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ORGANIZACIJA

Organizacija (Journal of Management, Informatics and Human Resources) is an interdisciplinary peer-reviewed journal which is open to contributions of high quality, from any perspective relevant to the organizational phenomena.

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- podjetniški inženiring (npr. organizacijsko oblikovanje, upravljanje poslovnih procesov, paradigme preoblikovanja podjetij itd.);
- članki, ki analizirajo organizacijsko uspešnost in prizadevanja za izboljšanje le-te.

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The Relationship between Control over a Deal and Cognitive-Based Trust in an International Business Partnership

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Background and purpose: Trust is embedded into the national culture. It is a tool that helps create strategic partnerships and facilitates deals that carry certain risks. Cultural differences and norms can affect business relations, but more often focus is on the obvious differences. Although trust in a business partner may be due to non-obvious differences, for example, which part of the deal the partner wants to control himself and which part of the deal he wants to give to the partner to control. If the difference between the real and desired levels of the partner's control over the deal is large, then is trust possible, especially in intercultural business relations?

Objective: One aim of our study is to find out whether trust may be considered as moderator of control in a business deal. In other words, if the level of trust in a business partner is higher, are the partners more open to sharing their control over the deal with each other? The other aim is to identify the links between these indicators (trust and control) in business partnerships of partners from different cultures.

Design/Methodology/Approach: The study investigated the answers of 103 Slovenian and 124 Russian business partners. The Organizational Trust Inventory (OTI) and the 5-items questionnaire on control over deal were used to collect data. Descriptive and inferential statistics were used to process the data collected.

Results: The probability that the business partner will not fulfil their obligations in the deal negatively relates to the level of trust. The difference between degree of desired control and degree of control negatively relates to the level of trust.

Conclusion: As our results showed, trust cannot be considered as a strong moderator of control between partners. In response to greater trust, the respondents only agree to increase their partner's control, but are not willing to reduce their own. Moreover, this finding is stronger in the group of Russian partners than in the Slovenian ones.

Keywords: *Trust, Business Relationships, Business Partner, Control Over Deal, Obligations, Slovenia, Russia*

1 Introduction

Trust is a tool that helps create strategic partnerships and facilitates deals that carry certain risks. Therefore, it gains a more and more popularity form of collaborative capital (Jost, Dawson, & Shaw, 2005), and the greater is the level of uncertainty, the trust is greater needed. Through the processes of economic globalization, the principle of interaction between independent economic entities: "We

will win more together" has emerged (Smolyar, 2017). As a result, the trust between business partners becomes crucial and is particularly acute in relations in small and medium businesses.

This study was motivated by a desire to study the factors that influence the degree of control over cross-cultural deals between foreign business partners, when different levels of trust exist between the partners. Examining these factors is crucial, because prior research suggests that con-

trol and trust allow businesses to overcome such obstacles as uncertainty and interdependency in business relations (e.g. Mohr & Puck, 2010).

Trust was studied across cultures (e.g. Fukuyama, 1995) and the researchers found several associations between trust and cultural differences. Demographic differences, in particular nationality, are the reason for lowering the level of trust in international communications (Glaeser, Laibson, Scheinkman, & Soutter, 2000). Trust is threatened by disparate understandings (Berge, 2018) and it operates at multiple levels to predict members' performance regarding the generation of income from business referrals (Becerra, Lunnan, & Huemer, 2008; Gupta, Ho, Pollack, & Lai, 2016). As Svensson (2001) argued, to truly understand the trust between two actors (in a marketing channel) beyond the dyadic business relationship, a generic model of the synchronized trust chain concept should be used. Shazi, Gillespie, and Steen (2015) underlined, that trust is implied to have a greater role when organizational borders are greater.

Actually, the problem today is that relations between states lead to decisions that affect the economic interaction and development of international business partnership. On the one hand, there is the issue of the crisis of trust between Russian and European business partners in the situation of economic sanctions aimed at Russia. On the other hand, for the past 30 years (known as the perestroika period), Russians have lived in a situation of extreme instability of value orientations, which has led to the confrontation between two business cultures – a culture that inherited the Soviet management practices and a culture built on the European model of management and cooperation (Sinchuk, 2016). That is why the identification of dependencies of the state of trust in international business, as well as the study of the factors of building trust in the international business environment after perestroika is relevant (Baykov, 2018).

External constraints affect organizations whose survival largely depends on the environment (Pfeffer & Salancik, 2003). However, if organizations can try to change their environment politically, entrepreneurs can only influence partnerships to control or absorb uncertainty about the transaction. At the same time, partners from different countries find themselves in different conditions. Those who came to the country to develop their business here get more risks and uncertainties than those who live in this country, are well aware and adapted to the environment. Thus, the views of entrepreneurs on a deal with a partner from another country are determined by culture, social experience, and whether the deal is in a new or habitual business environment. These factors set the level of uncertainty in the search for a balance between trust in the partner and control over their deal.

Our interest was to compare two countries from the same region with similar but different cultural roots – Russians and Slovenians are united by common Slavic roots,

there is a common language culture and in many ways behaviour – that cooperate intensively in the business field; comparing the foreign trade of the two countries, the number of importers and exporters in the Russian Federation and Slovenia has increased in the last ten years, from 441 Slovenian exporters to the Russian Federation in 2008 to 599 in 2016, and from 198 Russian exporters to Slovenia in 2008 to 301 in 2016 (SURS, 2018). Nevertheless, only a few studies concerning Russian-Slovenian partnerships have been published, and most focus on social and cultural differences between Slovenians and Russians (e.g., Pajnkihar, Vrbnjak, Kasimovskaya, Watson, & Stiglic, 2019), rather than the features of their collaboration. We believe that with such a comparison group it is possible to single out the most significant regularities, since only the most significant differences can appear on closed samples in different parameters.

In the current study we examine trust in business partnerships as a predictor, and in line with Das and Teng (2002), we consider control over a deal as a regulatory process made the partner's pursuit of mutually compatible interests more predictable. Following Stroh and Balakshin (2015), we consider a business partnership as a social interaction of economically independent subjects, and as efforts of business partners to achieve their joint business interests. The main idea of our study is to reveal the relationship between trust and its consequences - an assessment of the probability that the partner will not fulfil the obligations of the deal and dimensions of control over the deal. The aim of the study is to identify the links between these indicators in a business partnership with partners from two cultures.

2 Theoretical Framework and Hypotheses

2.1 Cognitive- and affect-based Trust

In business relationships trust was studied as a predictor, e.g. in a team's activity (Schaubroeck, Lam, & Peng, 2011), as moderator of the relationship between organizational climate and knowledge donating among alliances sharing tacit knowledge (Becerra et al., 2008). Trust has both cognitive- and affect-based dimensions (Johnson & Grayson, 2005). Both processes play essential roles in the development of trust in interpersonal exchanges (Lu, Kong, Ferrin, & Dirks, 2017; Morrow Jr, Hansen, & Pearson, 2004); in the relationship between network ties (strong and weak ties) and entrepreneurial opportunity discovery and exploitation (Ren et al., 2016). Both types of trust are essential and are independently significant predictors, e.g. of complex knowledge-sharing (Chowdhury, 2005).

Nevertheless, it should be recognized that some research did not find strong relations between trust and the

efficiency of decision-making, e.g., negotiating effectiveness was associated with the quantity of information shared but not with trust (e.g. Mohr & Puck, 2010). Such studies therefore created a contradiction in the understanding of trust in business relations; Endress (2004), for example, believes that trust is often considered one-sided, as merely reflexive, and the cognitive component of this concept is exaggerated.

Affect-based trust is based on emotional ties between partners and often tends to go beyond the business or professional relationship or prior knowledge of performance. It has been shown that affect-based trust is important to managers to support relationships with customers and suppliers (Akrou, Diallo, Akrou, & Chandon, 2016), as well as with subordinates in private companies (Maharani & Riantoputra, 2018). On the other hand, cognitive trust occurs when a person makes a conscious decision to trust based on the best knowledge they possess. This pertained to performance and accomplishments through direct dealings with a partner and based on cognitive reasoning (McAllister, 1995).

In strategic decision-making teams, cognition-based trust is far more important than affect-based trust as a moderator in the relationship between conflict and outcomes (Parayitam & Dooley, 2009; Sohaib & Kang, 2015; Sohaib, Kang, & Nurunnabi, 2019). Cognitive-based trust in a business relationship relies on a conscious evaluation of the partner's ability to carry out their obligations in a deal. Cognitive trust is often based on the repeated interactions of parties (Hite, 2005), the proven reliability of an individual (Lewis & Weigert, 1985), weighing the evidence embedded in the attributes of the transaction and the characteristics of the other parties to the transaction (Morrow et al., 2004), and has connects with task-oriented aspects of work (Yang, Mossholder, & Peng, 2009). At the same time, too much trust is as bad as too little, and in both cases solutions are far from optimal (Jeffries & Reed, 2000).

2.2 Trust in Business Relations as a Probabilistic Choice

Trust is especially valuable in a business partnership because partners have to rely on each other and themselves remain vulnerable to the partners' actions (Gur & Alayoğlu, 2017). Only recently, have researchers begun to pay attention not only to success factors, but also to the difficulties of a business partnership (Berge, 2018; Castaldo, Premazzi, & Zerbini, 2010). For most business deals, it is impossible to monitor every detail, and trust is present in almost every transaction (Davis, Schoorman, Mayer, & Tan, 2000; Minina & Ganskau, 2008). In a competitive environment the business interactions are inevitably accompanied by a willingness to be vulnerable to a partner (Mayer, Davis, & Schoorman, 1995). Under such conditions,

the subject's trust can be seen as a willingness to rely on the actions of the partner and willingness to be vulnerable to contractual and social obligations with the expectation of continued cooperation (Edkins & Smyth, 2006). Among studies focused on the relation between trust and fulfilment of obligation it was found, when trust is high, that apparently employees tend to feel that their psychological contracts are being fulfilled by their organization regardless of psychological contract type (Kraft & Kwantes, 2013). Trust between business partners assumes that they rely on each other and thus put themselves at risk of being vulnerable in a situation of not keeping commitments. In turn, the risk assessment is always connected to the assessment of the probability of the partner fulfilling the obligations under the deal. Thus, in our opinion, trust is associated with an assessment of the likelihood of the partner fulfilling their obligations. This allows us to formulate the following hypothesis.

Hypothesis 1: The probability that a partner fulfils its obligations in a deal is positively related to trust

2.3 Connection Between Control and Cognitive-based Trust in Business Partnership

Cognitive-based trust may be recognized as a way to reduce the level of uncertainty of a partner's cooperative behaviour and increase the predictability of their satisfactory performance. The other reason for decision-making is an opportunity to control the deal – specifically not just the subject's opportunity, but the partner's opportunity as well. Hence, the relations between trust and control needs clarification, especially in the decision-making context. As Das and Teng argued, trust and control operate in a parallel fashion, supplementing each other as the key sources of partner cooperation; control mechanisms have an impact on trust level and the trust level moderates the effect of control mechanisms in determining the control level (Das & Teng, 2001). Both formal and informal control were explored as ways to generate competence trust and intentional trust (Hyder, Chowdhury, & Sundström, 2017), and a combination of formal control and trust, which give rise to high project performance, was studied (Ning, 2017).

Control is a crucial impact factor in partnerships (Beamish, 2013), and cognition-based trust is linked to the unique and interactive relationships between contractual control, the propensity to trust and affect-based trust (Lu & Yan, 2016). But trust might not be seen as a reason not to use objective control. The trust-control relationship is described as either substitutive or complementary (Alpenberg & Scarbrough, 2018; Kalkman & Waard, 2017), and one of the principles – trust or control – would come to dominate as a result of the firm's assessment of the likelihood of opportunistic behaviour by the partner (McEvily,

Perrone, & Zaheer, 2003). The lack of transparency and openness is not a reason not to trust the company or the team. Therefore, there is no clear understanding of how trust and control relate to each other yet. Moreover, control is mostly considered as subject's control over a deal, but not as the willingness of subject to share control with a partner (e.g., Franklin & Marshall, 2019). Because researchers have paid more attention to the dependence between the level of control and level of trust in a partner rather than to sharing of control between partners (e.g., Graça & Barry, 2019), the topic of this study is relatively new.

