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IMPACT OF THE IMPLEMENTATION OF QUALITY MANAGEMENT SYSTEM ON OPERATING COST FOR SMALL AND MEDIUM-SIZED BUSINESS ORGANIZATIONS AFFILIATED TO A PURCHASING GROUP

Abstract: *Purpose – The purpose of this paper is to ask one question. How the implementation of the requirements of ISO 9001 system affects the costs of running the business?*

Design/methodology/approach – The research covered time from 2006 to 2011 and was an attempt to assess the impact of the maintenance of the ISO 9001 Quality Management System on the costs of small and medium sized business organizations. The main objective was the selection of right research subjects that would allow the formulation of the most reliable and statistically valid conclusions. For this purpose we obtained permissions to conduct research in organizations characterized by comparable futures such as size, industry, type of business and strategy.

Findings – The study shows that the costs associated with the implementation and maintenance of the Quality Management System standard is still too high, and effectively discourages representatives of small and medium-sized commercial organizations from implementing ISO 9001 system.

Keywords: *ISO 9001, quality management, cost*

1. Introduction

From a global perspective, the successful spread of ISO 9000 standards seems to be related to the very dynamics of the globalization process in western countries (Heras-Saizarbitoria *et al.*, 2011) Today, globalization, the advancement of technology, shortening product cycles, increasingly sophisticated consumers, and increasing labour costs and volatility in input

prices have created an environment where manufacturers must be flexible, adaptive, responsive, and innovative (Su *et al.*, 2009).

Standardized Quality Management Systems (previously associated mainly with large industrial companies) are now increasingly being implemented in small and medium-sized organizations. This is due to the fact that the Quality Management System according to ISO 9001 standards, especially for small organizations can be an important tool to show to customers that they have the ability to produce products or provide services consistent with their requirements.

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ISO 9001 specifies requirements for a quality management system which can be used by organizations for internal application, certification or contractual purposes. This norm focuses on the effectiveness of the quality management system. ISO 9001 is the normative reference based on which, the quality system certifications of organizations are made (Salgado *et al.*, 2014).

However, we should be aware, that the implementation and certification of the Quality Management System is an investment. The cost incurred during system's implementation, operation and improvement phases can be a significant burden on small and medium-sized commercial organizations, often beyond their financial capacity (Malindžák and Zimon, 2014). It is believed that this is due to the fact, that ISO 9001 requirements do not fully take into account among the other things, the following barriers faced by a small and medium size firms:

- Flat, single-level organizational structure
- Inadequate value of equity limiting company's ability to self-finance or borrow funds for development projects
- Unfavorable treatment by financial institutions
- Limited ability to attract right mix of personnel

Those difficulties lead to the formation of a following, fundamental question: *How the implementation of the requirements of ISO 9001 system affects the costs of running the business?*

To answer to this important question we designed and then carried out a comprehensive research. The research covered time from 2006 to 2011 and was an attempt to assess the impact of the maintenance of the ISO 9001 Quality Management System on the costs of small and medium sized business organizations. The main objective was the selection of right

research subjects that would allow the formulation of the most reliable and statistically valid conclusions. For this purpose we obtained permissions to conduct research in organizations characterized by comparable futures such as size, industry, type of business, strategy and management experience. The result of the selection and approval process was a group of twenty two companies representing one purchasing group. The final decision, whether to include those companies in our study, was made primary on the fact that they all met the following pre-established conditions:

- Each company represents small or medium-sized commercial organization
- They reflect general tendency, as some of them already implemented a Quality Management System standard, while others are either in the process of implementing or not planning to take that step at all
- Within the group, each of the member organization follows a joint business strategy and operates under very similar conditions, so the cost impact of implementation of ISO 9001 system on their overall performances could be compared and statistically evaluated

2. Impact of quality management system operating cost on the organization - own research

Cost of quality due to their complexity, have not been up to now clearly classified and defined. According to Yang the concept of quality costs has been in place for nearly five decades, but the uncertainty regarding its use still continues (Yang, 2008). It needs to be pointed out that to implement an effective cost of quality system, the categorization and definition of quality elements should be very clear from the beginning (Weinstein *et al.*, 2009).

