ORIGINAL SCIENTIFIC PAPER

RECEIVED: NOVEMBER 2017

REVISED: NOVEMBER 2017

ACCEPTED: NOVEMBER 2017

DOI: 10.1515/ngoe-2017-0024

UDK: 005.523:005.6:005.642

JEL: M12

Citation: Grušovnik, D., Kavkler, A., & Uršič, D. (2017). Dimensions of Decision-Making Process Quality and Company Performance: A Study of Top Managers in Slovenia. *Naše gospodarstvo/Our Economy*, *63*(4), 66-75. DOI: 10.1515/ngoe-2017-0024

Dimensions of Decision-Making Process Quality and Company Performance: A Study of Top Managers in Slovenia

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Abstract

This paper investigates the relationship between the dimensions of the decision-making process quality and company performance of top managers' in Slovenia. We found out that companies whose managers exhibit an above-average dimension of openness of spirit in the quality of the decision making process, on average, have a higher stance on foreign markets as companies in which managers show a below-average open spirit. For the managers who work in companies that are present in foreign markets, we could confirm that there is a low/weak correlation between the dimension of effort of the decision-making process quality and the number of employees in a company.

Keywords: quality of the decision-making process, rationality, motivation, participation, exhaustivity of the information, managers effort, creativity and innovativeness, company stakeholders, company performance.

Introduction

Decisions are the core transactions of organizations. Successful organizations outperform their competitors when they make their decisions in at least three ways: They make better decisions, they make decisions faster, and they implement more decisions (Harrison & Pelletier, 2000; McLaughlin, 1995). Decision making is only one of the tasks of an executive. It usually takes a small fraction of his time. To make important decisions is the specific executive task. Only an executive makes such vital decisions (Harrison & Pelletier, 2000; Drucker, 1967). The most important quality of a manager is a willingness, even an eagerness to make large, difficult decisions (Harrison & Pelletier, 2000; Colvin, 1997).

The process of decision-making is multifaceted and intricate. At many times this process occurs naturally and spontaneous; at other times, it may be intricately

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planned with much forethought (Malakooti, 2010). Strategic decision-making research has shown that the configuration of the decision-making process itself can have a substantial impact on the final choice of strategic action (Amason, 1996; Schwenk, 1995).

The empirical analysis in this paper is based on the Guillemette et al. (2014) model of decision-making process performance. The practical purpose of the Guillemette et al. model was to help managers avoid making the same mistakes and so improve performance of the manager's decisions quality with the ultimate goal of higher organization's performance. The anonymous survey was being carried out on the 500 top Slovenian managers working in the largest companies (by revenue) in the fiscal year 2013. We wanted to connect the dimensions of the decision-making process quality and simple performance indicators of organizations of top managers in Slovenia.

Concepts Review of the Dimensions in the Decision-Making Process Quality

In the literature we searched for the models that contained the dimensions of the decision-making process quality or similar concepts to better understand this topic and to learn the similarities between authors.

Gilmore (1998) adapted from Jackson (1991) a model of quality in the management of the decision-making. Gilmore developed a practical model and upgraded it according to the developments that actually happened in the organization that he was trying to help. His stage 3 model contained effective decision making with two dimensions. The first dimension was planning (Proactive identification and problem solving. Information collecting and consideration of options. Choice of options. Consistency with other marketing activities). The second was action orientation (Delegation of responsibility. Responsibility and ownership for activity. Liaison between functions). Malakooti (2010) says that a decision-making process can be seen as a model of four dimensions: information processing, alternative generation, alternative evaluation, and decision closure.

Malaska and Holstius (1999) say that a modern view of good decision making can be already found in thoughts and teachings of Aristotle. For a good decision we need to combine with the help of sound logic, three kinds of knowledge: knowledge about purpose and objectives, knowledge about understanding the situation, and knowledge about the available means and resources. A good decision can only be reached if we thoroughly use all three kinds of required knowledge at the same time in the environment we are faced with.