We agree that the nature of trust and control should be considered as integrated but at the same time parallel concepts. We should pay attention not only to a subject's control over a deal, but also to the subject's preferences for their partner's control. There is a high probability that trust as an attitude to the partner must affect not so much the control from the subject's point of view, but rather their attitude to the extent to which the subject is ready to allow the partner to control the transaction. The question "How much can I trust my business partner, that they will fulfil their obligations?" appears due to perceived uncertainty and the desire to streamline the process of business cooperation. It is highly likely that the level of desired control over the deal is reduced due to the trust in the business partner, but increases in conditions of uncertainty and risk. Thus, hypothetically the subject's trust in their business partner and degree of desired control over the deal should be interrelated. In addition, it is permissible to assume that the subject considers it important to what extent their partner controls their part of the deal. The importance of all dimensions of control increases in a business environment with risk and uncertainty. Based on these arguments, we hypothesize that there are some relations between the dimensions of control and trust.

Hypothesis 2. The difference between a degree of desired control and degree of real control negatively relates to the level of trust.

Hypothesis 3. The partner's control over the deal relates positively to both types of desired control.

2.4 Trust Between Business Partners from Different Countries

The culture of trust is based on mutual moral obligations, social norms and standardized expectations of the behaviour of other people, and cannot be studied in isolation from the environment. Trust, as confidence or social context, is not an entity divorced from the nature and conditions of interaction. If business relations develop between partners from different countries, then trust is due to different points of view on life and the previous experience of each side (Gustaffson, 2008). As Bidault et al. argued, demographic factors are related to the propensity to rely

on trust, and that across nationalities, the sensitivity to partner interaction is a factor affecting trust. The culture of trust is based on mutual moral obligations, social norms and standardized expectations of the behaviour of other people, and cannot be studied in isolation from the environment. The willingness to rely on trust is not entirely determined by the terms of the transaction (Bidault, de la Torre, & Zanakis, 2009).

Studies show that cultural differences among project teams can cause conflict, misunderstanding, and reduced project performance (Ajmal, Helo, & Kassem, 2017). Besides, high distance between business partners can lead them to have unrealistically high expectations of partner performance (Couper, Reuber, & Prashantham, 2019). When collaborating with Russians, westerners prefer to use their own "familiar ways" of doing business. At the same time, researchers on east-west business partnerships indicate that affect-based trust is much stronger and more durable than cognitive- or institutionally-based trust for Russians (Ayios, 2018), and Russian managers willingness to establish personal relationships is important in this context (Weck & Ivanova, 2013). On the other hand, explicit competencies, have significant impacts on the international team members' trust (Wang & Zhang, 2019).

As Ayios mentioned, trust is closely related to the context of social norms and obligations, factors that will be under threat at least in the initial stages of a cross-border alliance (Ayios, 2018). Therefore, because cultural issues are rather sensitive, the trust-building process among international project stakeholders and business partners should be investigated more carefully.

2.5 Cultural Traits of Slovenian and Russian Managers and their Business

The Russian Federation (Российская Федерация, Rossiyskaya Federatsiya), commonly known as Russia (Rossiya), is a transcontinental country extending over much of northern Eurasia (Asia and Europe). The largest country in the world by land area, Russia has the world's ninth-largest population – 146 million people. As a recent study using the Hofstede model showed, there are differences between interdisciplinary professional groups in Russia. A large difference between Russian entrepreneurs and top managers of large companies was revealed in the Avoidance of Uncertainty index: entrepreneurs are more tolerant of uncertainty than top managers. The power distance is higher among workers and officials and relatively low among specialists. A high level of individualism is identified among sales workers. (Latova, 2017). Another study showed that Russians do not live to work, but work to live, do not separate work from leisure, and highly value interesting work. In the last decade, self-esteem has become more important

for Russians than the opinions of others, and they are more focused on business qualities and professionalism than personal qualities (Avios, 2018; Emelyanovich, 2014).

Slovenia is one of the smallest countries of the European Union (20,273 km²; SURS, 2016) with a population of just over two million (2,063,371) (Statistični urad Republike Slovenije [SURS], 2016). It is increasingly open to foreigners, both migrants and tourists, and a consequence of this is growing contact between Slovenians and other cultures. A systematic cross-cultural study (Hofstede, 2001) shows that Slovenians score highly in the power distance dimension. They accept a hierarchical order in which everybody has a place and which needs no further justification. Slovenia could be described as a feminine society, with preferences for cooperation, modesty, caring for the weak and a good quality of life. People living in this country have a high preference for avoiding uncertainty, their daily behaviour is perceived as very well-organized and hard-working, and precision and punctuality are the norms. Security is a crucial element in individual motivation.

According to Hofstede (2011), uncertainty avoidance is a tendency to react in a certain way to situations that are perceived as uncertain, i.e. situations that cannot be adequately structured or categorized due to lack of information. It can be assumed that a partnership between entrepreneurs from different cultures and the activities between them are seen as uncertain due to lack of information. The behavioural component is manifested here in strengthening control over the situation and the people involved in it. In Hofstede et al. (2010), the uncertainty avoidance score tends to be a little higher in Russia than in Slovenia. Thus, it can be presumed that the problem of the correlation of control and trust is also reinforced by the distinct tendency of Russian and Slovenian entrepreneurs to avoid uncertainty. Russians show a higher long-term orientation score (Hofstede, 2001), which may be connected with a more pragmatic approach; they maintain traditions and norms, and truth depends very much on situation, context and time.

Due to the different cultural features of Slovenians (for whom precision and punctuality are the norms) and Russians (they maintain traditions and norms, truth depends very much on situation, context and time.), there will be significant differences between Russian and Slovenian entrepreneurs' attitudes to control over a deal. Therefore, based on these cultural differences, we propose the final hypothesis.

Hypothesis 4: The relation between the level of trust and level of control over a deal will be stronger in the Slovenian sample than in the Russian one.

3 Method

3.1 Participants and Procedure

We invited 143 Slovenians and 161 Russians working for European companies which have an established Slovenian-Russian business partnership with locations in Slovenia by e-mail to fill in an online questionnaire. The questionnaire was presented in two languages – Slovenians filled in the Slovenian version of the questionnaire, and Russians filled in the Russian version. A total of 103 Slovenians and 124 Russians responded. If respondents did not answer every question of the online questionnaire, they were removed from our sample, leaving a total of 103 Slovenians (63 males and 40 females) and 114 Russians (44 males and 70 females).

The online self-reported survey battery was sent to all of the employees of the individual organizations, while their participation was anonymous and voluntary. The survey battery was administered in line with Slovenian law (Personal Data Protection Act 2004-01-3836 and subsequent amendments) and the ethical standards for research approved by the Ethics Committee at the Faculty of Arts, University of Ljubljana (Slovenia). The consent of the participants was obtained by virtue of survey completion. The participants were told also that they could withdraw from the study at any time and that there would not be paid for participating.

3.2 Measures

The survey included questions about demographics (age and gender served as the control variables) and scale items as described below.

Independent variables. There were two independent variables in our study: (1) nationality (Slovenian and Russian) and (2) level of trust in the partner in a business relationship. Respondents' level of trust was assessed using an adapted 12-item scale *The Organizational Trust Inventory* (OTI, short version; Cummings & Bromiley, 1996) including six direct questions and six reverse scored questions. OTI has been used in other cultural contexts, where its validity was also confirmed, especially the short form of the scale (Aydan & Kaya, 2018). It can be used to evaluate trust regarding not only employees, but also suppliers and clients (Vidotto, Vicentini, Argentero, & Bromiley, 2008). Each of three trust dimensions (keep commitments, negotiate honestly, avoids taking excessive advantage) was assessed with four items. For the purpose of our study, some words in the items have been replaced. The scale items are presented in the Appendix section. For instance, we used "I think my Russian (Slovenian) partner tells the truth in negotiations" instead of "We think the people in ____ tell the truth in negotiations". The respondents indicated on

a scale ranging from 1 (strongly disagree) to 7 (strongly agree) how deeply they trust their business partner. Reliability analysis revealed that the internal consistencies (Cronbach's alphas) of all dimensions were acceptable ($\alpha > .618$) to good ($\alpha > .845$), and the OTI is appropriate for further scientific use and development ($\alpha > .840$).

Dependent variables. There were five dependent variables in our study. The first variable is the *probability that the partner will not fulfil their obligations in the deal* (DV1) assessed with the question "Please indicate the probability that the partner will not fulfil their obligations in the deal". Participants indicated their agreement with items on a scale ranging from 0 (Most likely the partner will fulfil their obligations) to 1 (Most likely the partner will not fulfil their obligations). Since we were trying to measure the probability, the answers of the subjects could be in the range from 0 to 1 on a continuous scale; for a question sensitivity we divided the scale into 11 divisions: 0; 0.1; 0.2; 0.3; ...; 0.9; 1. When processing the responses divisional units were converted to percentages, as seen in Table 2.

The other variables were four measures of control developed by the authors. To identify those variables we interviewed five participants and then analysed the structure of control over the deal from our participant's point of view (Table 1):

- *Participant's level of control over a deal* (DV2) was measured by asking participants what percentage of control over the deal's key factors pertain to them and what percentage pertains to the partner. The question was "Please indicate what degree of control over the deal's key factors pertains to you". Participants indicated their answers on a scale ranging from 10% (Only 10% of key factors of a deal are under my control) to 100% (All key factors of a deal are under my control).

- *Participant's desired control over a deal* (DV3) was measured with the question "Please indicate what degree of control over the deal's key factors do you wish to pertain to you." Participants indicated their answers on a scale ranging from 10% (I wish only 10% of key factors of the deal be under my control) to 100% (I wish all key factors of the deal be under my control).
- *The partner's control over a deal* (DV4) was measured by asking participants what percentage of control over the deal's key factors pertains to the partner with the question "Please indicate what degree of control over the deal's key factors pertains to your partner". Participants indicated their answers on a scale ranging from 10% (Only 10% of key factors of a deal are under partner's control) to 100% (All key factors of a deal are under partner's control).
- *Desired partner's control over a deal* (DV5) means how much control over a deal our participant desires to deliver to the partner. It was measured by asking participants what percentage of control over the deal's key factors they wish to pertain to the partner. The question was "Please indicate what degree of control over the deal's key factors do you wish to pertain to your partner". Participants indicated their answers on a scale ranging from 10% (I wish only 10% of key factors of the deal to be under the partner's control) to 100% (I wish all key factors of the deal to be under the partner's control). Cronbach's alpha was .72 for both (partner's and desired partner's) degrees of control.

The questionnaire for control over deals was tested in the study. Due to its specific nature, the definition of its reliability is to be evaluated in the future.

Table 1: *Dependent variables (dv) of the control over deal*

WHO CONTROLS THE DEAL	CONTROL OVER DEAL	
	REAL	DESIRED
PARTICIPANT	DV2 (as participant desired)	DV3 (as participant perceives)
HIS/HER PARTNER	DV4 (as participant desired)	DV5 (as s participant perceives)

4 Results

The average age of the Slovenian respondents was 41.9 (SD = 9.6) and of the Russians was 38.8 (SD = 28.1). A total of 93 Slovenian and 112 Russian respondents had a bachelor's or master's degree, and only 10 Slovenian and two Russian respondents had received a vocational or professional education. Of the total, 56 Slovenian and 32 Russian respondents worked in managerial positions, 25 Slovenians and 61 Russians were entrepreneurs, and 48 Slovenians and 38 Russians were employees. Although there was some variation in the sample with regard to the positions held, the respondents were mostly educated professionals.

No significant correlations were found between demographic variables (gender, age) and trust dimensions (Table 2). Moreover, controlling for these demographic variables in our further analysis did not significantly affect

our study results. The probability that the partner will not fulfil their obligations in the deal was negatively related to the general level of trust ($r = -.414, p \leq .01$), indicating that participants reported more probability of a partner's breach of obligations if their trust in the partner is less. Our first findings indicate that Hypothesis 1 is strongly supported ($r = .349, p \leq .01$).

Desired control over a deal: Cronbach's alpha was .67 for both (subject's and subject's desired) degrees of control. Partner's desired control over a deal: Cronbach's alpha was .72 for both (partner's and partner's desired) degrees of control.

