explanations, instructions etc.) is compared same documents as they are understood by executor. In order to make this comparison executor is asked to write down his interpretation of the document and than those two documents are compared. Next, the amount of corrections performed by enterprise's management in order to receive the desired result can be estimated which also an indirect indicator of management is malfunctioning level. On the basis of those procedures an average level of managerial entropy should be estimated and used in formula (6) for measuring of evident and hidden direct costs of management system functioning.

At the same time management system malfunctioning is leading as well to extra costs in production, commercial activity and so on (in fact those are the ones that would not have happened if management did not make mistakes). Those extra costs can be measured in the following way:

$$C_{tot\ man} = \sum_{i=1}^n C_i * \frac{1}{1 - E_{man}} - \sum_{i=1}^n C_i \quad (7)$$

Where  $C_{tot\ man}$ —enterprise's extra costs (excluding direct managerial) arising as the result of management system malfunctioning, monetary units;

$i (1 \div n)$ —types of resources consumed by the enterprise;

$C$ —expenses occurring within entrepreneurial activity of the enterprise due to use of certain resource, monetary units.

The second item in the formula (7) is added in order to exclude direct costs of enterprises' production and commercial activity. Henceforth total costs produced by management system (evident and hidden) can be estimated in the following way:

$$C_{man} = C_{man t} + C_{tot man} \quad (8)$$

This means that growth of management based costs of an enterprise has a non-linear trend depending on the level of managerial entropy (see Figure 3).

As it can be seen from the Figure (the example given there assumes direct evident managerial costs are equal 100 monetary units, enterprise is using only one resource for production and it costs 400 monetary units during the period) even at the 0.1 level of managerial entropy management based costs increase 1.56 times in comparison to the situation of zero entropy level.

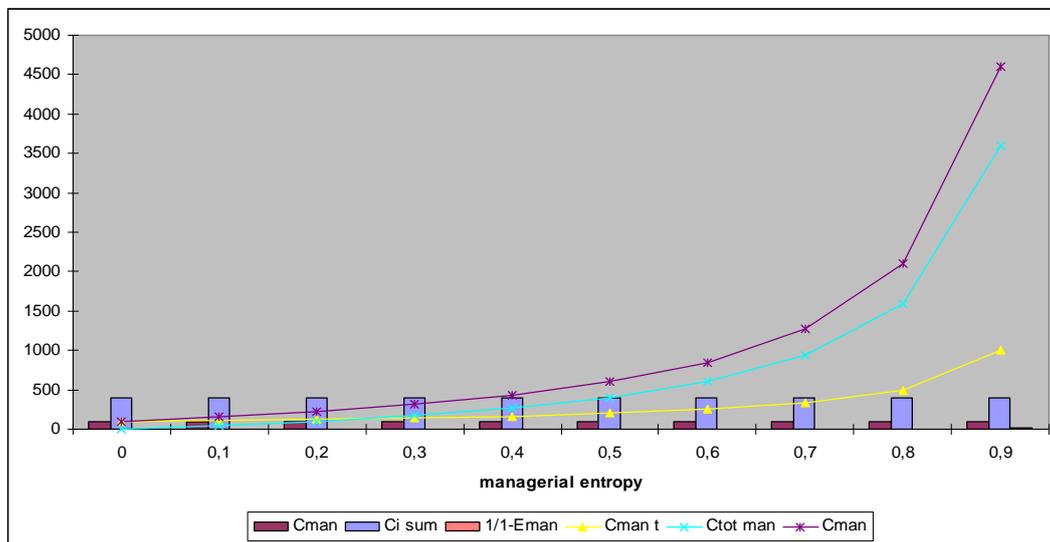


Figure 3 Total Management Based Costs in Dependence of Managerial Entropy Level

In case managerial entropy level comes to 0.4 management based costs exceed production costs. If entropy comes to the level 0.8 management based costs are 21 times higher than in case entropy is equal to 0. This emphasizes that idea to assume the costs which occur in production due to management system malfunctioning as production costs lead to huge underestimation of true expenses of management, especially malfunctioning management.