Harrison and Pelletier (2000) distinguish between seven dimensions in the decision management: organization (What are the objectives of the organization?), level (By which level of management are the decisions being made, top or middle management?), significance (How do this decisions measurably contribute to the growth and prosperity of the organization? Are they short or long-term decisions?), rationality (Management decisions are eminently rational because they are oriented to the attainment of long-term objectives.), strategy (A strategy says when an objective should be reached, and objectives can only be reached through management decisions.), outcome (The attainment of the objectives that were initiated by the managerial decision-making process.), and finally the uncertainty (The presence of uncertainty can't be prevented, but it can be reduced with the effective use of theories and concepts).

Rausch and Anderson (2011) developed eight guidelines that should be considered when making significant decisions. The use of these guidelines in the decision-making process should produce high quality decisions because they help to ensure that few if any relevant issues are ignored: 1. Communications; 2. Appropriate participation; 3. Competence assessment and development; 4. Ensuring at least adequate satisfaction; 5. Setting goals/objectives and working toward their achievement; 6. Ensuring coordination, stimulating cooperation, preventing and resolving conflict; 7. Working with norms including those that pertain to ethics, diversity, and organizational justice; 8. Fair and comprehensive project and performance reviews, and performance evaluations. The first six guidelines are present in almost any type of decision while the other remaining guidelines are applicable only in certain types of decisions.

Ying-Chieh et al. (2013) decision quality in a forecasting model consists of the following six key principles: 1. Immediate and rich information, including complete date from the past. 2. Precise forecasting model. 3. Control of key forecasting parameters and random factors. 4. Distance of forecasting point and current time point (the closer they are, the more precise the forecasting value will be). 5. Immediate and multi-frequency feedback rate in a decision-making process missile control model. 6. Overall system thinking and rational decision-making evaluation.

Guillemette et al. (2014) identified four dimensions of the decision-making process quality: Procedural rationality (The limit to which we gather useful information); Exhaustivity of information (Completeness of available information); Do we have enough available information to make quality decisions?), Effort (Motivation and focus on decision-making); Openness of spirit (Openness to new ideas, sources of information and applications. Willingness to go beyond own borders and find alternatives).

Concearning the exhaustivity of information in decision-making process, the theory of Eisenhardt (1989) notes that decision speed is not necessarily slow when decision makers use more information, consider many options, and attempt to integrate input. When, on the other hand, a person has intimate knowledge of an area, rapid decisions can be made even when multiple resources of input are considered. Driver et al. (1990) say that people have different decision-making styles differ with the respect to the amount of information people use, the number of alternatives they consider, and the extent to which they attempt to integrate and coordinate multiple sources of input.

The Guillemete et al. (2014) study was focused on high impact decisions. Examples of high impact decisions are: implementation of a new information technology, investing in the development, terminating a marketing campaign, abandoning a production of an existing product, etc. According to Dean and Sharfman (1996), Cabantos and Gond (2011), and Klingebiel and Meyer (2012), such decisions are not made by an individual in isolation, but are influenced also by other stakeholders (top-managers, colleagues and employees). On the other hand, managers in these highly political contexts are somewhat rational in their choices, making trade-offs if required and adapting as needed. Wagner-Mainardes et al. (2012) distinguishes the stakeholders from the perspective of their influence, from the most influential to the least influential: regulatory controller, partner, passive, dependent.