The difference between the degree of desired control and degree of control was negatively related to the level of trust ($r = -.285, p \leq .01$), indicating that participants reported more difference between the degree of desired control and degree of actual control if their trust in the partner was lower. Thus, Hypothesis 2 is also strongly supported.

Table 6: Main Configuration Management Concepts Found

Variables	M	SD	1	2	3	4	5	6	7	8	9	10	11
1. Gender			1										
2. Age	40.9	10.3	-.219**										
3. Probability that partner will not fulfil obligations	33.7	26.7	.038	-.063									
4. Degree of control	63.3	20.3	.092	-.011	.083								
5. Degree of partner's control	56.9	21.7	.148*	-.017	.052	.080							
6. Degree of desired control	63.4	20.9	.043	.094	.070	.506**	.112						
7. Degree of partner's desired control	54.7	23.0	.108	-.001	.101	.239**	.577**	.069					
8. Difference between degree of desired control and degree of control	10.0	14.6	-.068	.061	.075	-.285**	.140	.314**	-.167*				
9. General level of trust	59.2	11.2	.115	.080	-.414**	-.026	.114	-.040	.005	-.225**			
10. Keeping commitments	20.6	4.2	.114	.078	-.396**	-.032	.116	.011	-.050	-.188*	.912**		
11. Negotiating honestly	20.3	4.3	.114	.081	-.349**	.005	.160*	-.020	.052	-.223**	.884**	.816**	
12. Not taking excessive advantage	18.4	4.8	.054	.027	-.343**	-.003	.030	-.079	.054	-.204*	.793**	.576**	.528**

Note: * $p < .05$ ** $p < .01$

To test the hypotheses, we compared the variables of the Slovenian group to those of the Russians (Table 3). Analysis of the differences between the Slovenian and Russian samples showed that Russian partners estimate the likelihood that the partner will not fulfil promises in the deal to be significantly higher ($M = 38.8$,) than in the Slovenian group ($M = 33.7$; $U = 4597$; $p = 0.008$). There were no differences in the groups of Slovenians and Russians concerning how they assessed the level of their control over the deal ($M = 63.3$, $SD = 20.3$) and how they wanted (desired) to control the deal ($M = 63.4$; $SD = 20.9$). How-

ever, the differences were manifested in the level of the partner's control over the deal. Russians recognize more partner control ($M = 61.2$, $SD = 21.6$) than Slovenian participants do ($M = 56.9$, $SD = 21.7$). Differences are also found in the desired control over the deal. For Russians, the desired partner's control ($M = 60.1$, $SD = 23.5$) was significantly higher than what the Slovenians ($M = 54.7$, $SD = 23.0$) prefer as the desired partner's control over the deal.

Table 3: Descriptive statistics of comparison of Slovenians and Russians, according to the Mann-Whitney criterion ($N_{Slovenian} = 103$; $N_{Russian} = 114$)

Measures	Nationality	<i>M</i>	<i>SD</i>	<i>Mann Whitney U</i>	<i>p</i>
Age	Slo	40.9	10.3	5056.2	0.096
	Rus	40.0	10.8		
Probability that partner will not fulfil obligations	Slo	33.7	26.7	4597.5	0.008**
	Rus	38.8	28.1		
Degree of control	Slo	63.3	20.3	5245.9	0.210
	Rus	65.0	22.5		
Degree of partner's control	Slo	56.9	21.7	4312.3	0.001**
	Rus	61.2	21.6		
Degree of desired control	Slo	63.4	20.9	5476.0	0.454
	Rus	62.8	22.7		
Degree of partner's desired control	Slo	54.7	23.0	4032.2	0.000**
	Rus	60.1	23.5		
Difference between degree of desired control and degree of control	Slo	10.0	14.6	2422.0	0.574
	Rus	8.8	14.0		
General level of trust	Slo	59.2	11.2	5225.7	0.161
	Rus	58.2	11.8		
Keeping commitments	Slo	21.2	3.8	4887.5	0.033*
	Rus	20.0	4.5		
Negotiating honestly	Slo	20.3	4.1	5632.5	0.604
	Rus	20.2	4.4		
Not taking excessive advantage	Slo	18.4	4.8	5417.5	0.325
	Rus	18.0	4.6		

Note: * $p < .05$ ** $p < .01$

Figures 1 and 2 illustrate the degree of control for both partners in two contrasting groups with low and high trust in the partner. Two samples (Slovenes and Russians) are presented on Figures 1 and 2, those with below and above average trust, and for each the degree of their own control and that of their partner are shown. Having identified the differences between the groups of Slovenian and Russian participants in terms of how they perceive their and their partners' control, we assumed that trust-control relations can be manifested as follows: the lower the level of trust in the partner, the higher the control should be over the transaction and less should be left to the control of the partner. However, this dependence was found only in the group of Russians (Figure 1). In the group of Slovenians, only the control recognized for the partner was associated with

trust, while their own control remains constant regardless of the level of trust in the partner (Figure 2). As shown in Figure 1, there is a cross-level interaction between the degree of one's own control and degree of one's partner's control with different levels of trust in the Russian sample. We can thus conclude, that in the Russian sample the willingness to give more control to the partner is more strongly tied to the level of trust than their willingness to reduce their own control over the transaction. More specifically, the key point is the difference between the subject's and their partner's control: in a group with a low level of trust, the subject's own control is much higher than the partner control, and in a group with a high level of trust both the subject's and partner's levels of control are almost the same.

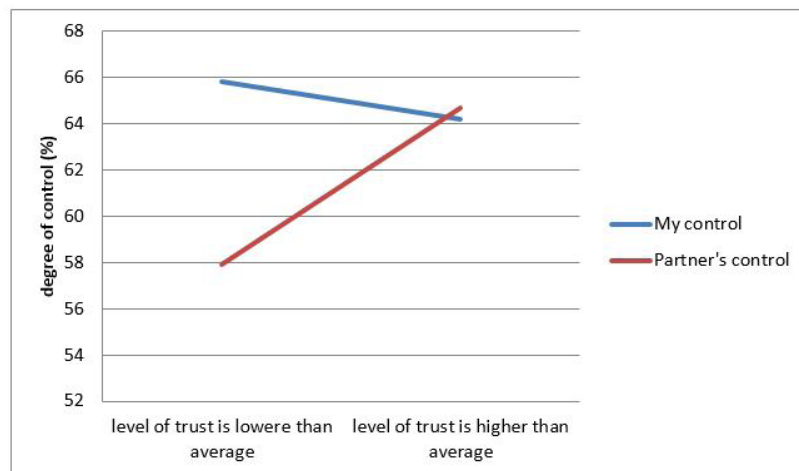


Figure 1: Degree of control and degree of partner's control with different levels of trust in the Russian sample

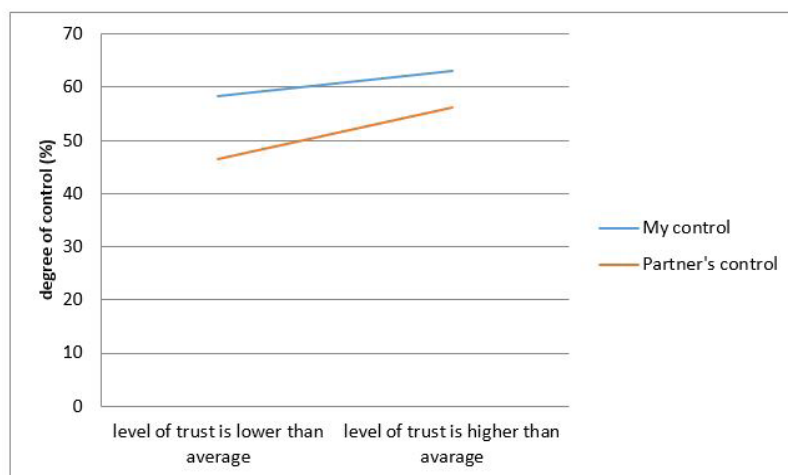


Figure 1: Degree of control and degree of partner's control with different levels of trust in the Slovenian sample

As can be seen in Figure 2, there is no inter-level interaction between the degree of the subject's control and the degree of the partner's control with different levels of trust in the Slovenian sample. In this, the respondents' control over the deal and their agreement with the level of control their partners have is related to the level of trust to a greater extent than in Russian sample. Both the subject's and partner's level of control are equally expressed in groups with high and low levels of trust. The differences are manifested only in relation to groups with different levels of trust – the level of trust increases when the degree of control is lower.

To test *Hypothesis 3*, regression analysis (Table 4) was used to find out which factors have the strongest impact on all variables associated with control ("the level of my control over the deal" and "the desired level of my control over the deal", "the level of control over the deal by the partner" and "the desired level of control by the partner over the deal"). It was useful to compare the degree of influence on these variables of the factors investigated by us and, in the case of an identified link, to find out whether the moderator of trust is such a link.

The variance analysis of these regression models showed the validity of the influence of the set of independent variables (a) nationality and specifics of doing business (in your country, or another), (b) probability that partner will not fulfil their obligations, (c) partner's control and

level of trust on the dependent variable desired partner's control ($F = 22.8$; $p < .01$), while the regression model of dependence of the desired partner's control on the set of the same independent variables was not reliable. We found that none of the factors we are considering affects control over the deal: neither the likelihood of a breach of the transaction, nor the partner's control, nor nationality (Slovenians and Russians) nor the specifics of doing business (in your country, or another). According to these results, trust cannot be considered a moderator. Only the partner's control significantly affects the level of desired respondent's control and desired partner's control (strong influence). Hence, *Hypothesis 3* was supported only in its first part.

It is therefore not the respondent's control but the partner's control that impacts the desired respondents' levels of control over a deal, i.e. control that respondents want to have themselves and control which respondents want to give to their partners. According to the results, the significant influence of the factors (a) nationality (Slovenians and Russians), (b) the peculiarities of doing business (in one's own country or another) on the desired partner control should also be discussed. However, we did not distinguish these two factors in this study, so they should be carefully examined in the future. Thus, *Hypothesis 4* was supported only partly.

Table 4: Regression analysis predicting degrees of control

Variable	Desired level of control			Desired level of partner's control		
	<i>B</i>	<i>SD</i>	β	<i>B</i>	<i>SD</i>	β
Constant	51.394	11.491		13.138	10.406	
Nationality	-2.896	2.966	-.069	5.441	2.685	.118*
Age	.210	.140	.103	.001	.127	.000
Probability that partner will not fulfil obligations	.065	.058	.084	.078	.052	.090
Degree of partner's control	.134	.068	.139*	.573	.062	.540**
General level of trust	-.034	.137	-.019	-.035	.124	-.017
R^2	.039			.353		
F	1.7			22.8**		

Note: $N = 217$. * $p < .05$, ** $p < .01$

5 Discussion

Based on the findings we can conclude that Hypotheses 1 and 2 are strongly supported, and thus the results demonstrate that trust in Russian-Slovenian business relationships is cognitively and not emotionally based. Before making a decision to trust or not trust an international business partner, a business person will take into account the probability that their partner will or will not fulfil their obligations in a deal. If this probability is lower, then the level of trust is higher. The cognitive basis of trust is also demonstrated by the results concerning the difference between the subject's desired level of control and their actual degree of control over a deal with a foreign partner. In our study, this difference is negatively related to the level of trust.

At the same time, Hypotheses 3 and 4 were only partially supported. We suggested that the partner's control of the deal is positively related to both types of desired control, or, in other words, the subject's control of the deal determines how much control the subject wants to have and how much they want to give the partner. If the subject's control is lower, then level of control desired is higher while the level of control desired for the partner is lower. At the same time, this connection is always due to the relationship between people and, in particular, the trust that exists between them. But our results did not show a direct connection between trust and the level of desired control over a deal. We found that trust only affects the subject's willingness to allow their partner to have more control, rather than making the subject more willing to reduce their own control over the deal.

As mentioned above in our theoretical analysis, the trust-control relationship is described either as substitutive or complementary (Kalkman & Waard, 2017; Alpenberg & Scarbrough, 2018). Our results support the view that trust and control are more complementary to each other than substitutive. A previous study underlined that a combination of formal control and trust gives rise to high project performance (Ning, 2017), and our findings suggest this is also reasonable for international business projects.