Authors often consider the cost of quality as a costs incurred by the company in the manufacture of products. Concepts of quality

costs in this area relate most to the classification proposed by Juran and Gryn, according to which the quality costs are those costs of the company, which are incurred for the product shelf life, and they also include costs incurred during and outside the production process and the costs of poor quality. In addition, Juran proposes two main groups of the so-called costs (Juran, 1989):

- The cost of "good quality", which may include all expenses to ensure in the future the production of products which are characterized by excellent quality and,
- "poor quality costs" which are the cost of all the errors and mistakes, and improper use of resources that can be avoided by increasing the investment in the first group of costs. During the management review an organization should monitor (Larson and Kerr, 2007) the quality objectives, and report as well as evaluate the cost of poor quality regularly. This is an essential part of the continual improvement process.

Similar views on this subject has (Bank, 1996), which recognizes the kind of quality costs for a reduced model of all costs incurred in the production of high-quality product or service, which includes the cost of prevention, cost estimating, cost of internal errors, the costs associated with exceeding customer requirements, as well as costs resulting from lost profits. With these considerations (Sukhija, 2009), agrees that in the overall quality costs include the costs of eliminating errors and defects, plus the cost of errors that were not detected and corrected. Tye *et al.* (2011) postulates that quality costs as the difference between the actual cost of a product or service and what the reduced cost would be if there was no possibility of substandard service, failure of products or defects in their manufacturing. Moreover, Feigenbaum (1991) defines:

- prevention costs,
- appraisal costs,
- internal failure costs,
- external failure costs.

Both following aspects, the very definition of "cost of quality", and unambiguous assessment of the costs incurred during the implementation and improvement of the Quality Management System is very difficult to determine. Without a doubt, the total cost is dependent on the size and characteristic of each individual company and the efficiency of the Quality Management System. It should also be noted, that the costs incurred in the implementation phase represents only a small portion of the cost that the organization will have to spend for the maintenance, improvement, certification and periodic re-certifications of the already functioning management system. Undoubtedly, the implementation of the Quality Management System is an investment, so it seems reasonable to question its viability in financial terms. Based on the analysis of available data found in the professional literature, we cannot form a clear opinion on the subject. The basic conclusion drawn from the analysis presented findings suggesting no clear argument for a positive ratio requirements of ISO 9001 to increase the financial efficiency of the surveyed organizations. This is due to the fact that the effectiveness of these systems in each case should be considered in the context of the goals that the organization wants to achieve the precision of the determination of what others expect of her. Quality objectives are part complementary to other organizations for purposes such as growth, funding specific projects or profitability. Can be, therefore, say that the quality management system can only help to achieve these objectives because the same quality management system is a means, not a goal in itself.

It seems to us reasonable though, to search for answers at the very source, that is, with members of the management boards and

teams at companies with certified Quality Management System. In order to obtain an answer to these issues respondents were asked various questions regarding the impact of costs related to the implementation and maintenance of a Quality Management

System on the effectiveness and competitiveness of the organization.

Table 2 presents the point of view of top management.

Table 1. ISO 9001 certification and financial performance in light of the literature

Year of study	Description of the research process	Summary
2002 Wayhen	Comparison of economic efficiency of the operation of 48 organizations with ISO 9001 implemented the 48 organizations not complying with the requirements of the standard. Organizations surveyed were classified into a group of small and medium-sized enterprises.	Positive correlation with ROA, No evidence on the impact of certification on gross profit,
2006 Morris	Comparison of income before income tax rate among 2068 organizations do not apply to the requirements of ISO 9001, and 680 of the implemented quality management system according to ISO 9001.	Author of studies found no evidence of a positive impact of the company to the requirements of ISO on the financial results of the surveyed organizations.
2002 Heras, Dick, Casadesus	Summarizes the financial performance of 400 organizations operating in accordance with ISO 9001 and 400 is not applicable to its demands.	Organizations certified functioned effectively in the area of the turnover and profitability.
2005 Corbet, Montes Sancho, Kirsch	An analysis of the financial results of 554 organizations before and after the implementation of the certificate of conformity of quality management system to ISO 9001.	Research shows improvement of financial results after the certification by the surveyed organizations.