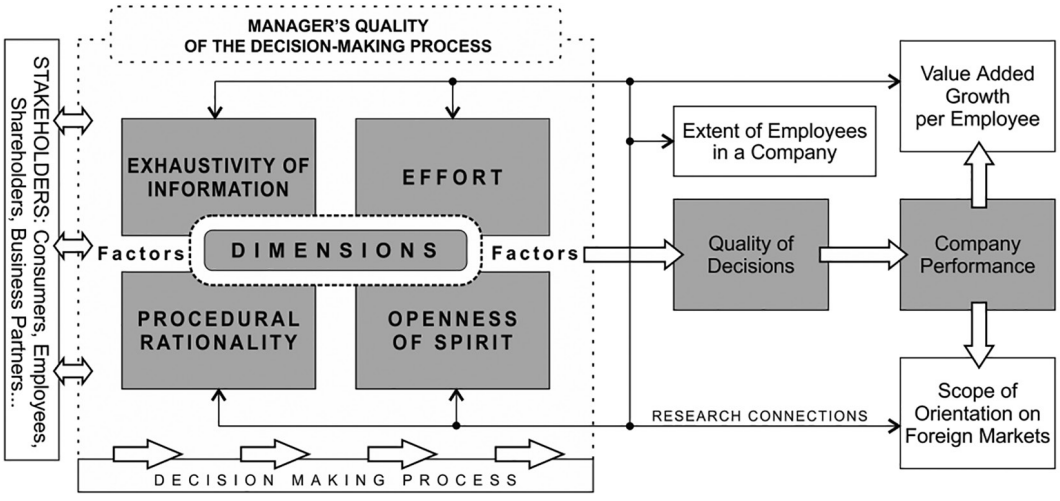
Research Model and Survey

The research model contains the four dimensions of the decision-making process quality as proposed from Guillemette et al. (2014) (Figure 1). 500 managers were contacted and asked by e-mail to participate in the survey; 112 managers out of 500 answered all the questions in the internet survey. The 500 selected managers, were the leaders of the 500 biggest companies in Slovenia (by turnover) in fiscal year 2014. We used the same questionnaire as Guillemette et al. (2014). The questions were randomly mixed in the same unstructured way as the Guillemette et al. (2014) questionnaire. The managers were not given hints that a certain question is in a certain dimension of decision-making process quality, nor were they aware that different dimensions of decision-making process quality exist. Managers were asked to recall the actions in the past when they were making important decisions.

The research questions of our interest are visible in Figure 1:
- Is there any positive correlation between a certain dimension of decision-making process quality and a certain performance measure?
- Do managers who exhibit an above average quality of a certain dimension of the decision-making process, have on the average a higher value of a performance indicator than those who exhibit a below average quality of a certain dimension of the decision-making process?

The decision-making process quality is calculated when we divide the actual received sums of a certain dimension with the maximum possible sum of a certain dimension and then multiply it with the weights of the Guillemette et al. (2014) model; procedural rationality represents 19.9% of the total decision-making process quality; exhaustivity of information represents 24.4%; effort represents 36.6%; and openness of spirit represents 19.1%. The performance measures in Figure 1 were chosen by the authors and are the following: yearly value added growth per employee (growth for the year 2014; measured up to one-tenth of the

Figure 1. Research model



Source: Adapted upon Guillmette et al. (2014)

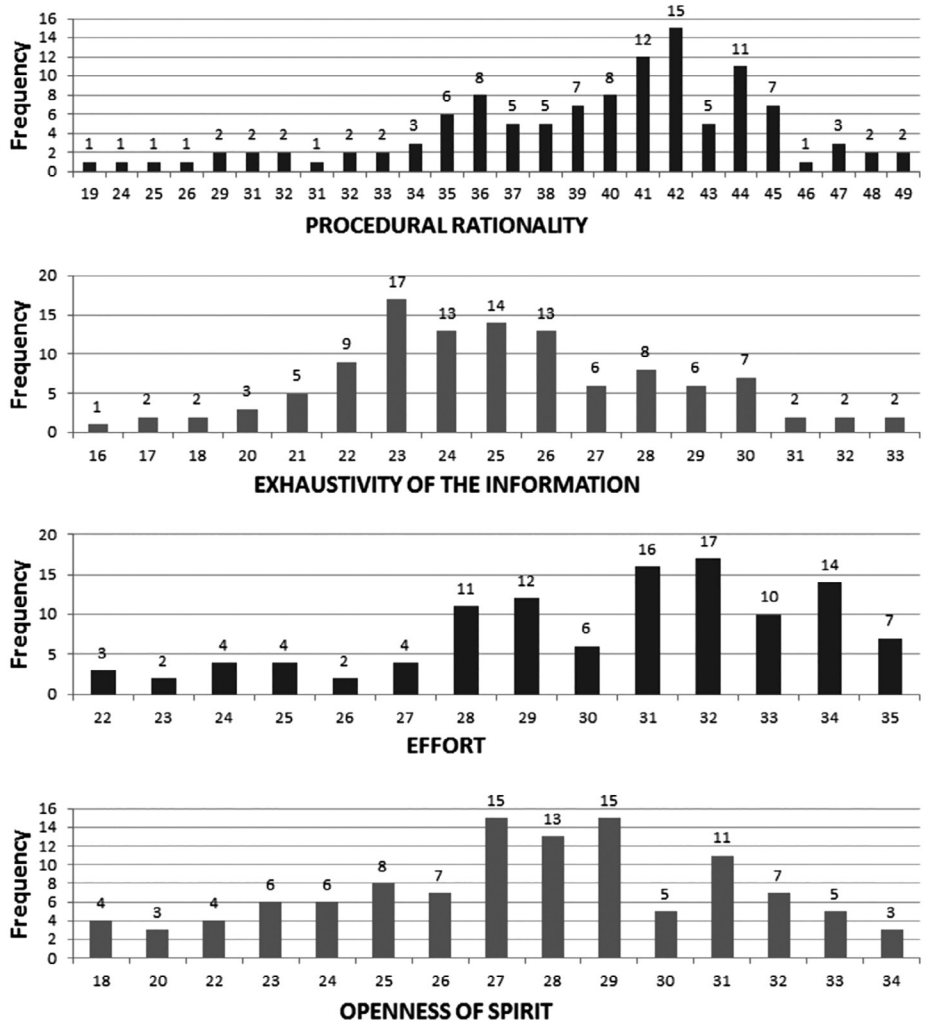
percent accurately), scope of orientation on foreign markets (value for the year 2014; measured in percent), and extent of employees in a company (current number in March 2015; measured in intervals). For the number of employees in a company we had the following ranks: 1 (≤50), 2 (51-100), 3 (101-250), 4 (251-500), 5 (501-1000), and 6 (≥1001).