As Sohaib and Kang (2015) suggested, turning to a comparison between the answers received from the Slovenian and Russian samples, Russian businessmen focus more attention not on building relationships of trust at the stage of establishing contacts (Avios, 2018), but on the future opportunity to influence the course of the partnership. Control over the actions of a partner in future cooperation for Russian entrepreneurs is more important than the step-by-step establishment of trust at the beginning of cooperation. The Russian managers report a higher degree of partner's control and also the desire for more partner's control than Slovenians, which is in line with Hofstede's findings (2001) – based on the masculinity dimension Slovenians are more feminine oriented compared to Russians,

Slovenians' dominant value is caring for others and quality of life, but Russians, in relation to the high power distance score, accept dominant behaviour when it comes from an authority, but is not appreciated among peers. Slovenians' managers express less need for control in their international business. It turns out that the respondents are much more willing to regulate or influence the level of the partner's control over the deal in accordance with their desires (desired partner's control), but their ideal control for them is not so variable (respondent's desired control). As a result, we can underline that the rule "trust, but verify" is in force. Hence, the role of trust in a business partnership, especially in the process leading to the deal, is not so important in itself, but is important only in conjunction with other factors, and thus while the findings agree with those of other studies that note trust is important for business, we found that control is more important.

5.1 Practical Implications

This study contributes to three important domains of research: international business partnership; trust in global business relations; and control over a deal between partners, one of whom conducts business in this country, while the other is from a foreign country and runs their business here.

As our results showed, there is no strong relation between trust in the partner and control over the deal. Therefore, the degree of control over the deal should be seriously acknowledged at all levels of trust in the partner. More specifically, partners should reserve some time to discuss what degree of control they prefer to have and are ready to share with each other. They also should find a balance between their desired and possible degrees of control over a deal. They should not believe that if their partners trust them then this means they are open to reducing their level of control over a deal. This is especially important for international partnerships, where the partners belong to different cultures, or cooperate in situations where one of the partners has just started their business in another country. Our finding that there are no strong differences between most of the variables in the Russian and Slovenian samples is actually good news. This implies that such partners might pay more attention to the control measures of a deal, rather than their partner's nationality. It seems that the most important thing is to negotiate measures and degrees of control over the deal, and especially to consider both partners' expectations concerning what exactly they want from each other's controlling actions.

The results of the present study on the psychological mechanisms of trust and control can benefit the international partnerships developed between entrepreneurs from different countries. In addition, the practical implications of our study's findings might be extended beyond this uncertain situation to one when business partners already

have high levels of trust in each other. This is because we found with regard to the determinants of control over deals that business partners not only strive to build trust, but also to negotiate honestly about having mutually satisfying levels control over their cooperation.

As Russians often say, "Trust the partner, but verify". The significance of this statement for Russian and Slovenian cultures becomes more evident in the context of our study: trust in a partner does not remove control over cooperation, or in other words, "one should not trust a partner absolutely". Thus, finding a balance between trust and control over deals may be recognized as a challenge to both business partners, especially if they have different cultural backgrounds. The current study and the results presented here are helpful in analysing and understanding the control preferences of business partners, and can help in identifying why things worked well or went badly in a business relationship. In a broader context, our results may be applied in training programs aimed at developing such managerial competences as business negotiation skills and strategic thinking.

5.2 Limitations and Future Research

This study has some limitations that should be discussed. A first limitation concerns the fact that we were not able to include information on participants' professional field and the duration of business cooperation between Slovenian and Russian business partners. A second potential limitation relates to the generalizability of our results. The sample of our study mainly consisted of highly educated respondents, which may restrict the generalizability of our findings to less educated people. Future research may investigate whether our results are also found among less educated people. The third limitation of our study is that it relies on single source data, which raises some concerns about common method variance (Podsakoff et al., 2003). Because our study focused on attitudes and behaviour within the person, we were bound to self-report measures. The sample is selective in that participants are engaged in successfully developing Slovenian-Russian business relationships, mostly in Slovenia. However, a more objective investigation would need all participants to interact with each other with different business results. Therefore, we could not use an experimental design with a control group of partners who have unsuccessful experiences of Russian-Slovenian business partnership. As a consequence, our sample is not entirely representative of the general population. Rather, we are interested in examining the mediators by which a business partnership affects when partners are inclined to pursue less or more control over the deal.

Although our participants came from a convenient sample, the sample has its strength in its heterogeneity regarding the experience of Slovenian-Russian business

partnerships and types of business, which allows for greater generalizability of our findings. Because the topic of this study is relatively new, we only focused on establishing a link between trust in the partner and probability of the partner's fulfilment of obligations, and trust in the partner and measures of control over a deal. Now that this association has been established in this study, future research should replicate our findings and measure the process by which levels of trust in the partner affect the degrees of control over a deal. We suggested that trust negatively affects the probability that the partner will not fulfil their obligations in the deal. We also assumed that persons may estimate this probability and establish the degree of control over the deal depending on the trust in the partner. Future research should test these and possible other explanations when studying relationships between trust and control in other cultures.

Finally, future studies could also pay attention to interpersonal relationships between business partners and how these affect the control over the deal. For example, perceptions of business partners' similarity may support the development of coherence and balance in control over the deal. Persons may perceive some of their partners as more trustworthy and capable, and therefore delegate them more control over the deal. These interpersonal factors together with the perception of probability that the partner will not fulfil their obligations could be further explored.

Future research is needed, however, in order to investigate whether control over a deal may be operationalized and used to measure not trust in the partner, but mutual trust between partners. Additionally, future research should pay more attention to intercultural differences, for example, with respect to different countries' experiences of a market economy.

6 Conclusion

Although additional study is needed, some important contributions to research concerning trust-control relations between international (Russian-Slovenian) partners have been made with this work. First, this study has empirically highlighted the importance of distinguishing between the subject's control over a deal and their preferences concerning their partner's control over the deal, independently of the level of trust the subject has in their partner. Both dimensions of control over the deal appear to be about equally important for a business partnership. Second, this article contributes to trust theory in general and in trust-control relations research in particular by testing how trust in a business partner acts as moderator for sharing control over a deal between the subject and their business partner. Cultural factors which can be understood as a resource in a cross-cultural business interaction framework were tested in order to understand what affects the relation between business partners from different cultures. The results

showed only slight differences, which may be an indication that there could be more similarities than differences in the effects of the culture. However, there was an indication that cultural dependence may be more relevant for the effects of the subject's control over the deal than for those of their partner's control. Nevertheless, especially when considering more complex relations such as moderating effects, it is important to continue investigating both dimensions of control over a deal in future research.

The similarities and slight differences identified in present study add insight into the distinctions between the two control dimensions and conceptual model of trust as a predictor for assigning the appropriate levels of control in business relationships. The results indicate that the level of trust in a business partner may not necessarily increase the positive effect of the level of control over the deal. Instead, such forms of dependence could represent ways of coping with an uncertain situation in order to better protect the partnership. Even though the results were not in agreement with all of the hypotheses of the present study, they indicate that the relationship between trust in a business partnership, sharing control between partners, and cultural identity is important to take into account in business trust research. Moreover, the generally positive association between managers' trust and control may be related to how much the partners are interested in the focal deal. The present study thus points to some important areas for future research to explore.

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Povezanost nadzora nad poslom in kognitivnim zaupanjem v mednarodnih poslovnih odnosih

Ozadje in namen: Zaupanje je vpeto v kulturo naroda kot orodje, ki pomaga oblikovati strateška partnerstva in sklepati poslovne odnose. Zaupanje v poslovnega partnerja je lahko posledica očitnih razlik, na primer, kateri del posla želi nadzorovati sam in kateri del posla želi prepustiti partnerju. Če je razlika med resnično in želeno ravniyo partnerjevega nadzora nad poslom velika, je potem sploh mogoče vzpostaviti zaupanje, zlasti v medkulturnih poslovnih odnosih? Tako kulturne razlike kot norme vplivajo na poslovne izide, pri čemer razlike med slovenskimi in ruskimi poslovnimi partnerji s tega vidika še niso bile analizirane.

Namen: Poslovne odnose oblikuje vrsta vedenj, predvsem pa sodelovanje in tekmovanje, ki temeljita na zaupanju. Namen raziskave je bil ugotoviti, ali igra zaupanje moderatorsko spremenljivko v teh odnosih. Želeli smo raziskati, ali poslovni partnerji ob višji stopnji zaupanja, izvajajo manj nadzora. Cilj študije je bil ugotoviti povezavo med stopnjo nadzora in zaupanjem v poslovnih odnosih udeležencev iz različnih kultur.

Zasnova / metodologija / pristop: Sodelovali so 103 slovenski in 124 ruskih poslovnih partnerjev, ki so izpolnili Vprašalnik organizacijskega zaupanja (OTI) ter pet vprašanj o nadzoru nad poslom.

Rezultati: Rezultati so pokazali, da le zaznani nadzor nad poslovnim partnerjem vpliva na raven želenega nadzora kot tudi na želeni nadzor, ki ga udeleženci s strani poslovnih partnerjev pričakujejo.

Zaključek: Pri oblikovanju nadzore v poslovnih odnosih se zaupanje ni izkazalo kot pomemben moderator. Če si poslovni partnerji želijo višje stopnje zaupanja, predlagajo povečanje partnerjevega nadzora, a pri tem niso pripravljeni na zmanjšanje lastnega nadzora. Ta povezava je bila bolj prisotna pri ruskih kot pri slovenskih poslovnih partnerjih.

Ključne besede: zaupanje, poslovni odnosi, poslovni partner, nadzor nad poslom, obveznosti, Slovenija, Rusija.

Appendix: The adapted version of The Organizational Trust Inventory (Cummings & Bromiley, 1996)

Dimensions	Items
Keeping commitments	In my opinion, my <i>Russian (Slovenian)</i> business partner is reliable.
	I feel that my <i>Russian (Slovenian)</i> business partner will keep his(her) word.
	In my opinion, my <i>Russian (Slovenian)</i> business partner does not mislead me.
	I feel that my <i>Russian (Slovenian)</i> business partner tries to get out of his(her) commitments.
Negotiating honestly	I think my <i>Russian (Slovenian)</i> business partner tells the truth in negotiations.
	I feel that my <i>Russian (Slovenian)</i> business partner meets its negotiated obligations to our deal.
	I feel that my <i>Russian (Slovenian)</i> business partner negotiates with me honestly.
	I feel that my <i>Russian (Slovenian)</i> business partner negotiates joint expectations fairly.
Avoiding taking excessive advantage	I think that that my <i>Russian (Slovenian)</i> business partner tries to get the upper hand.
	I think that that my <i>Russian (Slovenian)</i> business partner succeed by stepping on other people.
	I think that my <i>Russian (Slovenian)</i> business partner takes advantage of our problems.
	I think that my <i>Russian (Slovenian)</i> business partner takes advantage of people who are vulnerable.

Development of Corporate Sustainability in Enterprises through the Application of Selected Practices and Tools

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Background and Purpose: The research paper identifies practices and tools to support corporate sustainability concept that can lead to increased business competitiveness in a dynamically developing business world. The purpose of the paper is to provide insight into the practices and tools of corporate sustainability applied by the Slovak industrial enterprises and which barriers do exist. Moreover, the aim is also to identify factors influencing the application of tools such as company ownership, importance of sustainability concept, and company vision.

Design/Methodology/ Approach: In order to obtain the necessary data an online questionnaire was used. The sample of enterprises was selected on the basis of the enterprise size and the industry focus (n = 336). The following statistical methods were used 1) one-way ANOVA, 2) the Kruskal-Wallis test, and 3) the Wilcoxon rank-sum test.

Results: This paper revealed some key insights: 1) foreign-owned enterprises are better at application of sustainability practices and tools, 2) still quite a few enterprises attribute the importance to the concept, 3) the existence of barriers, particularly in the form of a lack of financial resources, 4) one of the key drivers of sustainability is enterprise vision.

Conclusion: The paper created and analyzed quite a comprehensive list of practices and tools suitable for enterprises in Slovakia. There was an effort to find out point at the ways how enterprises contribute to sustainable development. It was also found out that they attach importance to vision as a major trigger for the application of the tools.

