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The impact of organizational culture on economic indices – A study in Serbian companies

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This paper presents research results whose aim was to examine and define the dependences and impact of organizational culture on the effects of business performance. The research was carried out on Serbian companies and was conducted in three stages. In the first stage, 72 parameters of organizational culture were defined and 30 experts were polled about the significance of these parameters. This was followed by factor analysis which assisted in the selection of 7 key factors of organizational culture. These 7 factors were taken as the representatives of organizational culture in Serbian companies. In the second stage, the representatives of the effects of business performance were defined. Economic indices (7 economic indices) were taken as the representatives of business effects. The third stage included an explanation of the actual state concerning the key factors of organizational culture and the selected economic indices in Serbian companies. The data was collected by polling 100 managers from 100 companies. Finally, multivariate regression and correlation were applied in order to determine the dependences of organizational culture and business effects. The research results confirm the existence of a strong relation between organizational culture and business performance. The obtained dependences show that economic indices in companies are improved by increasing the level of organizational culture. Equations are made which enable the calculation of the values of some economic indices depending on the value and level of the key factors of organizational culture within the company. An efficient review of the current state of economic indices, the simulation of the possible state of economic indices, as well as the effective selection of future activities oriented towards increasing the level of organizational culture are thus provided. These activities all contribute to improved business results.

Key words: Organizational culture, economic indices, poll, multivariate analysis, Serbia.

INTRODUCTION

Organizational culture is an important field of management today. In Serbia, however, it has not been studied in depth and there is no data on the state of organizational culture in Serbian companies or any proposals or suggestions for its improvement. What is certain is that the level of organizational culture in Serbia is very low, and that there is an unfavourable base in national culture. It may therefore be assumed that substantial changes are required in organizational culture in Serbian companies. The need for this type of research arose as a consequence of this state.

The development of organizational culture is particularly important in companies from countries in transition (Alam, 2009a). The influence of organizational culture is especially manifested in companies which have completed the process of ownership transformation (Alam and Khalifa, 2009). With the completion of the process of economic transition and with the influx of foreign capital on the market, organizational culture assumes an increasingly important role in the process of doing business inter-nationally (Alam, 2009b). Companies in Serbia are currently

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faced with the following challenges: transition, privatization and the need to accept market economy conditions. The level of organizational culture is very important in overcoming the afore-mentioned challenges and raising such a level in Serbian companies would result in improving the quality of both national and international collaboration (Pečujlija et al., 2010). Some other countries in the region, such as Romania and Greece, are facing a similar situation (Romeo, 2010).

Organizational culture is the system of divided values, value orientations, beliefs, and customs within an organization, and thereby influences the structure of the organization and directs its conduct, but also determines the norms of conduct within the organization itself (Sharplin, 1958). Riggio (2003: 422) defines culture as "the system of shared backgrounds, norms, values, or beliefs among members of a group." Van den Berg and Wilderom (2004: 571) define organizational culture as the "shared perceptions of organizational work practices within organizational units that may differ from other organizational units." Every company has its own specific organizational culture. Drennan (1990) defines organizational culture as the way things are done in an organization. Working groups within an organization have their own code of conduct within the organization itself as well as their own ways of reacting, which, when viewed in a broader context, have a direct impact on the system as a whole (Black, 2003). Organizational culture is the factor which directly influences the success or failure of an organization. For this reason attention must be paid to the key dimensions of organizational culture (Deal and Kennedy, 1982):

Values – represent the convictions, the heart of organizational culture.
Heroes – the people who represent the personification of the values.
Ceremonies and Rituals – an unofficial system of communication or concealed hierarchy of power in the organization.

Unifying individual and common goals and relying on the responsibility of the employees are the success factors of organizational culture (Morgan, 1977). According to Krefting and Frost (1985), the way in which organizational culture can influence competitive advantage is by improving and overcoming the limitations of the organization by facilitating individual interaction and/or by limiting the flow of information to certain levels. The accepted values also enable managers to foresee the reaction of employees to certain strategic decisions, which in turn enables them to reduce any undesired consequences (Ogbonna, 1993). Most theoreticians agree that sustainable competitive advantage stems from creating organizational competitiveness which is superior to and can hardly be reached by the competition (Reed and DeFillippi, 1990). Barney (1986) suggested that organizational culture was potentially a source of sustainable

competitive advantage. The unique qualities of a company's organizational culture are a powerful source of generating advantage over its competitors. The link between the leadership style and organizational performance is connected by the nature and form of organizational culture (Ogbonna and Harris, 2000).

In addition to the need to determine the level, one of the greatest problems facing organizational culture in Serbian companies is the fact that the new model of conduct is based on the foundations of old values. This fact is the source of confusing messages, values, and norms and the cause of an unclear perception of the new circumstances and changes (Alam et al., 2010). Therefore, the importance of the changes in relation to the past period is questionable because the environment which is faced with the challenges of the new era is led and directed by outdated and antiquated norms. The need to replace the old with the new is the cause of transition, and one of the goals of privatization is the improvement of the efficiency of the company's business. This can be achieved by changing the values of the employees and managers within an organization. The company must build up a system of values by which it will be recognizable (Khan et al., 2010). Successful managers must influence their employees and then organizational culture integrates the values and attitudes of the employed in the company. Great uncertainty in the life of an organization frequently endangers its achievements (Thompson, 1967). Consequently, one of the frequent topics of organizational research is reducing uncertainty as a means of establishing control over the company's fate (Thompson, 1967). New approaches to organizational culture include changes to the organization in terms of customer relations, quality and innovation, the introduction of an employee reward system and the development of knowledge, skills and abilities which is then harmonized with the adopted concept of change (Liao et al., 2010; Yang and Hsu, 2010).