Source: own study based on tile Kafel (2008)

Table 2. Impact of the certification on the organization (according to management)

How, in your opinion, is ISO 9001 affecting the financial health of your business: (please select as many options as required)	Replies
	in %
Forces the quality of the product above the necessary level, increasing the cost of running a business and driving the price of the products up,	20
By the high costs of implementation and maintenance affect the economic efficiency of the enterprise,	50
By avoiding a cost of non-conformances in products and services, improves the efficiency of a business and decreases the price of the products,	0
Minimizing the cost of internal and external defects increases economic efficiency of your enterprises,	10
Has no effect on the manufacturing cost of product (service)	20

Source: results of own research

The responses to the surveys indicate that, the vast majority of executives negatively

assess the impact of the Quality Management System on the operating costs

of the organization. According to 50% of respondents, costs related to the implementation and maintenance of the system is so high that undercut the economic viability of the organization. It strongly suggests, that small and medium-sized commercial enterprises, which every day struggles with problems related to payment delays, congestions and backlogs from financial providers, are not financially prepared to carry the cost required for the maintenance of the system. Managers of small and medium-sized commercial organizations, while appreciating the positive aspects of the ISO 9001 standard have, in the first place, care for company's financial liquidity and its economic considerations. There are also opinions that enforcement of the requirements of the quality standard somehow forces the quality of the product beyond the expectation of senior management and implemented strategy, what has in return the negative impact on the price structure of services provided. The vast minority of respondents speak favorably about the impact that the implementation of the system has on the cost of quality. Only 10% of them emphasizes that compliance with the requirements of ISO 9001 minimize the internal deficiencies in the company, what in return brings a profit to the organization.

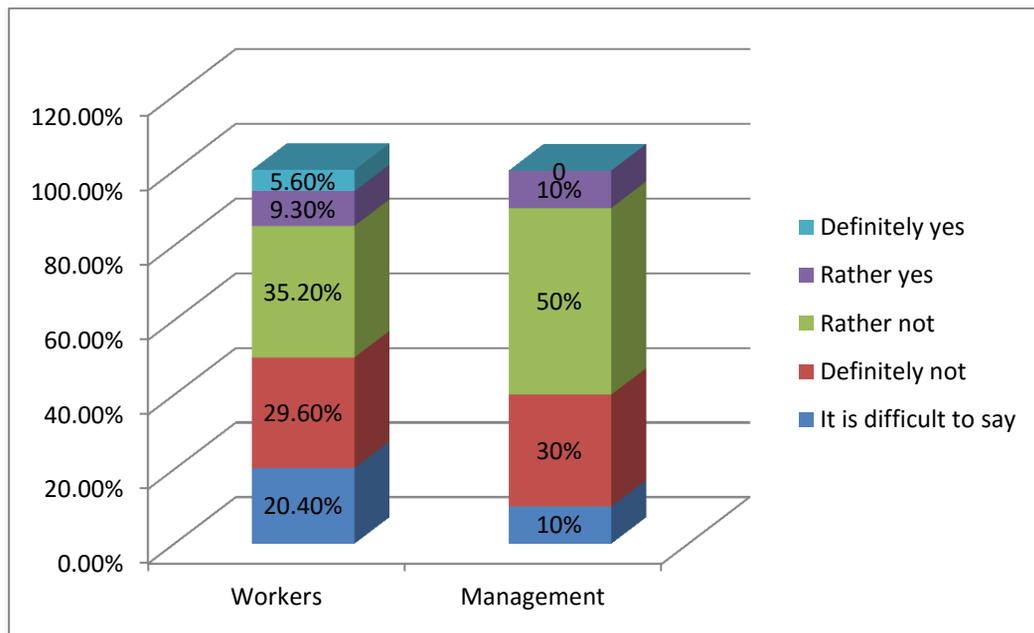
Analysis of employee's responses (Table 3) highlights the similarity to those received from top management. The vast majority of respondents (43.5%) considered that the Quality Management System creates too high quality of service, and forces the increase in prices. About 16% says that after the implementation of the Quality Management System standard service prices remained unchanged, while none of the staff had noticed a reduction in prices of services

for several years of operation. Quite a number of opinions are that the implementation of a standardized system may affect the economic viability of the company. It seems, therefore, that the respondents come from the assumption that an attempt to achieve very high levels of service quality can have a negative impact on other aspects of the organization, especially financial.

Another question, which was addressed to the representatives of both management and employees, was formulated as follows: Do you believe that savings arising from the introduction of a Quality Management System according to ISO 9001 are higher than the costs incurred for its implementation and operation? The intention was to deepen the analysis of cost of quality incurred by organizations. Responses are summarized in Figure 1. Most of the members of the boards (which are confirmed by direct interviews) argue that the cost of certification appears to be disproportionate to the benefits obtained. Given the above opinions, it's not surprising that among the members of the boards as many as 80% points to the increase of overall cost to the organization after the implementation of the Quality Management System standard. A similar opinion was expressed by 64.8% of the representatives of the crew. Only 10% of the board members and less than 15% of the staff recognizes that the implementation of the Quality Management System gives the organization more savings than losses. To sum up obtained results, it is obvious that the vast majority of respondents said that the implementation of a Quality Management System according to ISO 9001 is a significant financial burden on small and medium sized business organizations.