Keywords: *Corporate sustainability, Practices, Tools, Barriers, Company vision*

1 Introduction

For any enterprise which tries to be sustainable in every way of its activity, everything begins with operating with integrity. This means that business entity will behave in the sense of respecting fundamental responsibilities in the areas of human rights, labor, environment and anticorruption. The well-being of workers, communities and the whole planet is linked to the health of the business world. For this reason it is necessary for the enterprise to manage proactively own operations and also value chain (United

Nations Global Compact, 2014). The number of factors, e.g. excessive environmental pollution, climate change, corporate behavior towards local communities have led the enterprise to focus on the environmental and social consequences of its activities. This was mainly due to the current situation, marked by environmental burden, high social tension and human behavior. Current models of production and consumption are not sustainable, which is already a well-known fact. Organizations such as the UN, OECD, World Bank, or European Union have paid more attention to this issue. In this regard, enterprises play a significant role. Enterprises can “green” their own products

and also their production. Thereby they can support environmental and social standards in their business chains or implementation of sustainable innovations and solution in the context of sustainable development (Tukker et al., 2008, p.410). The example of sustainable innovation can be the application of the life cycle assessment (Potkány, Gejdoš & Debnár, 2018).

Relatively new and innovative approaches to business have been still a challenge, e.g. corporate sustainability, Industry 4.0 and many others. Sustainability is gaining quite a strong response in the business sphere, as evidenced by several recent surveys (Bonini & Bové, 2014; GlobeScan & BSR, 2019; The Bureau of National Affairs, 2018). This is in conditions of Slovakia not a thoroughly explored area of corporate management. Corporate sustainability can be perceived as an enterprise strategy that monitors long-term business growth, efficiency, performance and competitiveness by integrating economic, environmental and social aspects into corporate management (Kocmanová, Hřebíček & Dočekalová, 2011). Enterprises can use some tools, initiatives or approaches to become a better producer of products with respect to the future generations. Eco-efficiency, life cycle assessment, and sustainability reporting are examples of promoting sustainability which have been developed mainly by and for corporations (Lozano, 2019). Another examples are tools which are described in the study of Hlushko (2018), who divided the tools into qualitative and quantitative ones. He included tools as stakeholder analysis, training handouts, environmental monitoring, social audits, etc. There are many initiatives or tools to support corporate sustainability and they will be discussed in more detail in the next chapter.

The purpose of the paper is to identify initiatives and tools used by Slovak industrial enterprises to support sustainability and evaluate which are the most commonly used. Within the analysis we focused on the existence of potential barriers in their application. Consequently, the aim is also to identify the factors on affecting the use of the tools, e.g. company ownership, importance of sustainability concept, and company vision.

2 Corporate sustainability in business practices

In business practices it is necessary to distinguish, as claimed by Hyršlová (2009), between the “sustainable” enterprise and the enterprise that adopts the concept of sustainable development and seeks to ensure that business activities are in line with the concept. In a business that adopts the concept, changes are required in all business processes, goals, and target values. It means that it is necessary to implement a range of actions and practices within enterprise that can reduce negative impacts and enhance positive effects. In this way the enterprise is on the road

towards sustainability, while sustainability is the ultimate goal that the enterprise seeks. Sustainability is a business strategy that focuses on profitability over a long-term horizon, also requiring environmental and social issues to be incorporated into the business model. Moreover, sustainability practices can bring an improving competition advantage (Clark, Feiner & Viehs, 2015), improving the business performance (Adams, Thornton & Sepehri, 2012), and a long-term success in the long-term perspective (Eccles, Ioannou & Serafeim, 2012). There are other important benefits from acting on sustainability in a proactive way in the meaning of strong correlation with higher equity returns (Khan, Serafeim & Yoon, 2016).

Sustainability at the enterprise level can be considered a way to take measures such as recycling, conservation of non-renewable materials and energy consumption to reduce the negative impacts of business activities on the environment. These types of activities are increasingly becoming part of a deeper strategic perspective in the context of sustainability (Gittel, Magnusson & Merenda, 2012). According to survey of companies from Europe and the United States conducted by The Bureau of National Affairs (2018), these companies see sustainability mainly as reducing company’s environmental impact, investing in long-term growth strategies, and developing more sustainable products and services. These statements reflect the need and involvement in the implementation of sustainability initiatives and practices.

2.1 Practices and tools supporting sustainability

There are many terms which are used in the terminology of this issue, e.g. tools, standards, initiative, activities, methods, practices, principles. The reason is that this issue is quite wide and plenty of supported attributes can be included here. For promoting the corporate sustainability concept an enterprise can use many initiatives and tools which turn the principles of sustainable development into a competitive advantage (Bocken, Short, Rana, Evans & 2014). These business tools present measures for making products and services, and the processes that delivers them, more sustainable. Another type of tools is the management systems and standards designed to promote sustainable business and certification schemes against which they can be benchmarked (International Institute for Sustainable Development, 2013). Global Reporting Initiative (GRI) has a great importance in individual sustainability initiatives and activities. This framework presents a global best practice for reporting publicly on a range of economic, environmental and social impacts and particular activities (GRI, 2015). Some authors divided these practices into environmental area, e.g. reduction of carbon footprint, energy and water conservation, etc. and social area, such

as increasing workforce diversity or improving labor conditions, etc. (Taylor, Ylm & Vithayathil, 2018). For the purpose of this paper we primary divided the sustainability practices and tools in the sense of Triple bottom line principle (framework with three parts: economic, environmental, and social).

According to Global Reporting Initiative (2015, p. 48) the economic dimension of sustainability concerns the company's impacts on the economic conditions of its stakeholders and on economic systems at local, national, and global levels. It does not focus on the financial condition of the company. ISO management standards are one of the used sustainable practices from the economic perspective. The ISO 9000 family of standards provides guidance and tools for enterprises, which want to ensure that their products and services consistently meet requirements of their customer and that quality is consistently improved (iso.org). Also the EFQM Excellence Model is committed to helping companies drive improvement and comprehensive management framework used by over 50,000 companies around the world (efqm.org). Customers, as well as the enterprise itself, can gain tangible and also intangible benefits from the corporate sustainable management activities, which can cause the company-customer relationships to grow stronger (Shin, Thai, Grewal & Kim, 2017). Management control systems have also been linked with regard to environmental and sustainability issues leaving the question open as to how sustainability management control is embedded in the context of the range of management methods applied in an enterprise (Maas, Schaltegger & Crutzen, 2016). Audit is an important practice to support sustainability activities; however, companies still have reserves in using this tool. Furthermore, auditing and reporting of sustainability information are increasingly structured and standardized (Boiral & Gedron, 2011).

The enterprises within the social area of corporate sustainability primarily invest socially responsible actions, which improve their position and motivate their members of staff (Miragaia, Ferreira & Pombo, 2017). These practices and tools concern particular areas such as human capital development, labor management, supply chain labor standards and so on (Lyon et al., 2018). A comprehensive example of tool is the ISO 26000 standard, whose aim is to provide guidance on social responsibility and help all types of organizations contribute to sustainable development (Hahn, 2012). Social area of practices and tools include in particular: training and education, motivation programs, diversity and equal opportunity, human rights which include issues as non-discrimination, gender equality, etc. (GRI, 2015). In the context of motivation, the authors (Lorincová et al., 2016, p.360) pay particular attention to the three most satisfying motivation factors which are significant especially for Slovak companies, and those are physical work demands, "interestingness" of work and usefulness of one's qualification. A possible tool is a social audit representing an independent evaluation of the per-

formance of an enterprise. It relates to the attainment of enterprise social goals and therefore, it is a tool of social accountability of an enterprise (Hlushko, 2018). Another form of social area is characterized by promotion to local community with implemented local community engagement, impact assessments, and development programs (GRI, 2015).

The environmental area of corporate sustainability concept represents mainly the ISO 14000 family of standards, which provide practical tools for enterprises and organizations of all types looking for managing their environmental responsibilities. These standards can help their users in achieving the strategic corporate objective by incorporating environmental issues into business management, providing a competitive and financial advantage through improved efficiencies and reduced costs or encouraging better environmental performance of suppliers by integrating them into the organization's business systems (iso.org). Another important tool is the cleaner production which means "...the continuous application of an integrated preventive environmental strategy applied to processes, products, and services to increase overall efficiency and reduce risks to humans and the environment" (UNEP, 2002). Cleaner production principles are also practiced as waste minimization, pollution prevention, and eco-efficiency (founded as a 4 R): Reduce, Recycle, Reuse, and Reformulate (UNEP, 2002). An example of research in this field is study by authors Vicianová-Hroncová and Hronec (2017) who dealt with the regression analysis between the numbers of environmentally oriented companies and the production of green-house gases, producing sulphur oxide, nitrogen oxide, etc. Further important practices cover also procurement. Green public procurement (GPP; or green purchasing) is a voluntary tool; it has a key role to play in the EU's efforts to become a more resource-efficient economy. It can help stimulate a critical mass of demand for more sustainable goods and services which otherwise would be difficult to get into the market. GPP is therefore a strong stimulus for eco-innovation (ec.europa.eu). Another tool used in this area is eco-labeling. It is a sign of the company's commitment to environmental protection (Witek, 2017). Other examples are reducing environmental impact, raw material sourcing, packaging and waste, opportunities in clean tech, opportunities in renewable energy or green procurement, etc. (Lyon et al., 2018).

However, the view of practices and tools may be slightly different. Table 1 presents the tools recommended for the use created by authors Iatridis and Schroeder (2016) in classification by standards, global initiatives and principles. The last two categories include initiatives and guidelines for sustainability from different organizations, e.g. Global Reporting Initiative, OECD or Global Compact. Each of mentioned organizations has an aim to implement universal sustainability principles through particular tools into business practice.

Table 1: Recommended tools (Iatridis and Schroeder, 2016)

Standards	ISO 9001, ISO 14001, EMAS, ISO 50001, OHSAS 18001, SA 8000, ISO/IEC 27001, ISO 26000
Global Initiatives	GRI, Global Compact, The OECD Guidelines for MNE, UN Guiding Principles on Business and Human Rights, ILO MNE Declaration
Principles	Business Principles for Countering Bribery, Caux Round Table Principles, CERES Roadmap for Sustainability, ETI Base Code, Business Social Compliance Initiative

A representative list of tools used by the most sustainable organizations to manage sustainability in division to certified and assured tools, non-certified tools, international guidelines, disclosure, other management programs, and other tools and systems are presented in work of Nawaz and Koç (2019). In relation to environmental area, tools as environmental management systems and labeling systems, environmental product declaration and eco design are mentioned (Tobler-Rohr, 2011). From our point of view the classification by all authors except Tobler-Rohr provide a complex list of possible sustainability activities. Some are more suitable for large and multinational companies or specific industries.

Many of practices and tools are mentioned in research of Szanto (2018). These are oriented on availability of sustainability themes and practices on selected businesses websites as part of online communication. Reporting is an integral component of the sustainability practices and tools. On the other hand the sustainable reporting tools have some deficiencies: the lack of standardization which makes comparability difficult, corporations deliberately manipulating stakeholders' perception through 'green-washing', the lack of attention to uncertainty in the assessment of sustainability performance and etc. (Siew, 2015).

The use of practices and tools is not compulsory, but it is on a voluntary base. For this reason, enterprises are not forced to use them in a wide range. Many barriers that enterprises can perceive also contribute to this situation. Barriers of changing the corporate behavior to achieve sustainability through applying of some practices and tools are presented by Burnes (2017): the low level of change effectiveness in most organizations; the lack of clarity and consistency of change goals; and the need for appropriate and consistent leadership. Other barriers that can be seen are as follows: pressure on short-term economic performance rather than the long-term vision of the environmental and social sustainability, business's lack of proper competences and/or abilities, lack or improper use of key sustainability indicators, insufficient support by current organizational structure, sustainability as too low priority, insufficient involvement of stakeholders, lack of stimuli to implement sustainable development activities (Bonini, 2012; Hyršlová, 2009). The research question supports the purpose of the paper, as follows:

RQ1: What practices and tools do selected enterprises use to support corporate sustainability and are there any barriers to their application?