The research carried out by Hofstede (1980) and his group of collaborators encompassed 40 countries, including the cities of Ljubljana, Zagreb, and Belgrade from the former Yugoslavia. After processing, the data was subsequently checked and tested. This research was refreshed by new data in the year 2001 (Hofstede, 2001). After the disintegration of the Socialist Federal Republic of Yugoslavia, it was possible to separate the results for Slovenia, Croatia, and Serbia.

Hofstede identified the following characteristics of national and regional culture, which directly influence organizational culture (Hofstede, 1980):

1. Power distance: Employees who belong to a culture with a great power distance prefer an authoritative style of leadership. A low distance indicates that all people, all employees should have equal rights..
2. Avoiding uncertainty. Indicates the limit to which a society accepts uncertainty and risk.
3. Individualism or collectivism: The limits to which people

are expected to oppose or behave in a superior manner as members of a group or an organization.
4. Male or female culture. Indicates those cultures based on traditional male or female values. For example, male culture comprises competitiveness, ambition and the accumulation of money and material goods.

Sociologists in Serbia have diagnosed that Serbian national culture is compatible with the picture of national culture which derives from Hofstede's research. These results point towards an unfavourable national cultural business environment basis in Serbia. If we take into consideration that national culture significantly influences organizational culture, it is safe to assume that the organizational culture itself is also at a very low level. Organizational culture research in Serbia is of great significance for the following reasons:

1. A non-stimulating national culture basis.
2. Serbia is a country of great potential which has been grossly neglected during the last two decades.
3. There is a great deal of room in Serbia for foreign investment, as well as the existing significant interest of foreign investors in Serbia.
4. Serbia is a country of great importance for the Southeast European region.

The objective of this research is to establish the impact of organizational culture on business performance. Its importance stems from linking organizational culture with business results. In this way, organizational culture is not only studied by itself, but mathematical dependences between organizational culture and some business effects are also determined. The research was based on Serbian companies.

ORGANIZATIONAL CULTURE AND BUSINESS EFFECTS

Organizational culture influences many aspects of business. This influence can be stronger or weaker, direct or indirect, but it is always positive. Researchers have presented empirical studies to characterize the impact of organizational culture on organizational processes and outcomes, particularly on effectiveness (Carmeli and Tishler, 2004; Denison and Mishra, 1995; Hofstede et al., 1990; Powell and Dent-Micallef, 1997; Yilmaz and Ergun, 2008). In addition to measuring the impact of organizational culture on business effects, there are numerous examples in literature concerning the use of the quantitative approach in researching organizational culture, as well as the measurement of its impact on some aspects of business.

The impact of organizational culture on business effects is the theme of the research explained in the reference (Gordon and DiTomaso, 1992). The main conclusion of this research is that the level of organizational culture

proportionally influences the company's business performance. The reference Van Den Berg and Wilderom, (2004) proposes five dimensions to facilitate the measurement and comparison of organizational culture. Çakar and Ertürk (2010) conducted research into the impact of organizational culture on innovative ability in small and medium-sized companies. In the reference Kavanagh and Ashkanasy (2006) discovered the impact of leadership and management change on organizational culture and employees concerning organizational changes were examined. The reference Scott et al. (2003) studied the possibilities and quantitative methods for measuring organizational culture in medical organizations. Kangas (2009) carried out research into the impact of organizational culture on knowledge management. In the reference Braunscheidel et al. (2010) the impact of organizational culture on supply chain integration was examined and it was confirmed that organizational culture had a significant impact on both internal and external integration practices. In the reference Shieh (2010) it was found that corporate culture showed a significantly positive correlation with supply chain management and organizational innovation. According to Nahm et al. (2003), a high level of organizational culture and customer orientation result in the emergence of a higher level of time-based manufacturing practice and business performances. Matin et al.(2009) pointed to the importance of improving organizational culture in customer-oriented companies and thus increasing customer satisfaction. In the reference (Berson et al., 2008) the bond between the values of the chief executive officer (CEO) and organizational culture was confirmed as well as that between organizational culture and business results. Belassi et al. (2007), discovered the direct impact of organizational culture on new product development (NPD) was asserted. The results from Egan et al. (2004) revealed that organizational learning culture (OLC) had a significant influence on both job satisfaction and motivation. According to Hung et al. (2010), organizational learning culture has a significant impact on business performance. Moreover, organizational learning has a significant impact on the link between a company's dynamic and operational capabilities (Bustinza et al., 2010). The research carried out in five countries (Cseh et al., 2004) showed a moderately significant relationship between socio-cultural values and organizational culture perceptions. In the reference Donate and Guadamillas (2010), the existance of significant bonds among organizational culture, knowledge management, company performance and innovations was confirmed. According to Naor et al. (2010), organizational culture has a more significant influence on manufacturing performance than national culture. This data emphasizes the significance of developing internal organizational culture. The research by Zheng et al. (2010) confirms that knowledge management fully mediates the impact of organizational culture on organizational effectiveness. Gregory et al. (2009) shows how employees' attitudes mediate in the relationship

between organizational culture and organizational effectiveness. The research carried out in six countries (Kwantes and Boglarsky, 2007) stresses the existence of strong bonds between organizational culture and leadership effectiveness and somewhat weaker (but still significant) bonds between organizational culture and personal effectiveness. Organizational culture has a significant impact on buyer-seller relationships (Gyau and Spiller, 2007). According to Škerlavaj et al. (2007), organizational learning culture has a direct, positive impact on non-financial performance, while it has a positive but indirect impact on financial performance. In the reference Stock et al. (2007), it is confirmed that by raising the level of some characteristics of organizational culture, medical error reduction in hospitals may occur. According to Škerlavaj et al. (2010), organizational learning culture has a direct, positive influence on innovations.