Table 3. Impact of the certification on the organization (according to staff)

How, in your opinion, is ISO 9001 affecting the financial health of your business: (please select as many options as required)	Replies
	in %
Forces the quality of the product above the necessary level, increasing the cost of running a business and driving the price of the products up,	43.5
By the high costs of implementation and maintenance affect the economic efficiency of the enterprise,	21.0
By avoiding a cost of non-conformances in products and services, improves the efficiency of a business and decreases the price of the products,	4.8
Minimizing the cost of internal and external defects increases economic efficiency of your enterprises,	11.3
Reduces the cost per unit of product (service)	0.0
Has no effect on the cost per unit of product (service)	16.1
In other way	3.2



Source: results of own research

Figure 1. Comparison of savings and costs associated with the implementation of standardized Quality Management System

However, it should be noted that quality costs by themselves do not improve quality (Omurgonulsen, 2009).

In order to verify the results obtained χ^2 independence test was applied. On the basis of calculations it was found that:

- Taking into account the views of employees and test χ^2 ($p = 0.0006$), there is a high correlation between the need of the implementation of ISO 9001, and its impact on the increase in the cost of the organization.
- Executives who recognize that ISO 9001 infringes the economic efficiency of enterprises claim that the implementation of standards does not produce sufficient profits ($p = 0.0054$).
- The degree of satisfaction with the functioning of the quality management system significantly affects the assessment of the effectiveness of ISO 9001 ($p = 0,0059$).

3. Financial liquidity ratios

The current ratio is considered to be the primary determinant of the organization's ability to pay all its current liabilities by realizing all available assets. This ratio is expressed as a comparison of current assets to current liabilities as shown by the following equation:

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

Generally speaking, the higher the level of this ratio, the degree of solvency of the organization is better. Despite this fact, too high of its value suggests inefficient management of free resources and impaired profitability of the company. However, if the level is too low then it indicates a problem with regulating the organization commitments and, in extreme cases, to its insolvency. The level of liquidity ratio set in

the range of **1.5 to 2.0** is considered optimal, and guarantees the repayment obligations (Bednarski, 2007). If the level indicator clearly deviates from this range down (**falls below 1.2**) is undoubtedly a clear signal of risk to the company's financial security¹. Values of current liquidity ratios of companies associated within the purchasing group Instal - Consortium are listed in tables from 4 and 5.

When analyzing the data presented in the above tables become obvious, that organizations which implemented a standardized Quality Management System obtains measurably better results. Among the organizations following the requirements of ISO 9001, 71 % is in the safe range (from 1.21 to 2.0) assuring organization's ability to fulfill a short-term liabilities and this result is better by 9 % than of those non-ISO 9001compliant.

In addition, organizations that have not implemented the requirements of ISO 9001 are in a larger number of cases endangered by a lack of liquidity (level indicator less than 1.2), and only within this group exists organizations who reported level of current ratio less than one. Within both groups there are a very similar percentage of organizations experiencing the excess of the liquidity (level ratio above 2.0). Another indicator of liquidity is the so-called quick ratio that is used as deeper analysis of liquidity, as its determination on the basis of total assets is not always justified. Current assets do not belong to a homogeneous group and are characterized by varying degrees of liquidity. Then arises the need to exclude from this group the stocks which cannot be quickly liquefied and additionally a number of other stocks may not be sellable at all (Jachna and Siepińska, 2004).

Table 4. Summary of the current liquidity indicators in organizations that have not implemented the Quality Management System according to ISO 9001 for years 2006 to 2010

Level of Current Ratio	2006	2007	2008	2009	2010	Average Value
	% of companies					
>2.0	13.50	10.50	12.5	18.75	31.25	17
1.51 – 2.0	40,5	22	20.75	12.5	9.25	21
1.21 – 1.5	24	25	43.5	55.25	57.25	41
1.0 – 1.2	18.75	25	25	12.5	0	16
less than 1	12.0	5.75	0	0	7.25	5

Source: results of own research

Table 5. Summary of the current liquidity indicators in organizations implemented a Quality Management System according to ISO 9001 for years 2006 to 2010