An important factor in the implementation of all the concepts based on the Triple bottom line is the factor of ownership of the company capital. In the Slovak conditions, large foreign owned businesses are mostly those which have better opportunities to implement sustainable and responsible entrepreneurship principles (Markuš, 2005). The results of the survey also showed that in terms of ownership, the concept of sustainability is more applied in foreign-owned enterprises (Vicianová, 2011). Integration of corporate sustainability into business activities is still problematic (Witjes, Vermeulen & Cramer, 2016) not only in Slovakia. On the other hand it is evident, that interest of companies in this issue is increasing. The research carried out in 125 companies which are the members of the sustainable business community shows that with more than half of the companies, the sustainability is among the top five priorities for their CEO. Moreover, quarter of companies reported that it is among the top three priorities. This trend points to how sustainability is being prioritized within companies (GlobeScan & BSR, 2019). In regard to the above mentioned facts, we have defined the following hypotheses:

H1: Enterprises with foreign capital use more practices/tools in their practice than is in the case of enterprises with domestic capital.

H2: Enterprises with higher importance dedicated to the corporate sustainability concept use wider range of practices and tools.

2.2 Strategic background of corporate sustainability and its practices

In relation to strategic level of enterprise we encounter the term of sustainable strategic management. It enables the businesses to develop and to apply strategic methods and tools to ensure environmental and social well-being. Sustainable strategic management creates a link between the social, environmental and corporate aspects of the enterprise (Stead & Stead, 2009). The following can help enterprise to be successful in terms of sustainability: reflection of the social and environmental area in corporate mission,

vision and values, application of international social and environmental standards in company management system, defining not only objectives but also measurement of economic, social and environmental areas (Fülöp & Hernádi, 2014). Transformation of sustainable development into enterprise includes changing corporate culture, employee attitudes, defining commitments and responsibilities, creating an appropriate organizational structure, information system, and operational activities (Epstein & Buhovac, 2014).

Enterprises are integrating sustainability across many processes. With regard to results of McKinsey's survey, most respondents claim that their enterprises have integrated sustainability into mission, vision and values (Bonini, 2012) which is considered crucial in this issue. According to Baumgartner and Rauter (2017) there is the need for more concrete guidance that will allow businesses to act strategically and successfully in a sustainable way. It seems that a clear definition of sustainability and a vision is required to support the integration of sustainability into the business (Engert & Baumgartner, 2016). According to a survey conducted among Swedish companies, the company vision must be formulated and promoted among all members of company and that guides the daily work of employees (Chhotray, Sivertsson & Tell, 2018). In practical application of these tools is an important role of institutional pressure for the implementation of these tools (Windolph, Schaltegger, & Herzig, 2014). Based on this, we have defined another research question as well as the last hypothesis:

RQ2: What starting point/driver should be done to implement these practices and tools by enterprises?

H3: Enterprises that attribute a higher importance to a vision and consequently transform it into the business strategy use more practices and tools.

It can be concluded as claimed by the authors Eccles, Ioannou, & Serafeim (2014) that the High Sustainability companies are characterized by several features: a greater attention to nonfinancial measures regarding employees; a greater emphasis on external environmental and social standards for selecting, monitoring, and measuring the performance of their suppliers; and a higher level of transparency in their disclosure of nonfinancial information, etc.

3 Research methodology

3.1 Data collection and sample

To answer the research questions and hypotheses the primary data were obtained through a questionnaire survey using the sample of Slovak industrial enterprises. We have decided to focus on enterprises of all sizes, except

micro-enterprises. In our case the business sized categorization was based on European Commission Directive no. 2003/361/EC (European Commission, 2003) according to employee number. Micro-enterprises were excluded because many of them struggle with survival, often lacking a strategic approach. The object of the investigation was industrial enterprises. The research was based on the division of enterprises according to SK NACE (Statistical Office of Slovak Republic) and industrial enterprises from below mentioned fields having a significant impact on the environment, from our point of view, were taken into consideration. Following industries were selected: leather, wood-processing (incl. manufacturing of furniture), pulp and paper (incl. printing), chemicals, manufacturing of rubber and plastic products, coke and refined petroleum products, pharmaceuticals, metallurgy, engineering (incl. automotive), electrical, and other non-metallic mineral products. The impact of industry on the environment is perceived from two sides: based on the impact of industrial production on the environment as well as the impact of consumption, i.e. the use of industrial products.

We obtained the database of enterprises from the Statistical Office of the Slovak Republic in the number of 2,793. We addressed enterprises (whose e-mail contact was available) with the request to fill out the questionnaire. From the total number of enterprises, 2,125 enterprises were contacted. A total of 501 questionnaires was returned. In order to statistically process individual hypotheses without missing data, 135 questionnaires were excluded. 336 correctly filled out questionnaires were analyzed.

The online questionnaire was focused on application of practices and tools of corporate sustainability (CS) which are shown in Table 2. The list was based on GRI methodology³. Unlike other authors mentioned in subchapter 2.1, we divided the practices and tools into TBL areas, not according to their forms. We focused on commonly used tools in business practice. Respondents had the opportunity to indicate which tools they use in their practice.

Other questions in the questionnaire concerned the existing barriers (whereas we rely on the authors' knowledge from subchapter 2.1) and also the importance that the companies surveyed assign to the concept of sustainability itself. Respondents' attitudes could be expressed on a scale of 1 to 4, with 1 meaning high importance and 4 meaning low importance. Based on the literature background, our interest was to explore the vision of enterprises. We wondered whether enterprises have sustainability elements in their vision. The respondents had the opportunity to respond as follows: yes, partially yes, no, I do not know.

The collected data were processed by MS Excel. Within the descriptive statistics, we used absolute and relative frequencies and averages. The following Figure 1 summarizes the methodology highlighting research questions and hypotheses.

³ <https://www2.globalreporting.org/resource/library/GRIG4-Part1-Reporting-Principles-and-Standard-Disclosures.pdf>

Table 2: Unit Root Test for Panel Data

Selected practices / tools to support CS		
Economic area	Social area	Environmental area
<ul style="list-style-type: none"> • ISO 9001 • Customer satisfaction survey • Audit • Cost reduction programs • Research and development (R&D) • EFQM model • Management of crises • Benchmarking 	<ul style="list-style-type: none"> • Motivation programs for employees* • Additional social programs for employees* • Employees satisfaction survey • Gender equity • Ethic code • System of safe and protection health • Philanthropy • ISO 26000 • SA 8000 • Social audit 	<ul style="list-style-type: none"> • Clean production • ISO 14001 • Renewable resources • Green public procurement • Eco-labeling • EMAS • Carbon footprint • Life-cycle assessment • Environmental reporting • Environmental benchmarking • Ecological footprint

*The difference between motivation program for employees (courses, training, health care) and additional social programs for employees (supplementary pension insurance or life insurance, corporate loans, financial assistance, childcare programs and so on) is that programs offer something extra that is not so common in business practice.

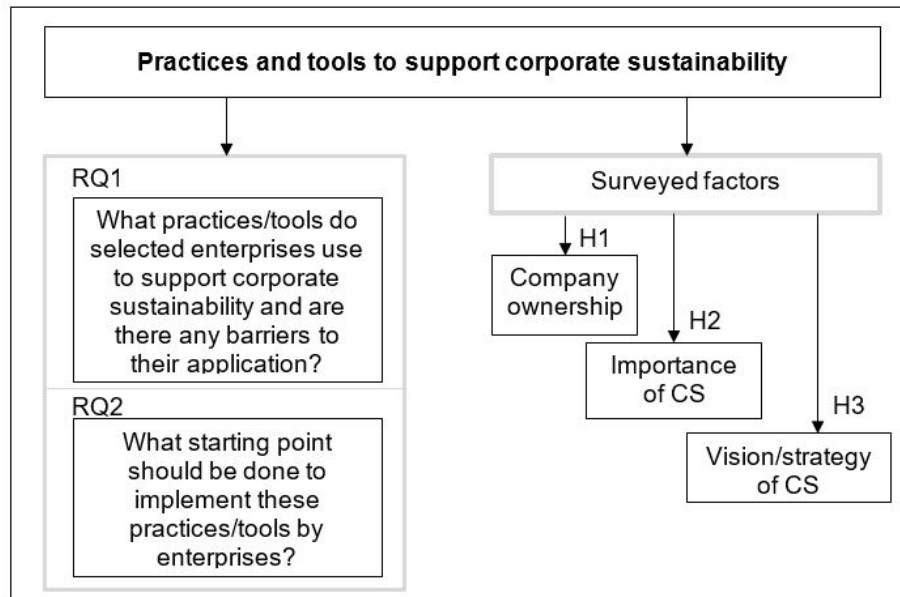


Figure 1: Methodology of research

3.2 Statistics methods

In our study all investigated variables except one are at ordinal level of measurement. These variables play a role in grouping the values in our analyses. The dependent variable of our interest – range of tools - is at the interval level of measurement. When the assumptions of one-way ANOVA – normal distribution of dependent variable and approximately equal variance on the scores across groups are not met we use nonparametric rank-sum tests – the Kruskal-Wallis test and the Wilcoxon rank-sum test for two independent samples.

The Wilcoxon rank-sum test seeks to determine whether two populations are identical in measure of central tendency or different from one another. The test uses a test statistic, symbolized by W that is derived by pooling the data contained in two independent samples, ranking the data from the smallest value to the largest value, and summing the ranks in each sample.

The Kruskal-Wallis test is an extension of the Wilcoxon rank-sum test from two to more than two populations. The purpose of the test remains the same: to determine whether the populations of interest are identical in measure of central tendency or different from one another. A final test statistic H is computed after pooling and ranking the

observations contained in the various samples. A rank sum is computed for each original sample.

All our analyses were carried out using the statistical software STATISTICA 12. We used .05 level of significance.

4 Current state of practices and tool application in Slovak enterprises

The object of our interest was pointing out at the most commonly used practices and tools of sustainability. The research was not focused only on tools in individual areas separately, but also on the joint application. Moreover, we identified the average of practices and tools by particular areas and by industry. The center of attention was to identify the existing barriers and the influence of factors on application of practices and tools such as company ownership, importance of sustainability concept that is linked with company strategy, and company vision.

4.1 Descriptive statistics

Enterprises can use a plenty of tools to promote their attitude to sustainable development. Many of them understand the meaning of responsible behavior towards themselves but also towards the local community, and environment. This behavior could bring many benefits for not only environment but also for enterprises (see Chapter 2). This section provides a brief overview of using corporate sustainability practices and tools in terms of range and average of them in economic, environmental and social area.

Figure 2 presents the most often used practices and tools promoting corporate sustainability. The highest number of enterprises uses management system STN ISO 9001 (nearly 70.00%). It may be caused by a relatively strong pressure to implement these standards in the supply chain. Enterprises which try to differentiate themselves from the competition are aware of the fact that the ability to satisfy customer needs is crucial. The effective and well-implemented quality management system can bring an increasing customer satisfaction, increasing product quality, strengthened trust and relationships between the enterprise and customers, etc. to the company. It can be concluded that enterprises are mainly focused on practices and tools related to customer satisfaction. From our point of view, relatively fewer enterprises in the sample are engaged in research and development (30%), which is considered to be a serious deficiency in Slovak conditions. This may have an impact not only on the creation of enterprise's added value, but also on the environment. The least used practices and tools in the economic area (not shown in Figure 2) are benchmarking (22.62%), management of crises (15.48%) and EFQM excellence model (2.08%).

The application of social practices and tools is relatively balanced. Enterprises focus mainly on employees in the

form of motivational programs (almost 60% of enterprises). On the other hand, the surveyed enterprises apply less following practices/tools: philanthropy (20%) and work-life balance (13.69%). The least represented practices/tools are: STN ISO 26000 Guideline for Corporate Social Responsibility (3.27%), social audit carried out by only 10 respondents (2.98%) and the use of the social responsibility standard and the improvement of working conditions SA 8000 (5 respondents; 1.49%). Enterprises are therefore more focused on the internal community - employees than on supporting the external community. Therefore, we can say that enterprises are not comprehensively focused on this area.

Practices and tools from environmental area represent the clean production (45.24%). Almost 35% of enterprises have an implemented ISO 14001 standard. Slovak enterprises have some limits in application of renewable resources, as well as in green public procurement. The following tools are used less frequently (less than 10%): eco-labelling (5.95%), measurement of carbon footprint (4.76%), environmental accounting (3.87%), life cycle assessment – LCA and environmental benchmarking (3.52%). Ecological footprint is not represented at all.