Such a large amount of research related to measuring the impact of organizational culture as well as the significance of this issue has resulted in the emergence of numerous methods and instruments used for this purpose. An analysis of these methods was carried out in the relevant literature. For instance, Scott et al. (2003) carried out the systematization of the existing methods. The authors suggested 13 selected methods, giving preference to those that used the quantitative approach and were supported statistically. According to Scott et al. (2003), it was still hard to say which method was the best. In the reference, Van den Berg and Wilderom, (2004), the stress was on establishing a unique method for measuring organizational culture. However, the authors stated that a consensus had not been reached on this issue. In the reference Jung et al. (2009), 70 instruments for researching organizational culture were identified but it was concluded that there was no ideal instrument for this purpose. The majority of these 70 methods (48 of them) were reduced to psychometric evaluation. The following statistical methods were used most frequently: factor analysis, multivariate regression and correlation, path analysis, structural Equation Modelling (SEM) and similar. In the reference Jung et al. (2009), they added that some countries had defined questionnaires for measuring organizational culture. Moreover, there are some specialized instruments for measuring organizational culture in some industrial branches, for example, in the hospitality industry (Dawson et al., article in press) and the fitness industry (MacIntosh and Doherty, 2010) that can be found in the literature.

In this paper, research in the impact of organizational culture on some economic indices was carried out by using the following statistical methods: factor analysis, multivariate regression and correlation. As previously mentioned, these two methods are often used in examining the impact of organizational culture on certain business aspects which may be seen in the numerous references, for example, Wilderom and Van den Berg, (1999); Den Hartog and Verburg, (2004); MacIntosh and

Doherty (2010) and Lukášová et al. (2006). The following part of the paper presents the applied methodology and the research results as well as their analysis.

RESEARCH METHODOLOGY

In order to determine and mathematically describe the impact of organizational culture on business effects, it was necessary, first of all, to define the following:

1. The representatives of organizational culture in Serbian companies: These are the values which represent organizational culture and which are later measured and related to business effects.
2. The representatives of business effects: Their values are determined depending on the values of organizational culture. Economic indices are taken as the representatives of business effects.

According to the aforementioned factors, the research methodology is outlined in three stages and several sub-stages:

1. Determination of the representatives of organizational culture.

i. Defining the parameters of organizational culture.
ii. A poll on the significance of the defined parameters of organizational culture (Poll 1).
iii. The use of factor analysis - in order to determine the key factors (representatives) of organizational culture.

2. Determination of the representatives of business effects.
3. Determination of the impact and dependence of the representatives of organizational culture and business effects.

i. A poll on the state of the representatives of organizational culture and business effects (Poll 2).
ii. Multivariate regression and correlation with the aim of the final determination of the dependence of organizational culture and business effects.

Determination of the representatives of organizational culture

The determination of the representatives of organizational culture represents the first stage of the research. The first stage was realized in the previous research and the results were published in the reference (Nikolić et al., 2009). Here, only the final results are presented. The final results of the first stage represent the starting point for further research, that is, the theme of this paper.

Factor analysis was applied in order to determine the key factors of organizational culture in Serbian companies. Factor analysis was performed on the results of Poll 1 on the basis of 72 defined parameters of organizational culture. The factor selection was made according to the Kaiser-Guttman criterion on the basis of which 7 factors of organizational culture in Serbian companies were identified. These factors cover more than 71% of organizational culture parameter variation.

According to Nikolić et al. (2009), the factors of organizational culture, which are most important for Serbian companies, were defined in the following way:

F1: OC_1 – Position and perspectives of the company's employees.
F2: OC_2 – Recognisability of the symbols of organizational culture in the company.
F3: OC_3 – Orientation of the company to strategic aspects of doing business.
F4: OC_4 – Quality of communication and information flow in the company.

Table 1. Questionnaire contents for examining the influence of organizational culture on economic indicators.

Sign	Key factors of organizational culture (OC)	Evaluation of the current state of the organizational culture factor				
OC_1	Position and perspectives of the company's employees	1	2	3	4	5
OC_2	Recognisability of the symbols of organizational culture in the company	1	2	3	4	5
OC_3	Orientation of the company to strategic aspects of doing business	1	2	3	4	5
OC_4	Quality of communication and information flow in the company	1	2	3	4	5
OC_5	Quality of internal relationships in the company and employee motivation	1	2	3	4	5
OC_6	Aspirations of the company towards originality and customer satisfaction	1	2	3	4	5
OC_7	Quality of the employees' established norms of business conduct	1	2	3	4	5
Sign	**Economic indices (EI)**	**Evaluation of the current state of economic indices**				
EI_1	Share of salaries in business revenues	1	2	3	4	5
EI_2	Company productivity	1	2	3	4	5
EI_3	Production economy	1	2	3	4	5
EI_4	Business profitability	1	2	3	4	5
EI_5	Company's liquidity	1	2	3	4	5
EI_6	Profit margin (profit share in business revenues)	1	2	3	4	5
EI_7	Potential financial risks (exchange rate fluctuations, high interest rates and the like)	1	2	3	4	5

F5: OC_5 – Quality of internal relationships in the company and employee motivation.
F6: OC_6 – Aspirations of the company towards originality and customer satisfaction.
F7: OC_7 – Quality of the employees' established norms of business conduct.