## 6. Management System Performance Efficiency Measurement

According to the classical definition of efficiency (Emerson, 1909) it should represent some kind of correlation between results produced by management system and management based costs. An approach towards definition of both had been presented above in this paper. Henceforth quantitative estimation of management system efficiency can be carried out in the following way:

$$MEff = f(Ef_{man}, C_{man}) \quad (9)$$

Meanwhile, if the effect of management system performance was measured on the basis of gross profit (as it was suggested earlier in the paper, one can choose type of profit used for managerial result estimation), the estimated efficiency should be addressed as the efficiency of main production management; if the effect was estimated on the basis of earnings before interest and taxes, coincidental efficiency can be addressed as efficiency of production and investment management; finally, in case net profit was used the coincidental efficiency can be addressed as general efficiency of management system performance. This last efficiency is considered the most relevant one, which gives the best characteristics of management efficiency.

It also has to be mentioned that management system performance efficiency can be estimated as a simple ratio of managerial effect (result) and costs (which is the simple relative efficiency coefficient). In this case one should perform some additional operations in order to get an interpretable result. At first maximum efficiency for certain enterprise should be estimated. According to procedure featured in this paper maximum management result ( $Ef_{man\ max}$ ) is equal to profit earned by the company (that would happen in case management system is of excellent quality and receive 165 points). Then, minimum management based costs ( $C_{man\ min}$ ) occur in case managerial entropy is equal to zero and those costs are equal to those in the meaning from accounting point of view. Than maximum management efficiency of a certain enterprise ( $Meff_{max}$ ) would be a ratio of maximum management results possible for certain enterprise to minimum management based costs:

$$Meff_{max} = \frac{Ef_{man\ max}}{C_{man\ min}} \quad (10)$$

Than management efficiency estimated according to procedure suggested in the paper should be compared to maximum efficiency:

$$RMeff = \frac{Meff_{fact}}{Meff_{max}} * 100\% \quad (11)$$

Where RMeff is relative coefficient characterizing the level of management efficiency, %;

$Meff_{fact}$ —efficiency of management system, estimated according to the procedure featured in this paper, share.

If RMeff is close to 0 management system is highly inefficient, if it comes up to 1—management system is efficient. Some results of practical analysis of management efficiency in case of some Russian enterprises are presented in Table 11.

**Table 11 An Example of Management Efficiency Estimation**

Indicator	Zelenodolsk plant named after A. M. Gorky	Chistopol watch-building plant “Vostok”	Kazan helicopter building plant
Net profit, roubles	1 378 000	852 000	1 541 561 000
Management results, roubles	886 261	402 764	943 622 187
Management costs, roubles	90 092 000	13 211 000	2 612 620 200
Corrected management based costs, roubles	123 727 480	32 880 047	2 875 508 140
Management efficiency	0.0071	0.0122	0.3281
Maximum management efficiency <sup>5</sup>	0.0133	0.0645	0.5900
Relative management efficiency	53.38%	18.91%	55.61%

<sup>5</sup> It is also worth mentioning that quite a few authors assume this is managerial efficiency. One can see from the Table that such approach leads to great underestimation of true role of management in enterprise’s performance in the market.

The analysis of these three companies performance after management efficiency was estimated as featured in Table 11 had shown that Kazan helicopter building plant is increasing profits with a higher pace than Zelenodolsk plant, while “Vostok” plant went bankrupt in 1.5 years time after the above shown analysis was carried out.

In some cases more complicated indicators of managerial efficiency can be used, for example, and analog of net present value (concerning management effect and costs only) or modified for management system efficiency estimation needs internal rate of return, which can be estimated as follows:

$$\sum_{i=1}^n \frac{Ef_{mani}}{(1 + IRR_{man})^i} - \sum_{i=1}^n C_{mani} = 0 \quad (12)$$

Where  $IRR_{man}$  is a IRR-based management system efficiency valuating coefficient;

$i$  ( $1 \div n$ )—number of the periods taken into consideration for analysis.

The choice of a certain efficiency coefficient depends on the type of analysis carried and expected results of this analysis.

## 7. Conclusions

Three hypotheses were stated within the presented paper. In order to prove major hypotheses, stating that efficiency of management system performance can be measured, two minor hypotheses were tested. It was estimated that results produced by the system of management can be estimated by means of correcting company profits by the coefficient which characterizes the quality of management system performance. In order to create this coefficient a special framework based upon closed list of basic general management functions was developed—this was created in order to prove the second hypotheses. It was also estimated that management based costs include both evident managerial costs and hidden costs. The hidden costs can be estimated on the basic of measuring the level of managerial entropy, a concept introduced in this paper. This approach was developed within the proving of third hypotheses. On the basis of estimated effect and costs produced by the system of enterprise’s management the efficiency of management system can be figured out which is the proof of major hypotheses. An example presented in the end of the paper proves that suggested method is providing a better understanding of real management system efficiency than traditional ones.

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