Figure 3 shows the range of practices and tools used. This range is in the form of averages for each area as well as for all areas together. It can be concluded that the surveyed enterprises use 3 tools on average from the economic area, as well as 3 tools from the social area. Almost 2 tools on average are used in the environmental one. The average of tools from each area together is nearly 9 practices/tools. The highest average of their application is in the social area.

From the perspective of barriers, the enterprises surveyed notice a lack of financial resources for sustainability initiatives (Figure 4). In Slovakia, many enterprises are still struggling with survival, which is reflected in a lack of financial resources, not just for sustainability activities. Making a profit or optimum level of return on capital is a prerequisite for an enterprise to invest in its development or in the development of surrounding communities. Furthermore, enterprises register few stimuli to these initiatives. The stimuli could come from government, customers, etc. We can see that shortsightedness still prevails in the form of short-term profits before long-term development.

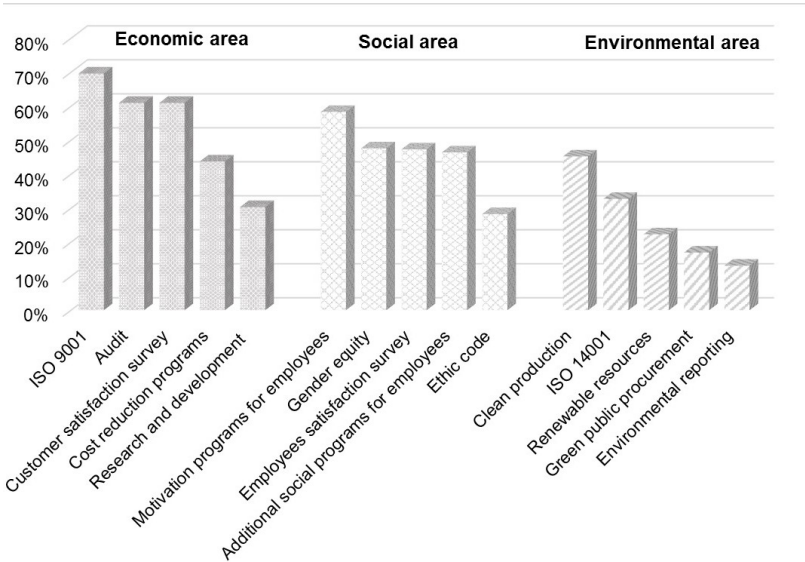


Figure 2: The five most used practices/ tools in individual areas

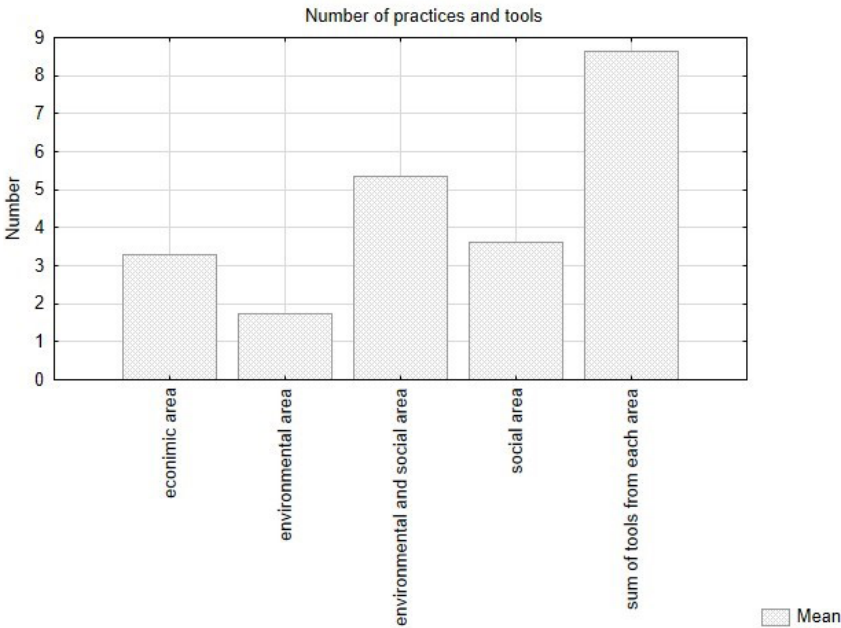


Figure 3: Mean of practices/ tools used by areas

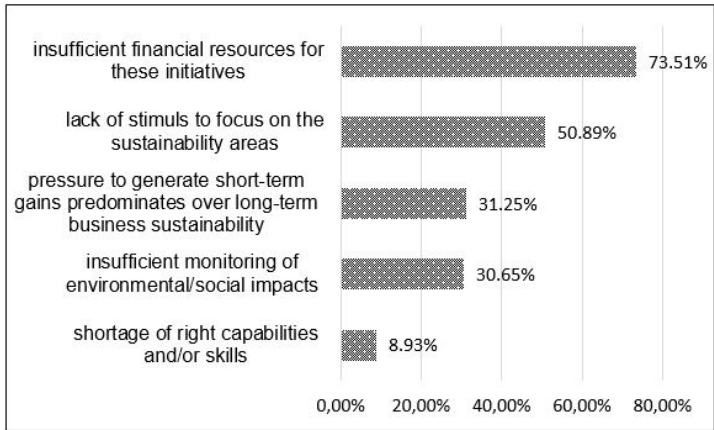


Figure 4: Main barriers of sustainability initiatives

4.2 Results of research hypotheses

Except of evaluation of descriptive statistics we tested hypotheses through selected statistical methods (see Chapter 3.2). We analyzed all surveyed practice and tools mentioned in Table 2. In the first hypothesis, we supposed that enterprises with foreign capital use more practices and tools in their practice than enterprises with domestic capital. The results are presented in the Table 3.

We reject ($p=.000$) the null hypothesis that the average number of used tools is identical among the enterprises with the different capital structure. The enterprises significantly differ in the scope of used tools. The related statistical characteristics are shown in Figure 5.

At the .05 level of significance we reject the null hypothesis ($p=.000$). The capital of enterprise appears to be significantly different in the scope of applied practices and tools. From the results it is evident that enterprises with domestic capital structure are different in application of scope of tools from enterprises with foreign or mixed capital structure. Moreover, enterprises with mixed capital structure are different from enterprises with domestic capital structure. Looking at the tools only from the viewpoint of environmental and social area, we can see the same situation. In the case of mixed-capital enterprises ($n= 27$) the situation is closer to enterprise with foreign capital. Thus,

we can see the impact of foreign investments in the enterprises and consequently these enterprises are more focused on sustainability issues.

The average number of practices and tools in differentiation of enterprises with different capital structure is shown in the next table and figure. The smallest difference in application is in the case of environmental instruments that make up the smallest part.

In the second hypothesis, we supposed that enterprises with higher importance dedicated to the corporate sustainability concept use wider range of practices and tools. Importance given to the concept is measured on the scale (1-high importance, 4-low importance). Again, we have applied Kruskal-Wallis Anova.

At the .05 level of significance ($p=.000$) we reject the null hypothesis about equality of average number of practices and tools. The enterprises with different sustainability concept priority differ significantly in the extent of used tools. The conclusion is in accordance with our hypothesis H2. The basic statistical characteristics are illustrated by using of quartile box plot in Figure 7. The results of multiple comparison are presented in Table 7.

At the .05 level of significance we reject the null hypothesis ($p=.000$). The priority given to the concept appears to be significantly different from the range of used practices and tools, as we expected.

Table 3: Statistics: number of used practices/tools and enterprise ownership

Grouping Variable	Kruskal-Wallis test by Ranks:		
	H (2, N= 336) =45.49 p =.000		
	Valid N	Sum of Ranks	Mean Rank
Domestic capital structure	210	29622.00	141.06
Foreign capital structure	99	21526.50	217.44
Mixed capital structure	27	5467.50	202.50

Table 4: Multiple comparisons

Multiple Comparisons (medians and p-values)	Domestic capital structure	Foreign capital struc- ture	Mixed capital structure
Domestic capital structure ($x = 7$)		0.000	0.006
Foreign capital structure ($x = 10$)	0.000		1.000
Mixed capital structure ($x = 11$)	0.006	1.000	

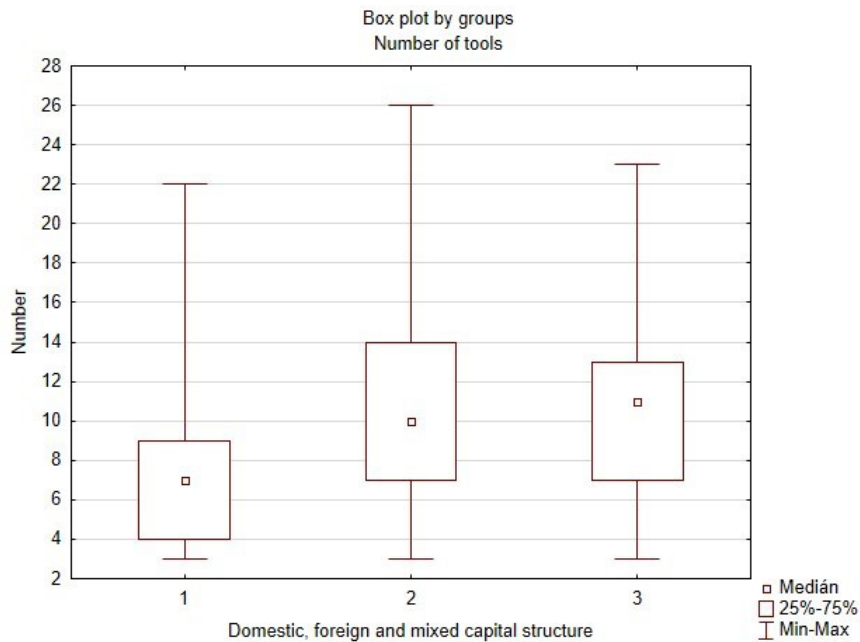


Figure 5: Number of practices/ tools by enterprise ownership

Table 5: Number of practices/ tools by enterprise ownership

Practices/tools	Foreign capital			Domestic capital		
	Sample size	Mean	Median	Sample size	Mean	Median
economic area	99	4.24	4	210	2.77	3
environmental area	99	2.20	2	210	1.48	1
social area	99	4.51	4	210	3.11	3

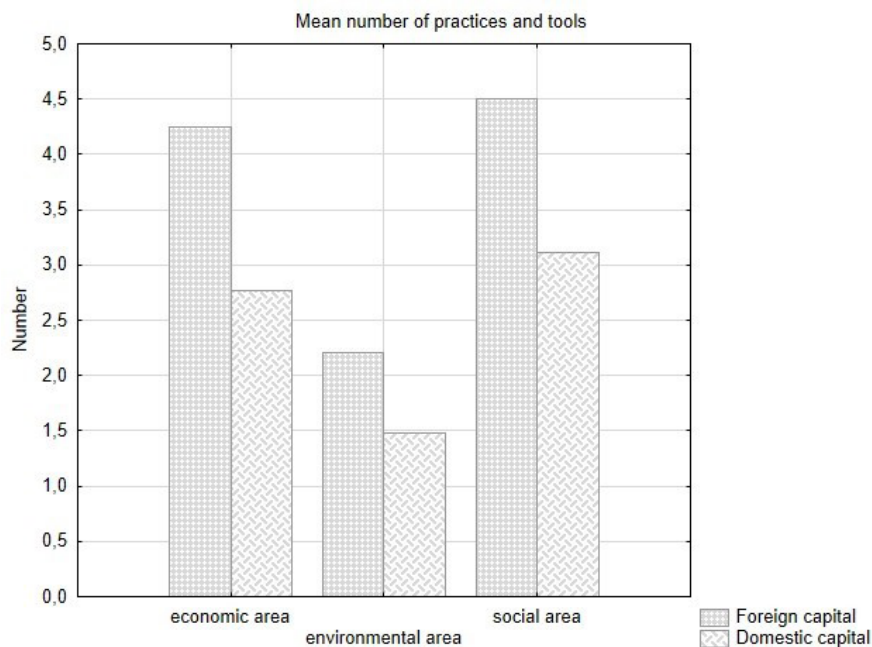


Figure 6: Mean number of practices/tools by different type of ownership

Table 6: Number of used practices/tools and priority to the concept

Grouping Variable	Kruskal-Wallis test by Ranks:		
	H (3, N= 336) =31.46 p =.000		
	Valid N	Sum of Ranks	Mean Rank
High priority	106	20836.00	196.57
Slightly high priority	151	26393.50	174.79
Rather low priority	66	8178.50	123.92
Low priority	13	1208.00	92.92