Determination of the representatives of business effects

Economic indices are taken as the representatives of business effects. The following seven economic indices have been analyzed:

EI_1 - Share of salaries in business revenues
EI_2 - Company productivity
EI_3 - Production economy
EI_4 - Business profitability
EI_5 - Company's liquidity
EI_6 - Profit margin (profit share in business revenues)
EI_7 - Potential financial risks (exchange rate fluctuations, high interest rates and the like)

Determination of dependence between organizational culture and business effects

The poll on the state of the representatives of organizational culture and business effects (Poll 2)

The previously defined key factors of organizational culture in Serbian companies can be used to establish the impact of organizational culture on business effects (economic indices).
Firstly, a questionnaire, as shown in Table 1, was compiled. Table 1 presents the key factors of organizational culture in Serbian companies, as well as the economic indices of interest. Then, the polling of the required number of managers was carried out in Serbian companies. The managers were expected to assign values to each factor by awarding marks from 1-5. The mark should

sent the level of the current state of the examined factor (indicator) in their company. The marks have the following meaning: 1 – Highly unfavourable, 2 - Unfavourable, 3 - Average, 4 - Favourable, 5 – Very favourable. A similar approach to the assessment of organizational culture parameters has been applied in previous research (Veiga et al., 2000).

The basic characteristics of the polling process and results for Poll 2 are:

1. Number of managers: A total of 100 managers from 100 companies answered the questions.
2. Respondents (managers): The respondents are people in senior managerial positions in their respective companies and those who have considerable insight into the company's strategy, the relationships within the company, etc. The contacted managers can be said to be the most competent people in the companies included in Poll 2.
3. Type of company: The research was carried out in Serbian companies, regardless of the business branch or form of property within the company. The sample was selected to represent public and private enterprises. Smaller companies, with fewer than 20 employees, were not included in the research. The reason behind that is the significant and direct influence of the smaller enterprise owners' personal traits and preferences on the organizational structure, while the larger enterprises are less susceptible to such influences. The goal was to obtain results as independent as possible of the owner's personal traits.
4. Research area in terms of geography: The research was conducted on the territory of Serbia.
5. Research period: The research lasted for about 5 months in the period between April and September, 2010.

Determination of dependence between organizational culture and business effects

After polling (Poll 2), statistical analysis was carried out on the

Table 2. Dependences EI_1 - Share of salaries in business revenues – from organizational culture.

Effect	EI_1 Param.	EI_1 Std.Err	EI t	EI_1 p	-95.00% Cnf.Lmt	+95.00% Cnf.Lmt	EI_1 Beta (ß)	EI_1 St.Err.ß	-95.00% Cnf.Lmt	+95.00% Cnf.Lmt
Intercept	**1.402**	**0.423**	**3.313**	**0.001**	**0.562**	**2.243**				
OC_1	0.042	0.131	0.320	0.750	-0.218	0.301	0.046	0.143	-0.238	0.329
OC_2	0.004	0.141	0.027	0.979	-0.276	0.283	0.004	0.139	-0.273	0.280
OC_3	**0.452**	**0.110**	**4.092**	**0.000**	**0.233**	**0.671**	**0.483**	**0.118**	**0.248**	**0.717**
OC_4	0.077	0.111	0.693	0.490	-0.143	0.297	0.081	0.117	-0.152	0.315
OC_5	0.053	0.114	0.465	0.643	-0.173	0.279	0.053	0.114	-0.173	0.278
OC_6	-0.059	0.103	-0.572	0.569	-0.264	0.146	-0.060	0.105	-0.269	0.149
OC_7	0.034	0.112	0.302	0.764	-0.188	0.255	0.035	0.117	-0.197	0.268

From Table 2, the following dependences are observed: Parameter a = 1.402 shows the theoretical value EI_1 when the value of all OC is equal to zero; Coefficient b_1 = 0.042 shows how many units EI_1 is increased by if OC_1 is increased by one unit; Coefficient b_2 = 0.004 shows how many units EI_1 is increased by if OC_2 is increased by one unit; Coefficient b_3 = 0.452 shows how many units EI_1 is increased by if OC_3 is increased by one unit; Coefficient b_4 = 0.077 shows how many units EI_1 is increased by if OC_4 is increased by one unit; Coefficient b_5 = 0.053 shows how many units EI_1 is increased by if OC_5 is increased by one unit; Coefficient b_6 = - 0.0592 shows how many units EI_1 is decreased by if OC_6 is increased by one unit; Coefficient b_7 = 0.034 shows how many units EI_1 is increased by if OC_7 is increased by one unit.

Table 3. Testing dependence EI_1 - Share of salaries in business revenues – from organizational culture.

Depend. Variable	Multiple R	Multiple R^2	Adjusted R^2	SS Model	df Model	MS Model	SS Residual	df Residual	MS Residual	F	p
EI_1	0.581	0.338	0.288	39.470	7.000	5.639	77.280	92.000	0.840	6.713	0.000

Table 4. Dependence EI_2 - Company productivity – from organizational culture.