Empirical Analysis

Our variables of the decision-making process quality were measured on a 7-point Likert scale and are interval scale variables, because the intervals from strongly disagree to strongly agree, are equally large and symmetrical. When a Likert scale is symmetric and equidistant it behaves more like an interval-level measurement and therefore, in practice, Likert scales are often viewed as an interval scale (Carifio & Perla 2007). The dimensions of decision-making process quality were calculated with the sum of variables that they contain, according to findings of the Guillemette et al. (2014) model. The extent of employees in a company was measured in unevenly large ranks and is, therefore, an ordinal variable. Value added growth per employee and scope of orientation on foreign markets, were measured in percent and are numeric variables. The dimension of exhaustivity of information was the sum of 5 interval scale variables, the dimensions of procedural rationality was the sum of 7 interval scale variables, the dimension of effort was the sum of 5 interval scale variables, and the dimension of openness of spirit was the sum of 5 interval scale variables.

In the Figure 2 we see the histograms of the sums of the dimensions of the decision-making process quality without the incorporated weights and with their frequencies. The dimensions of the procedural rationality, effort, and openness of the spirit are asymmetric to the left, while the dimension of exhaustivity of information is asymmetric to the right.

Figure 2. Histograms of sum frequencies of the dimensions of decision-making process quality (without incorporated weights; group size: 112 managers)



Source: Own research.

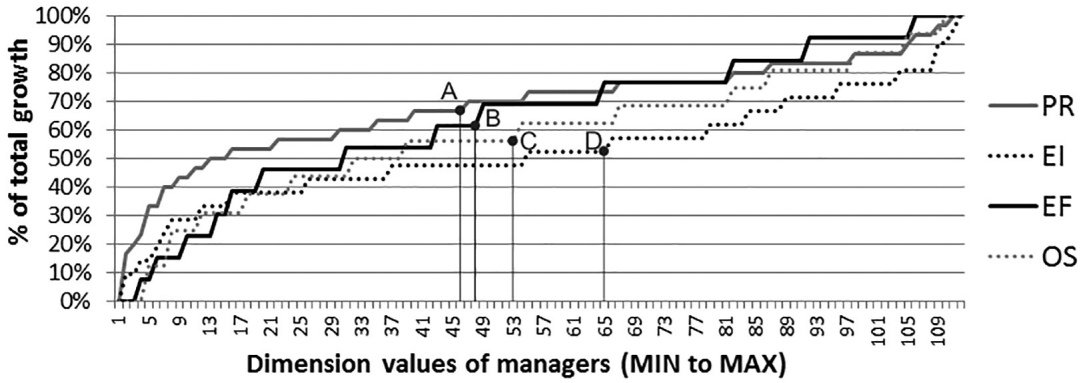
17 (17 managers out of 112) was the highest frequency of sums in the dimension of exhaustivity of information and in the dimension of effort. The dimensions of procedural rationality and openness of spirit had the highest sum frequency of 15.