Level of Current Ratio	2006	2007	2008	2009	2010	Average Value
	% of companies					
>2.0	14.67	0.0	32.3	13	16.67	15.33
1.51 – 2.0	16.67	37.33	0.0	56.0	49.0	31.8
1.21 – 1.5	23	26	40.75	56.0	50,25	39,57
1.0 – 1.2	0.0	16.7	16.7	16.67	16.67	13.3
less than 1	0.0	0.0	0.0	0.0	0.0	0.0

Source: results of own research

Summarizing, a quick ratio is very similar to the current ratio, where the only difference is in the elimination of all those positions characterized by the longest period of time needed to convert them into cash, primarily inventory and accruals. Therefore, in analyzing liquidity it is worth to take advantage of the quick ratio that is expressed by the following formula:

$$\text{Quick Ratio} = \frac{(\text{Current Assets} - \text{Inventories})}{\text{Current Liabilities}}$$

The ideal level of quick ratio should oscillate around 1.0, because this level guarantees that the company will be able to settle current liabilities as quickly as possible. The higher level of the indicator suggests over-liquidity, while low cripples the ability for current

payments. Of course, not every industry is equal, so the index level should be considered as an average. It is worth remembering, especially for service industry, where the value of inventory is low and those dependencies might not exist. In trade

businesses, especially retail, receivables are relatively low. Noticeable differences between the current and quick ratio indicates that quite a large part of the inventory is relatively slowly converted into cash.

Table 6. Summary of the quick ratios in organizations that have not implemented the Quality Management System according to ISO 9001 for years 2006 to 2010

Level of Quick Ratio	2006	2007	2008	2009	2010	Average Value
	% of companies					
>1.1	12.25	12.75	10.75	18.75	33.25	17,5
0.91 – 1.1	20	30	43.75	56.25	56.25	21.25
0,6 – 0,9	0.0	16.7	16.7	16.67	16.67	52,5
less than 0.6	11,5	0.0	13.5	12.5	6.25	8.75

Table 7. Summary of the quick ratios in the organization implemented a Quality Management System according to ISO 9001 for years 2006 to 2010

Level of Quick Ratio	2006	2007	2008	2009	2010	Average Value
	% of companies					
>1.1	22.0	17	14.5	18.75	31	20,67
0.91 – 1.1	16.67	40.33	23.75	6.25	16.25	20,67
0.6 – 0.9	66.67	50.00	50.00	50.00	50.00	53.33
less than 0.6	0.00	0.00	0.00	16.67	0.00	3.33

Source: results of own research

Analyzing distribution of the results leads to the conclusion of no visible differences in both surveyed groups. Textbook level occurs in over 20% of businesses regardless of the implementation of standardized Quality Management standards. The only drawback is that about 9% of organizations which do not follow the ISO 9001 standards find quick ratio disturbingly low, which is of less than 0.6, what indicates a serious threat to level of liquidity.

4. Financial support indicators

Any company to function properly and reach higher goals have to use a variety of funding sources (both their own and foreign as well as short and long term). Assessment of company's debt level reveals a type and a source of financing assets. This knowledge allows the selection of optimal debt strategies, accounting for the degree of risk and financial stability of the company. For

this purpose many of the indicators covering the area of financial support could be used, but the most important of these include:

- Debt Ratio
- Equity Ratio

The role of the first of the identified indicators is to determine the level of funding by borrowed capitals. It is expressed by the following formula:

$$\text{Debt Ratio} = \text{Total Liabilities} / \text{Total Assets}$$

Referring to the "golden rule" of financing the optimal level of this ratio should be **0.5**. It is understood, however, that if this ratio

varies in the range of **0.57 - 0.67**, in such an organization there is a balance between the level of equity and debt. Another important issue is the impact of the size of the organization on affordability for debt. Large companies will have an advantage in obtaining financing over the small; in addition, lenders are willing to provide to them more favorable offer, because it is much more significant to lose a large counterparty other than small one. The values of total debt for the surveyed organizations are shown in the tables 8 and 9.

Table 8. Summary of the debt ratios in organizations that have not implemented the Quality Management System according to ISO 9001 in years 2006 – 2010

Total Debt Ratio Level	2006	2007	2008	2009	2010	Average Value
	% of companies					
0 – 0.3	0.00	0.00	0.00	10.00	15.00	5.00
0.31 – 0.5	30.25	25.00	25.00	25.00	19.75	25.00
0.51 – 0.7	44.75	42.75	56.25	50.00	37.50	46.25
0.71 – 0.9	16.75	31.25	12.75	12.50	25.00	21.25
more than 0.9	6.25	0.00	0.00	0.00	6.25	2.50

Source: results of own research

Taking into account the results from the tables reveals, that organizations not in compliance with the requirements of ISO 9001 shows slightly better values of total debt than other companies, since as many as 46.25% of them achieve results considered very correct. In addition, almost 10% less organization from this group exceeds the level considered safe (0.71) which suggests company's lack of credibility in relation to external lenders.