Effect	EI_2 Param.	EI_2 Std.Err	EI_2 t	EI_2 p	-95.00% Cnf.Lmt	+95.00% Cnf.Lmt	EI_2 Beta (ß)	EI_2 St.Err.ß	-95.00% Cnf.Lmt	+95.00% Cnf.Lmt
Intercept	**0.997**	**0.354**	**2.816**	**0.006**	**0.294**	**1.700**				
OC_1	**0.240**	**0.109**	**2.193**	**0.031**	**0.023**	**0.457**	**0.263**	**0.120**	**0.025**	**0.501**
OC_2	-0.196	0.118	-1.667	0.099	-0.430	0.038	-0.195	0.117	-0.428	0.037
OC_3	**0.197**	**0.092**	**2.137**	**0.035**	**0.014**	**0.381**	**0.212**	**0.099**	**0.015**	**0.409**
OC_4	**0.298**	**0.093**	**3.208**	**0.002**	**0.113**	**0.482**	**0.317**	**0.099**	**0.121**	**0.513**
OC_5	**-0.227**	**0.095**	**-2.376**	**0.020**	**-0.416**	**-0.037**	**-0.227**	**0.095**	**-0.416**	**-0.037**
OC_6	0.170	0.086	1.970	0.052	-0.001	0.342	0.174	0.089	-0.001	0.350
OC_7	**0.258**	**0.093**	**2.762**	**0.007**	**0.072**	**0.443**	**0.272**	**0.098**	**0.076**	**0.467**

collected data. Multivariant regression and correlation were used to establish the interdependence of organizational culture and business effects. The influences on each economic indicator were determined separately.

The results of the statistical analysis are presented in the following tables (Table 2 to Table 15). The bold values in the tables point at statistically significant coefficients.

In Table 3, the corrected determination index $R^2 = 0.2877$ is observed. This index shows how the percentage of the variable's variability EP_1 is explained by variances in variables OC_1 to OC_7. Such descriptions and testing of dependences are also valid for the following tables (Table 4 to Table 15).

Table 16 presents the correlations of all key factors concerning organizational culture and all analyzed economic indices. The bold values are statistically significant in the basic set. The following is valid for these values: the values obtained on the basis of the sample are equal to those in the whole basic set, or outside the sample. In Table 16 almost all values are significant. The strongest relations are in the grey fields.

Table 16 gives the linear coefficients of the correlation, which show how strong the relation between some variables are. The explanation of the coefficient is:

$r < 0.5$ weak relation,
$0.5 \leq r < 0.7$ significant relation,
$0.7 \leq r < 0.9$ strong relation,
$0.9 \leq r$ very strong relation.

RESEARCH RESULTS AND THEIR ANALYSES

EI_1 - Share of salaries in business revenues

Table 2 shows that economic index EI_1 - Share of salaries in business revenues is significantly influenced by factor OC_3. At the same time, on the basis of Table 2, the multivariate regression dependence model can be set concerning the impact of organizational culture on economic index EI_1, in the following form:

$$\hat{Y} (EI_1) = 1.4022 + 0.0418 \cdot OC_1 + 0.00376 \cdot OC_2 + 0.4520 \cdot OC_3 + 0.0769 \cdot OC_4 + $$
$$+ 0.0530 \cdot OC_5 - 0.0591 \cdot OC_6 + 0.0336 \cdot OC_7, \quad (1)$$

where the values OC_1 to OC_7 are in the interval [1, 5].

Equation (1) points to the negative impact of factor OC_6 on economic index EI_1.

In Table 3, the corrected index of determination can be noticed (in this case, it is $R^2 = 0.2877$). This value explains the percentage of the variability of EI_1 which is explained by the variabilities of OC_1 to OC_7. In other words, this means that the impact of organizational culture on the variability of economic index EI_1 is 28.77 %, while the residue is made up of the impact of other factors and coincidences.

EI_2 - Company productivity

Table 4 shows that economic index EI_2 – Company productivity is statistically significantly influenced by

factors OC_1, OC_3, OC_4, OC_5 (negative impact) and OC_7. On the basis of Table 4, the multivariate regression dependence model can be set concerning the impact of organizational culture on economic index EI_2, in the following form:

$$\hat{Y} (EI_2) = 0.9970 + 0.2396 \cdot OC_1 - 0.1960 \cdot OC_2 + 0.1975 \cdot OC_3 + 0.2977 \cdot OC_4 -$$
$$- 0.2266 \cdot OC_5 + 0.1702 \cdot OC_6 + 0.2576 \cdot OC_7$$
$$(2)$$

Where the values OC_1 to OC_7 are in the interval [1, 5].

Equation (2) shows the negative impact of factors OC_2 and OC_5 on economic index EI_2.

In Table 5, the corrected index of determination can be noticed (in this case, it is $R^2 = 0.4967$). This value explains the percentage of the variability of EI_2 which is explained by the variabilities of OC_1 to OC_7. In other words, this means that the impact of organizational culture on the variability of economic index EI_2 is 49.67 %, while the residue consists of the impact of other factors and coincidences.

EI_3 - Production economy

Table 6 shows that economic index EI_3 - Production economy is statistically significantly influenced by factors OC_2, OC_6 and OC_7. On the basis of Table 6, the multivariate regression dependence model can be set concerning the impact of organizational culture on economic index EI_3, in the following form:

$$\hat{Y} (EI_3) = 0.8212 + 0.0963 \cdot OC_1 + 0.2836 \cdot OC_2 - 0.1500 \cdot OC_3 + 0.0111 \cdot OC_4 +$$
$$+ 0.0415 \cdot OC_5 + 0.2415 \cdot OC_6 + 0.2614 \cdot OC_7$$
$$(3)$$

Where the values OC_1 to OC_7 are in the interval [1, 5]

Equation (3) demonstrates the negative impact of factor OC_3 on economic index EI_3.

In Table 7, the corrected index of determination can be noticed (in this case, it is $R^2 = 0.4095$). This value explains the percentage of the variability of EI_3 which is explained by the variabilities of OC_1 to OC_7. In other words, this means that the impact of organizational culture on the variability of economic index EI_3 is 40.95 %, while the residue is made up of the impact of other factors and coincidences.