The next graph (Figure 3) shows the percentage of the growth path of the sums of the dimensions of the decision-making process with incorporated weights, from the minimal to the maximal value (this graph was built in the program Excel). The curve of the dimension of procedural rationality reaches the mean value (point A) at first, which is between the 46th and 47th value (68.5% of the growth path). This is also visible from the graph, where the curve of procedural rationality in the first half is clearly above all others. The dimension of effort reaches the mean value (point B) between the 48th and 49th value (63.9% of the growth path), and is followed by the dimension of openness of spirit with the mean value (point C) between the 53th and 54th value (58.8% of the growth path), and at the last place is the dimension of exhaustivity of information which reaches the mean value (point D) between the 65th and 66th value (52.7% of the growth path).

The median values are reached in all the dimensions in the interval between the 64th and 66th value. They are ordered the same as the previous mean value examples and the path percentages of the first three are higher this time (procedural rationality 73.3%; effort 69.2%; openness of spirit 62.5%; and exhaustivity of information 52.3%, almost the same for the mean and median value).

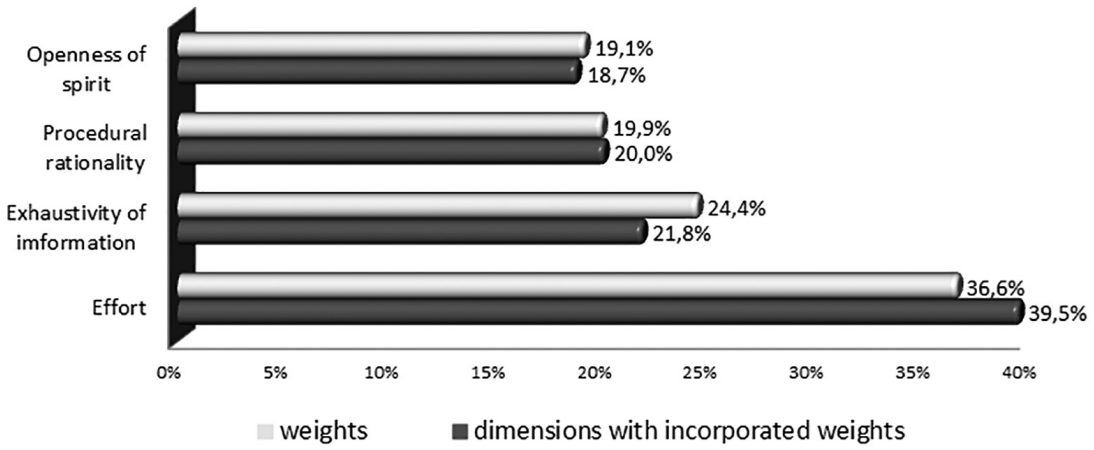
All the mean and median values clearly exceed 50% of the growth path, which means that the difference between the above average managers are clearly smaller than the differences between the below average managers. As the quality of dimensions of the decision-making process rises the differences between managers are becoming smaller.

Figure 3. Growth behavior of dimensions of the decision-making process quality for the path between the minimum and maximum values in % (with incorporated weights; group size: 112 managers)



Notes: PR (procedural rationality), EI (exhaustivity of information), EF (effort), OS (openness of spirit).
Source: Own research.

Figure 4. Comparison of Guillemete et al. (2014) weights with research values



Note: group size of 112 managers
Sources: Guillemette et al. (2014) and own research.

When we compare the Guillemette et al. (2014) weights of the dimensions of the decision-making process quality, with the average sums received and then multiplied with Guillemette et al. (2014) weights (we calculated their percentage so they would total 100%), the differences are small and the ranking of the dimensions stays the same (Figure 4). The sums with incorporated Guillemette et al. (2014) weights of the dimensions of effort (+2.9%) and procedural rationality (+0.1%) are higher than the original weights. The sums with incorporated weights of the dimensions of exhaustivity of information (-2.6%) and openness of spirit (-0.4%) are on the other side smaller than the original weights.