Taking into account the results from the tables reveals, that organizations not in compliance with the requirements of ISO 9001 shows slightly better values of total debt than other companies, since as many as 46.25% of them achieve results considered very correct. In addition, almost 10% less organization from this group exceeds the level considered safe (0.71) which suggests company's lack of credibility in relation to external lenders.

Table 9. Summary of the debt liquidity ratios in the organization of the implemented Quality Management System according to ISO 9001 in 2006 – 2010

Total Debt Ratio Level	2006	2007	2008	2009	2010	Average Value
	% of companies					
0 – 0.3	0.00	0.00	0.00	0.00	0.00	0.00
0.31 – 0.5	33.33	33.33	33.33	33.33	33.33	33.33
0.51 – 0.7	33.33	0.00	33.33	40.00	60.00	33.33
0.71 – 0.9	33.33	66.67	33.33	16.67	16.67	33.33
more than 0.9	0.00	0.00	0.00	0.00	0.00	0.00

Source: results of own research

Another indicator refers to information related to the size of the own resources involved, which after adding to the total debt ratio should equal **1.0**. A good predictor is a noticeable increase in the size of this index, because it leads to the strengthening of the

financial base of the company. The share of equity in the financing of assets is expressed by the following formula:

$$Equity\ Ratio = Total\ Equity / Total\ Assets$$

Table 10. Summary of the relevant indicators of equity ratio in the financing of assets in organizations that have not implemented the Quality Management System according to ISO 9001 in 2006 – 2010

Index Level of Equity Ratio	2006	2007	2008	2009	2010	Average Value
	% of companies					
0 – 0.2	18.75	10.25	12.25	6.25	6.25	10.75
0.21 – 0.4	40.75	56.25	40.75	59.25	56.25	50.50
0.41 – 0.6	37.50	37.50	25.00	18.75	18.75	27.50
more than 0.6	0.00	0.00	12.50	25.00	18.75	11.25

Source: results of own research

Table 11. Summary of the relevant indicators of equity ratio in the financing of assets in the organization of the implemented Quality Management System according to ISO 9001 in 2006 – 2010

Index Level of Equity Ratio	2006	2007	2008	2009	2010	Average Value
	% of companies					
0 – 0.2	0.00	16.67	16.67	16.67	16.67	13.33
0.21 – 0.4	66.67	42.50	42.50	33.33	16.67	40.33
0.41 – 0.6	15	33.33	33.33	33.33	50.00	33.00
more than 0.6	33.33	0.00	12.50	16.67	16.67	13.33

Source: results of own research

Analysis of the results points to very minimal differences within the studied groups. Enterprises operating under a Quality Management System standard more often achieve a higher level of equity in the financing of assets. This is considered a good predictor, since the higher the inclusion of equity over assets, then the organization is more credible to creditors.

5. Conclusion

The study shows that the costs associated with the implementation and maintenance of the Quality Management System standard is still too high, and effectively discourages representatives of small and medium-sized commercial organizations from implementing ISO 9001 system. More than half of the representatives of respective boards emphasizes that these costs are so high that in consequence could negatively affect the economic health of the enterprise. Employees, in turn, in over 43% cases believes, that the standardized Quality Management System forces very high quality of services, what in turn translates to a very large price increase. In addition, as

much as 80% of board members believe that the costs of certification and maintenance of the system are much higher than the savings achieved from its implementation. These statements confirm that the implementation of standardized Quality Management System is a big burden on small and medium-sized firms. In this situation it's advisable for small and medium-sized commercial organizations to implement only the selected elements of ISO 9001, without seeking a Quality Management System certification. That approach would significantly reduce the costs needed for the maintenance and certification of the system.

Finally, it is worth noting that in each group of associated organizations the analysis of economic efficiency revealed a positive result that the implementation of standardized Quality Management Systems had on the financial condition of the organization, as: Organizations that didn't implement a Quality Management System are, in a larger number of cases, endangered by the lack of liquidity, while at the same time achieving slightly better results in overall debt ratio.

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