EI_4 - Business profitability

Table 8 shows that economic index EI_4 - Business profitability is significantly influenced by factor OC_7. At the same time, on the basis of Table 8, the multivariate

Table 5. Testing of dependence EI_2 - Company productivity – from organizational culture.

Depend. Variable	Test of SS Whole Model vs. SS Residual (Spreadsheet3)										
	Multiple R	Multiple R^2	Adjusted R^2	SS Model	df Model	MS Model	SS Residual	df Residual	MS Residual	F	p
EI_2	0.730	0.532	0.497	61.507	7.000	8.787	54.053	92.000	0.588	14.955	0.000

Table 6. Dependence EI_3 - Production economy – from organizational culture.

Effect	Parameter Estimates (Spreadsheet3) Sigma-restricted parameterization									
	EI_3 Param.	EI_3 Std.Err	EI_3 t	EI_3 p	-95.00% Cnf.Lmt	+95.00% Cnf.Lmt	EI_3 Beta (ß)	EI_3 St.Err.ß	-95.00% Cnf.Lmt	+95.00% Cnf.Lmt
Intercept	**0.821**	**0.383**	**2.142**	**0.035**	**0.060**	**1.583**				
OC_1	0.096	0.118	0.814	0.418	-0.139	0.331	0.106	0.130	-0.152	0.364
OC_2	**0.284**	**0.127**	**2.226**	**0.028**	**0.031**	**0.537**	**0.282**	**0.127**	**0.030**	**0.534**
OC_3	-0.150	0.100	-1.499	0.137	-0.349	0.049	-0.161	0.107	-0.374	0.052
OC_4	0.011	0.101	0.111	0.912	-0.188	0.211	0.012	0.107	-0.201	0.224
OC_5	0.041	0.103	0.401	0.689	-0.164	0.247	0.042	0.103	-0.164	0.247
OC_6	**0.242**	**0.094**	**2.582**	**0.011**	**0.056**	**0.427**	**0.248**	**0.096**	**0.057**	**0.438**
OC_7	**0.261**	**0.101**	**2.588**	**0.011**	**0.061**	**0.462**	0.276	0.107	0.064	0.488

Table 7. Testing dependence EI_3 - Production economy – from organizational culture.

Depend. Variable	Test of SS Whole Model vs. SS Residual (Spreadsheet3)										
	Multiple R	Multiple R^2	Adjusted R^2	SS Model	df Model	MS Model	SS Residual	df Residual	MS Residual	F	p
EI_3	0.672	0.451	0.409	52.143	7.000	7.449	63.417	92.000	0.689	10.806	0.000

the multivariate regression dependence model can be set concerning the impact of organizational culture on economic index EI_4, in the following form:

$$\hat{Y}(EI_4) = 1.6142 + 0.1556 \cdot OC_1 + 0.1809 \cdot OC_2 + 0.0637 \cdot OC_3 - 0.1409 \cdot OC_4 + + 0.0226 \cdot OC_5 + 0.0661 \cdot OC_6 + 0.2572 \cdot OC_7 \quad (4)$$

Where the values OC_1 to OC_7 are in the interval

[1, 5]

Equation (4) points out the negative impact of factor OC_4 on economic index EI_4.

In Table 9, the corrected index of determination can be noticed (in this case, it is $R^2 = 0.3134$). This value explains the percentage of the variability of EI_4 which is explained by the variabilities of OC_1 to OC_7. This means that the impact of organizational culture on the variability of economic index

EI_4 is 31.34 %, while the residue is made up of the impact of other factors and coincidences.

EI_5 - Company's liquidity

Table 10 shows that economic index EI_5 - Company's liquidity is significantly influenced by factor OC_5. At the same time, on the basis of Table 10, the multivariate regression dependence

Table 8. Dependence EI_4 - Business profitability – from organizational culture.

Effect	Parameter Estimates (Spreadsheet3) Sigma-restricted parameterization
	EI_4 Param.	EI_4 Std.Err	EI_4 t	EI_4 p	-95.00% Cnf.Lmt	+95.00% Cnf.Lmt	EI_4 Beta (β)	EI_4 St.Err.β	-95.00% Cnf.Lmt	+95.00% Cnf.Lmt
Intercept	1.614	0.376	4.290	0.000	0.867	2.361				
OC_1	0.156	0.116	1.339	0.184	-0.075	0.386	0.188	0.140	-0.091	0.466
OC_2	0.181	0.125	1.447	0.151	-0.067	0.429	0.198	0.137	-0.074	0.469
OC_3	0.064	0.098	0.648	0.518	-0.131	0.259	0.075	0.116	-0.155	0.305
OC_4	-0.141	0.099	-1.429	0.156	-0.337	0.055	-0.165	0.115	-0.394	0.064
OC_5	0.023	0.101	0.223	0.824	-0.179	0.224	0.025	0.111	-0.197	0.246
OC_6	0.066	0.092	0.720	0.473	-0.116	0.248	0.074	0.103	-0.131	0.280
OC_7	**0.257**	**0.099**	**2.595**	**0.011**	**0.060**	**0.454**	**0.298**	**0.115**	**0.070**	**0.527**

Table 9. Testing dependence EI_4 - Business profitability – from organizational culture.