Findings and Discussion

We began our empirical research with the testing of different combinations of variables. The combinations should contain at least one dimension of the decision-making process quality and one performance indicator. We used cluster analysis. All the statistical analyses in this paper were performed in SPSS v22.0.0.0. Our goal was to find a cluster in which all averages it contained, clearly higher in comparison to all averages in other clusters that would be created. Cluster analysis is a multivariate method. Given a set of data objects (also known as patterns, entities, instances, observances, or units), cluster analysis aims to explore natural and hidden data structure and to provide insights to the questions such as, "Are there any clusters (groups, subsets, or categories) in the data, and if yes, how many clusters are in the data? (Xi & Wunsch II, 2008).

We used a two-step cluster analysis with unforced option of forming the desired cluster number. A two-step clustering can handle scale and ordinal data in the same model. Two-step cluster analysis also automatically selects the number of clusters (Cornish, 2007).

Table 1 presents the results of our efforts. The first interesting cluster contains the variables of scope of orientation on foreign markets, the dimension of effort, the dimension of procedural rationality, and the dimension of openness of spirit. The cluster analysis was performed only in the

Table 1. Two-step cluster analysis results

Variables: scope of orientation on foreign markets, dimension of effort, dimension of procedural rationality and number, and dimension of openness of spirit. Cluster quality: fair. Group size: 86 managers.			
Cluster	2	1	Input importance
Size	65.1% (56)	34.9% (30)	
Input averages	Foreign markets 72.12	Foreign markets 20.80	1.00
	Effort 31.45	Effort 27.57	0.68
	Procedural rationality 41.43	Procedural rationality 35.83	0.53
	Openness of spirit 28.62	Openness of spirit 25.00	0.49
Variables: number of employees, scope of orientation on foreign markets, dimension of openness of spirit, dimension of effort, and dimension of procedural rationality. Cluster quality: fair. Group size: 86 managers.			
Cluster	1	2	Input importance
Size	59.3% (51)	40.7% (35)	
Input averages	Number of employees 3.20	Number of employees 5.09	1.00
	Foreign markets 35.37	Foreign markets 80.09	0.86
	Openness of spirit 26.04	Openness of spirit 29.29	0.45
	Effort 29.10	Effort 31.54	0.31
	Procedural rationality 38.08	Procedural rationality 41.51	0.24

Source: Own research.

group of managers who work in companies that make their income also in foreign markets. Average silhouette of cohesion and separation, an indicator for cluster quality, was 0.5, which indicates a fair cluster quality. The averages in the larger cluster (65.1% or 56 managers out of 86) are all clearly above the averages in the remaining cluster. The largest percent difference of averages, considering the inputs average sizes, is in the scope of orientation of foreign markets (51.32% difference), which is large, and is followed by the difference of the dimension of effort, followed by the dimension of procedural rationality, and lastly, the dimension of spirit.

Interestingly, we had to use at least a combination of three dimensions of the quality of the decision-making process in combination with a performance indicator, to create a cluster containing all the averages with the highest values and that are, at the same time, noticeably higher than the averages of other clusters. We could only repeat our desired goals when we additionally added the variable of the number of employees in a company. Average silhouette of cohesion and separation, which is an indicator for cluster quality was 0.4, which indicates a fair cluster quality.

Thus managers in companies that are present in foreign markets in our clusters have on average a higher scope of orientation on foreign markets, have on average more employees, and have on average a higher decision-making process quality in the dimensions of procedural rationality, effort, and openness of spirit. As we additionally added the dimension of exhaustivity of information to the previous combination of variables, we did not get fair results, which is expected because of the histogram structure (Figure 2) and the growth behavior paths of values (Figure 3). So it's clear the dimension of the exhaustivity of information does not give a positive contribution to the cluster with highest averages.

Based on what we learned in the process of two-step cluster analysis we performed various statistical tests (Table 2) between the dimensions of procedural rationality, effort, openness of spirit, and the performance indicators of scope of orientation on foreign markets and the number of employees in a company (for only the group of 86 managers whose companies are present on foreign markets).

The first positive result was when we performed the Mann-Whitney U test on the variable number of employees, between managers with below average and above average dimension of effort (measure of success was the mean value). The difference between groups was statistically significant at $p<0.05$ level. The average for the variable of number of employees with above average dimension of effort was 4.29, and the average for those with below average dimension of effort was 3.56 (these values were calculated in Excel). If we compare rank 3 (101-250) and rank 4 (251-500), or even rank 5 (501-1000), then we see that this are very large differences in number of employees.

The second positive result was when we performed the Mann-Whitney U test on the variable stance on foreign markets, between managers with below average and above average dimension of openness of spirit (measures of success was the mean value of 27.36 and median value of 27.5, which divided the group identically). The average for the variable of scope on foreign markets, for those with above average dimension of openness of spirit was 62%, and the average for those with below average dimension of openness of spirit was 45% (these values were calculated in Excel). The differences between groups were statistically significant at $p<0.05$ level.

The third positive result was when we performed an independent samples t-test between the managers with above-average and below-average dimension of openness of spirit in

Table 2. Dimensions of decision-making process quality with positive results of statistical testing

Dimensions	Performance measure	Measure of success	MWU	t-test	ES	rs
Effort	stance on foreign markets	M	0.924	0.892		0.065
		MD	0.665	0.783		
	number of employees	M	0.019*			0.213*
		MD	0.113			
Openness of spirit	stance on foreign markets	M	0.011*	0.031*	ME	0.180
		MD	0.011*	0.031*	ME	
	number of employees	M	0.230			0.099
		MD	0.230			

Notes: success measure (M – mean, MD – median); MWU – Mann-Whitney U statistics; ES – effect size (ME – medium size); r_s – Spearman correlation coefficient; *significant at 0.05 level; N = 86 (managers whose companies are present on foreign markets).

Source: Own research.

the quality of the decision-making process, and the scope of orientation on foreign markets. The measures of success were the mean and median value. At a 0.05 level of significance the above-average had a higher scope of orientation on foreign markets than the below-average. The Levene's test for equality of variances was not statistically significant, so equal variances between the groups are assumed. We also calculated the effect size with the Cohen's d coefficient, which calculates the overlapping of the values of the control and the research group. Effect size is a quantitative measure of the strength of a phenomenon (Kelley & Preacher, 2012). The effect sizes according to the Cohen's d coefficient are when the absolute value of the coefficient is the following: very small – 0.01; small – 0.2; medium 0.5; large 0.8; very large 1.2; and huge 2.0 (Cohen, 1988; Cohen, 1992; Sawilowsky, 2009). Cohen's d coefficient is calculated the following way: mean of the 1. group, minus the mean of the 2. group, divided with the pooled standard deviation. The pooled standard deviation is the root value of: squared standard deviation of the 1. group, minus the squared standard deviation of the 2. group, and divided with number 2 (Cankar & Bajec, 2003). The Cohen's d coefficient was -0.478. The negative sign means that the research group was larger than the control group and the value that there is a medium effect size.

The fourth positive result was when we performed a Spearman correlation test between the dimension of effort and the performance indicator of number of employees of companies that are present on foreign markets. The Spearman correlation coefficient was 0.213, significant at a level of 0.05, which is a low/weak positive correlation. So we could only partially confirm the assumption.

Conclusions

Through testing we were able to statistically confirm the following facts:

In Slovenia, companies whose managers exhibit an above-average openness of spirit in the quality of decision-making process, on average, have a higher stance on foreign markets as companies in which managers show a below-average open spirit (confirmed on a group of 86 managers). We tested these findings with the Cohen's d coefficient and proven a medium-sized effect size.

This means that managers in Slovenia who have an above-average dimension of openness of spirit, have also on average, a higher scope of orientation on foreign markets. The decisions of these managers, compared to others, incorporate to a greater extent: creativity, innovation, newness, participation of various experts in decision-making, promotion of innovation of their employees, consideration and incorporation of proposals of their own consumers. Companies that generate a high proportion of revenues in foreign markets have managers with innovative decisions. We can conclude that, because of keen international competition, managers in foreign markets tend to be more creative and are more open to new ideas, if they intend to do business on a larger scale.