Depend. Variable	Test of SS Whole Model vs. SS Residual (Spreadsheet3)
	Multiple R	Multiple R2	Adjusted R2	SS Model	df Model	MS Model	SS Residual	df Residual	MS Residual	F	p
EI_4	0.602	0.362	0.313	34.644	7.000	4.949	61.066	92.000	0.664	7.456	0.000

model can be set concerning the impact of organizational culture on economic index EI_5, in the following form:

$$\hat{Y}\,(EI_5) = 1.3200 + 0.1734 \cdot OC_1 + 0.0189 \cdot OC_2 + 0.1233 \cdot OC_3 - 0.1031 \cdot OC_4 + + 0.2166 \cdot OC_5 + 0.1312 \cdot OC_6 + 0.1211 \cdot OC_7 \quad (5)$$

Where the values OC_1 to OC_7 are in the interval [1, 5]

Equation (5) demonstrates the negative impact of factor OC_4 on economic index EI_5.
In Table 11, the corrected index of determination can be noticed (in this case, it is R^2 = 0.3188).

This value explains the percentage of the variability of EI_5 which is explained by the variabilities of OC_1 to OC_7. This means that the impact of organizational culture on the variability of economic index EI_5 is 31.88 %, while the residue consists of the impact of other factors and coincidences.

EI_6 - Profit margin (profit share in business revenues)

Table 12 shows that economic index EI_6 - Profit margin (profit share in business revenues) is significantly influenced by factor OC_6. At the same time, on the basis of Table 12, the multivariate

regression dependence model can be set concerning the impact of organizational culture on economic index EI_6, in the following form:

$$\hat{Y}\,(EI_6) = 0.8743 + 0.2172 \cdot OC_1 - 0.0672 \cdot OC_2 + 0.0576 \cdot OC_3 + 0.1293 \cdot OC_4 - - 0.0690 \cdot OC_5 + 0.2664 \cdot OC_6 + 0.1990 \cdot OC_7, \quad (6)$$

Where the values OC_1 to OC_7 are in the interval [1, 5]

Equation (6) points out the negative impact of factors OC_2 and OC_5 on economic index EI_5.
In Table 13, the corrected index of determination can be noticed (in this case, it is R^2 = 0.3817). This value explains the percentage of the

Table 11. Testing dependence EI_5 - Company's liquidity – from organizational culture.

Depend. Variable	Test of SS Whole Model vs. SS Residual (Spreadsheet3)										
	Multiple R	Multiple R^2	Adjusted R^2	SS Model	df Model	MS Model	SS Residual	df Residual	MS Residual	F	p
EI_5	0.606	0.367	0.319	39.353	7.000	5.622	67.887	92.000	0.738	7.619	0.000

Table 12. Dependence EI_6 - Profit margin (profit share in business revenues) – from organizational culture.

Effect	Parameter estimates (Spreadsheet3) Sigma-restricted parameterization									
	EI_6 Param.	EI_6 Std.Err	EI_6 t	EI_6 p	-95.00% Cnf.Lmt	+95.00% Cnf.Lmt	EI_6 Beta (ß)	EI_6 St.Err.ß	-95.00% Cnf.Lmt	+95.00% Cnf.Lmt
Intercept	**0.874**	**0.381**	**2.294**	**0.024**	**0.117**	**1.631**				
OC_1	0.217	0.118	1.847	0.068	-0.016	0.451	0.246	0.133	-0.019	0.510
OC_2	-0.067	0.127	-0.531	0.597	-0.319	0.184	-0.069	0.130	-0.327	0.189
OC_3	0.058	0.099	0.579	0.564	-0.140	0.255	0.064	0.110	-0.155	0.282
OC_4	0.129	0.100	1.295	0.199	-0.069	0.328	0.142	0.109	-0.076	0.359
OC_5	-0.069	0.103	-0.672	0.503	-0.273	0.135	-0.071	0.106	-0.281	0.139
OC_6	**0.266**	**0.093**	**2.866**	**0.005**	**0.082**	**0.451**	**0.281**	**0.098**	**0.086**	**0.476**
OC_7	0.199	0.100	1.983	0.050	-0.000	0.398	0.216	0.109	-0.000	0.433

variability of EI_6 which is explained by the variabilities of OC_1 to OC_7. This means that the impact of organizational culture on the variability of economic index EI_6 is 38.17 %, while the residue is made up of the impact of other factors and coincidences.

EI_7 - Potential financial risks (exchange rate fluctuations, high interest rates and the like)

Table 14 shows that economic index EI_7 - Potential financial risks is significantly influenced by factor OC_7. At the same time, on the basis of Table 14, the multivariate regression dependence model can be set concerning the impact of organizational culture on economic index EI_7, in the following form:

$$\hat{Y}(EI_7) = 1.1655 + 0.0003 \cdot OC_1 + 0.2224 \cdot OC_2 + 0.0440 \cdot OC_3 - 0.1242 \cdot OC_4 + + 0.1844 \cdot OC_5 + 0.0599 \cdot OC_6 + 0.2831 \cdot OC_7 \quad (7)$$

Where the values OC_1 to OC_7 are in the interval [1, 5]

Equation (7) demonstrates the negative impact of factor OC_4 on economic index EI_7.

In Table 15, the corrected index of determination can be noticed (in this case, it is $R^2 = 0.2266$).

This value explains the percentage of the variability of EI_7 which is explained by the variabilities of OC_1 to OC_7. In other words, this means that the impact of organizational culture on the variability of economic index EI_7 is 22.66 %, while the residue is made up of the impact of other factors and coincidences.

The analysis of the correlations concerning the key factors of organizational culture and the analyzed economic indices

Based on Table 16, the following strongest relations among the variabilities can be noticed:

Table 13. Testing dependence EI_6 - Profit margin (profit share in business revenues) – from organizational culture.

Depend. Variable	Multiple R	Multiple R^2	Adjusted R^2	SS Model	df Model	MS Model	SS Residual	df Residual	MS Residual	F	p
				Test of SS Whole Model vs. SS Residual (Spreadsheet3)							
EI_6	0.652	0.425	0.382	46.365	7.000	6.624	62.625	92.000	0.681	9.730	0.000

Table 14. Dependence EI_7 - Potential financial risks (exchange rate fluctuations, high interest rates and the like) from organizational culture.