In enterprises in Slovenia, between the dimension of effort in the quality of decision-making process and the number of employes in a company, there is a statistically significant low/weak correlation (partially confirmed - 86 managers). The sizes of the number of employees were measured in ranks.

Companies in Slovenia focused on foreign markets, where managers show an above-average effort invested in the quality of decision-making processes, have on average a higher number of employees, as companies where managers show a below-average effort (confirmed with Mann-Whitney U statistics - 86 managers). Managers in companies with higher number of employees that generate revenue in foreign markets need to invest more effort in decision-making processes. To a greater extent, these managers need to motivate their employees, reward stakeholders, invest efforts in communication and management, invest efforts in implementing the decisions, work out action plans, and try to prevent conflicts. In other words, for managers in smaller companies, which are focused on foreign markets, there is a potential loophole for a possible increase of effort in decision-making processes in the future, relative to those in larger companies. The mean value of the number of employees in a company between managers with below-average and above-average quality of decision-making processes, ranged from the mean value 3.56 to the mean value 4.24 (ranks: 3⇒101-250; 4⇒251-500; 5⇒501-1000). This value difference suggests that the differences in the number of employees are noticeable. The differences are measured in hundreds, and are somewhere from 150 to 900 employees. Because of large differences in the mean values in the number of employees, these systems have probably a completely different mode of governance and decision-making.

Perhaps the reason for the differences is that they have a large number of systems to coordinate with their customers abroad and have more rigorous standards and requirements with which they need to comply. Large procurement errors can cost them a great amount of money and time, and could rapidly harm their reputation. Managers are well aware of this, and also that large orders bring higher returns.

Companies in Slovenia, that wish to increase their revenues in foreign markets, must to an even greater extent encourage the creativity of their managers, or look for those managers who have a very open horizon in their decision-making

process. Managers in these companies should try to listen to what their consumers expect from them. And what is that? That at this moment no one is currently developing and could be very attractive in the future for their consumers in foreign markets. Such ventures from managers require support of their key stakeholders, to enable enterprises to realize their set of visionary strategies, which always contain a certain degree of healthy risk. Dimension of the openness of spirit has a minimum weight of importance, but is at the same time closely related to motivation or effort, which is the strongest dimension. Experts pointed out that a motivated manager with their example and dominance, consciously or unconsciously encourages other employees to boost their innovation and creativity.

Managers in the under-average large companies by the number of employees in Slovenia, which generate revenues in foreign markets, should increase their dimension of effort in the decision-making process quality, if they wish to contribute an equal measure of effort than their counterparts in larger enterprises. It is recommended that they more intensively work on motivation, but they must be careful not to surpass certain borders that could trigger a sense of dissatisfaction. Very important aspects are also efficient communication, leadership, realization of decisions and rewarding the stakeholders of a company. They should not try to over-motivate their employees, but should by their example give inspiration to others. Managers of these firms have the opportunity to increase investment in their efforts to enable them to consequently bring greater focus on foreign markets. These companies, of course, do not have large sized staff, but their strength on the other hand is, that they are small and flexible and can quickly adapt their vision and the direction their business is currently heading.

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Dimenzije kakovosti procesa odločanja in uspešnost podjetja: raziskava vodilnih menedžerjev v Sloveniji

Izvleček

Prispevek obravnava odnos med dimenzijami kakovosti procesa odločanja in uspešnostjo podjetja za vodilne manedžerje v Sloveniji. Ugotovili smo, da podjetja, katerih vodilni manedžerji izkazujejo nadpovprečno veliko dimenzijo odprtega obzorja pri kakovosti procesa odločanja, imajo v povprečju višji delež prihodkov ustvarjenih na tujih trgih, kot pa podjetja, v katerih manedžerji izkazujejo podpovprečno odprto obzorje. Za menedžerje, ki delujejo v podjetjih, ki so prisotna na tujih trgih, smo lahko potrdili, da obstaja pri njih nizka/šibka povezava med dimenzijo vloženega truda pri kakovosti procesa odločanja in številom zaposlenih v podjetju.

Ključne besede: kakovost procesa odločanja, racionalnost, motivacija, soudeležba, počrpanost informacij, menedžerjev trud, ustvarjalnost in inovativnost, deležniki podjetja, uspešnost podjetja