Effect	EI_7 Param.	EI_7 Std.Err	EI_7 t	EI_7 p	-95.00% Cnf.Lmt	+95.00% Cnf.Lmt	EI_7 Beta (ß)	EI_7 St.Err.ß	-95.00% Cnf.Lmt	+95.00% Cnf.Lmt
				Parameter estimates (Spreadsheet3) Sigma-restricted parameterization						
Intercept	**1.166**	**0.490**	**2.376**	**0.020**	**0.191**	**2.140**				
OC_1	0.000	0.151	0.002	0.999	-0.300	0.301	0.000	0.149	-0.295	0.296
OC_2	0.222	0.163	1.365	0.176	-0.101	0.546	0.198	0.145	-0.090	0.486
OC_3	0.044	0.128	0.344	0.732	-0.210	0.298	0.042	0.123	-0.202	0.286
OC_4	-0.124	0.129	-0.966	0.337	-0.380	0.131	-0.118	0.122	-0.361	0.125
OC_5	0.184	0.132	1.396	0.166	-0.078	0.447	0.165	0.118	-0.070	0.400
OC_6	0.060	0.120	0.501	0.618	-0.178	0.298	0.055	0.110	-0.163	0.273
OC_7	**0.283**	**0.129**	**2.191**	**0.031**	**0.026**	**0.540**	**0.267**	**0.122**	**0.025**	**0.510**

Table 15. Testing dependence EI_7 - Potential financial risks (exchange rate fluctuations, high interest rates and the like) – from organizational culture.

Depend. Variable	Multiple R	Multiple R^2	Adjusted R^2	SS Model	df Model	MS Model	SS Residual	df Residual	MS Residual	F	p
				Test of SS Whole Model vs. SS Residual (Spreadsheet3)							
EI_7	0.530	0.281	0.227	40.610	7.000	5.801	103.750	92.000	1.128	5.144	0.000

1. EI_2 and OC_4 (0.59)
2. EI_1 and OC_3 (0.57)
3. EI_2 and OC_1 (0.55)
4. EI_3 and OC_2 (0.55)
5. EI_3 and OC_7 (0.55)

Based on Table 16, the weakest relations are among the following variabilities:

1. EI_7 and OC_4 (0.21)
2. EI_2 and OC_5 (0.23)

3. EI_1 and OC_6 (0.26)
4. EI_5 and OC_4 (0.27)
5. EI_4 and OC_4 (0.28)

In addition, Table 16 shows that the variabilities

Table 16. Correlations of the key factors of organizational culture and the analyzed economic indices.

Variable	Correlations (Spreadsheet3) Marked correlations are significant at p < .01000 N = 100 (Casewise deletion of missing data)						
	OC_1	OC_2	OC_3	OC_4	OC_5	OC_6	OC_7
EI_1	0.41	0.39	**0.57**	**0.36**	0.33	0.26	0.34
EI_2	**0.55**	0.41	**0.53**	**0.59**	0.23	0.46	**0.52**
EI_3	**0.50**	**0.55**	0.36	0.39	0.43	**0.51**	**0.55**
EI_4	0.47	0.48	0.43	0.28	0.41	0.40	0.51
EI_5	0.47	0.43	0.46	0.27	**0.50**	0.43	0.46
EI_6	**0.52**	0.44	0.45	0.46	0.33	**0.52**	0.51
EI_7	0.34	0.40	0.35	0.21	0.43	0.33	0.46

EI_2 and EI_3 have the strongest relation with organizational culture and that OC_1 and OC_7 have the strongest relation with business results.

Conclusion

The applied research methodology proved to be successful in examining the impact of organizational culture on business effects. This research confirmed a strong relation between organizational culture and business effects. The obtained dependences show that by increasing the level of organizational culture the economic indices in companies also improve. The results of the factor analysis can be summed up in the following ways:

1. 7 key factors of organizational culture which realistically represent the state of organizational culture in Serbian companies are defined.
2. The factors of organizational culture which have the strongest impact on economic indices are determined.
3. The set multivariate regression models enable the calculation of the values of some economic indices, depending on the value and level of the key factors concerning organizational culture in companies.
4. By using the corrected determination indices the impact (in percentage) of organizational culture on some economic indices was determined.
5. Based on the correlation value, the following strongest relations among the analyzed variabilities can be noticed.

The possibilities for the implementation of the obtained results, as well as their practical significance are as follows:

1. Developing managers' consciousness – showing them that the development and increase of organizational culture contribute to better business effects.
2. The operative use of the key factors of organizational culture facilitates the measurement, monitoring and improvement of organizational culture itself in Serbian companies.

3. On the basis of the set influences, it is possible, by using appropriate activities oriented at increasing the level of a specific organizational culture segment, to increase the level of strictly determined economic indices.
4. The set multivariate regression models enable managers to achieve a rapid, efficient and qualitative review of the current state of economic indices, as well as the simulation of the possible, future state of economic indices. In this way, the effective selection of future activities aimed at increasing the level of organizational culture is secured. These activities will contribute to improved business results.
5. Through the implementation of the previously mentioned measures the level of economic indices and the effects of business are increased.

The limitations of this research lie, firstly, in the fact that the results are applicable only in Serbian companies. The results may also be used in some transitional countries. It is also possible to expand the research to some other country or to repeat the same research in Serbia, in some other time period and by using some other parameters. Moreover, an important direction of future research may be the application of the same methodology in researching some other business processes and their impact on business effects.

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