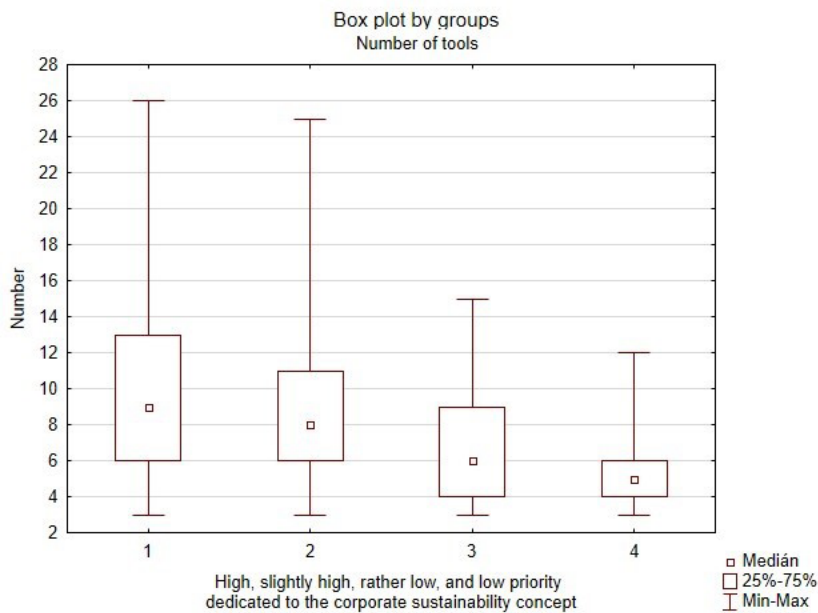


Figure 7: Number of practices/ tools and priority to the concept

Table 7: Multiple comparisons

Multiple Comparisons (medians and p-values)	High priority	Slightly high priority	Rather low priority	Low priority
High priority (9)		0.461	0.000	0.002
Slightly high priority (8)	0.461		0.002	0.021
Rather low priority (6)	0.000	0.002		1.000
Low priority (5)	0.002	0.021	1.000	

From the results in Table 7, it is evident that enterprises with attitude of high (slightly high) priority are different in applying range of tools from enterprises with attitude of low (rather low) priority.

The last hypothesis is linked to the vision of enterprise. The vision is a prerequisite for further development of the enterprise in any direction the enterprise wants. The reason comes from the future oriented feature of vision, whereas

the vision demonstrates the status of enterprise for the next 5-10 years. We assumed that enterprises which have linked corporate sustainability concept to the vision, apply more practices and tools.

From the results (Table 8 and 9) it is evident that there is statistical significant dependence between the range of initiatives and tools and linkage of concept with the vision of an enterprise. The enterprises with no linkage of con-

cept to the vision are different in application. Based on the results we can confirm the hypothesis H3. Enterprises that have set a sustainability aspect in the vision use also more practices and tools.

Table 8: Used practice/tools and vision of enterprise

Grouping Variable	Kruskal-Wallis ANOVA by Ranks:		
	H (3, N= 336) =28.18 p =.000		
	Valid N	Sum of Ranks	Mean Rank
Concept is not linked to the vision	17	1637.00	96.29
Concept is partially linked to the vision	167	27073.50	162.12
Concept is linked to the vision	126	24832.50	197.08
Do not know	26	3073.00	118.19

Table 9: Multiple comparisons

Multiple Comparisons (medians and p-values)	CS is not linked	CS is partially linked	CS is linked	Do not know
Concept is not linked to the vision (x = 5)		0.047	0.000	1.000
Concept is partially linked to the vision (x = 8)	0.047		0.014	0.192
Concept is linked to the vision (x = 10)	0.000	0.014		0.001
Do not know (x = 5)	1.000	0.192	0.001	

5 Discussion

The research paper brings insight into the application of practices and tools to support corporate sustainability concept in the Slovak industrial enterprises. The research questions focused on the application of individual sustainability practices and tools, existing barriers and also what should the starting point of enterprises within these initiatives be. The most applied tool in the Slovak enterprises was management standard ISO 9000. We consider this tool quite common regarding its application in the Slovak conditions. If it is properly implemented, it ensures efficiency gains, increased customer satisfaction that is leading to business development and competitiveness growth. Enterprises applied also motivation programs for employees and clean production. In our opinion, the enterprises need to understand the need for applying these practices and also the importance of sustainability. Their application is beneficial for the enterprise as well as for the whole society. Overcoming existing barriers, in particular in the form of lack of financial resources or lack of stimuli for these activities, could improve the situation of applying practices and tools. The state could also promote the elimination

of deficiency, e.g. in the form of tax remission or subsidies for sustainable initiatives. Enterprises should emphasize more establishing a vision and its subsequent communication to all employees. The fact that every employee will be informed about where the enterprise is heading, is an essential prerequisite for the successful development of the enterprise. We consider the vision a starting point in this process.

Since there are no available statistics of the implementation of sustainability through adequate practices and tools, these research results can summarize reveal reserves related to this issue. From our point of view, we created and analyzed quite a comprehensive list of practices and tools suitable for Slovak enterprises. The benefits can be seen in helping understand how enterprises contribute to the achievement of sustainable development goals. Recognition of vision importance and subsequent strategy seems like a major trigger for the application of these practices.

The limitations of our research appear in the sense of exploring several factors that may affect the application of practices and tools. Many papers deal with the impact of sustainability on business performance, but few papers deal with the issue of specific tools to help behave in terms of sustainable development. A limiting factor is also the

focus of research on industrial enterprises. It is possible to extend the research to service enterprises. Although the focus of this paper may seem narrow, it provides basic overview of tools and barriers and also the opportunities to expand the analysis in further research. Future research will be focused on analyzing the benefits of all these practices and tools aimed at comprehensive fulfillment of sustainable development goals. Another interesting possible point covers the extension of research to the V4 countries.

6 Conclusion

The development of enterprise depends on the development of its employees. The source of employee performance may be sufficient motivation in the form of various benefits, detection and removal of deficiencies through the social audit etc. Environmental investments can also contribute to business development, which can ultimately reduce energy or material intensity, attract customers etc.

The purpose of the present research was to provide insight into the practices and tools of corporate sustainability used by the Slovak industrial enterprises and existing barriers. Moreover, the focus was also to identify the factors influencing the application of tools such as company ownership, importance of sustainability concept, and company vision. The paper relies on research questions in terms of application of particular practices and tools and the position of the vision in this process. We can conclude that enterprises use 8 tools on average, while the least used are in the environmental area. This is surprising, despite the fact that nowadays the pressure on environmental behavior is increasing. Recognizing that sustainability is a complex and comprehensive issue, we have focused only on a specific area of application of practices and tools, and we highlight the following key insights:

- Foreign-owned enterprises are better at using practices and tools than domestic-owned enterprises. This can be caused mainly by the impact of foreign investment, which is more focused on sustainability issues. Enterprises are gradually implementing these practices into our business conditions.
- 31% of enterprises assign a great importance to the sustainability concept. These enterprises apply more practices and tools, which is logical. In this case, it was crucial to find out the amount of such enterprises and whether the perception of the concept has a real impact on application the tools.
- In the case of existing barriers we can confirm as Bonini (2012) that they exist in a form of increased pressure of short-term earnings; performance is at odds with longer-term nature of sustainability, and there is also a lack of incentives tied to performance on sustainability initiatives. In the case of Slovak enterprises, there is also a problem with financial resources to support this kind of business behavior.
- One of the key drivers for sustainability is the vision. This is an important starting point for a business to “move” towards sustainability. In this respect, the strategic management of the enterprise determining the direction of the company, is very useful. It also monitors the external environment. We can state that sustainability in all its aspects is a current trend. More and more attention is being paid to directing activities towards sustainable development goals. In this connection, the egoist principle is not adequate, but the principle of consideration of future generation’s needs is. The world is constantly changing. The future will show whether the sustainability and its activities are justified.

We share the opinion of the author Baumgartner (2014) that we are facing the urgent need to implement strategic measures to make enterprises behave in a more sustainable manner. Because of that it is necessary to implement and to apply more practices and tools in this area. Sustainability plays a key role in long-term period – and its initiatives needed to be incorporated into the strategic issue in a holistic way.

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Razvoj korporativne trajnosti v podjetjih z uporabo izbranih praks in orodij

Ozadje in namen: V članku so opredeljene prakse in orodja za podporo konceptu trajnostnosti podjetij, ki lahko privedejo do večje konkurenčnosti poslovanja v dinamično razvijajočem se poslovnem svetu. Namen prispevka je zagotoviti vpogled v prakse in orodja korporativne trajnosti podjetij, kakršna uporabljajo slovaška industrijska podjetja, in identificirati ovire za njihovo uporabo. Cilj je tudi ugotoviti dejavnike, ki vplivajo na uporabo orodij, kot so lastništvo podjetja, percepcija pomena koncepta trajnosti in vizija podjetja.

Zasnova / Metodologija / Pristop: Za pridobitev potrebnih podatkov je bil uporabljen spletni vprašalnik. Vzorec podjetij je bil izbran na podlagi velikosti podjetja in panoge ($n = 336$). Uporabljene so bile naslednje statistične metode: 1) enosmerna ANOVA, 2) Kruskal-Wallisov test in 3) Wilcoxonov testni seštevek.

Rezultati: Raziskava je razkrila nekaj ključnih spoznanj: 1) podjetja v tuji lasti več uporabljajo trajnostne prakse in orodja; 2) še vedno precej podjetij ne pripisuje pomena trajnosti; 3) ovire obstajajo zlasti v obliki pomanjkanja finančnih sredstev; 4) eden ključnih dejavnikov trajnosti je vizija podjetja.

Zaključek: V članku smo analizirali dokaj obsežen seznam praks in orodij, primernih za podjetja na Slovaškem. Prizadevali smo si, da bi ugotovili, kako podjetja prispevajo k trajnostnemu razvoju. Ugotovljeno je bilo tudi, da pripisujejo pomembnost viziji podjetja kot glavni pobudi uporabe orodij.

Ključne besede: korporativna trajnost, prakse, orodja, ovire, vizija podjetja

Fraud Prevention in the Leasing Industry Using the Kohonen Self-Organising Maps¹

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Background and Purpose: Data mining techniques are intensely used in various industries for the purpose of fraud prevention and detection. Research that focuses on the leasing industry is scarce, although frauds in the field of leasing occur rather often. First, we identify clusters of business clients in one leasing company by using the method of self-organising maps based on leasing contract attributes. Second, we compare clusters based on the presence of fraudulent clients, in order to develop fraudsters' profiles.

Methodology: For detecting characteristics of fraudulent clients, we use a client database containing leasing contract attributes of one Croatian leasing company. In order to develop profiles of fraudulent clients, we utilise a clustering procedure with the Kohonen Self-Organizing Maps supported by Viscovery SOMine software.

Results: Five clusters were identified and labelled according to the modal values of attributes describing the leasing object and the industry in which the client operates: (i) New cars / Trade; (ii) Used trucks or tugboats / Other services; (iii) New machinery / Construction; (iv) New motors / Trade; and (v) New machinery and tractors / Agriculture.

Conclusion: Self-organising maps have proved to be a useful methodology for developing profiles of fraudulent clients in leasing companies. Companies can use our results and make additional efforts in monitoring clients from the identified industries, buying specific leasing objects. In addition, companies can apply our methodology to their own databases, in order to develop fraudster profiles for their specific purposes, and implement fraud alert mechanisms in their client database.

Keywords: *fraud, leasing, self-organising maps, Viscovery SOMine, Ward algorithm, Croatia, data mining*

1 Introduction

Knowledge management consists of the processes of creating, storing/retrieving, transferring and applying knowledge (Alavi & Leidner, 2001). The process of knowledge discovery is an important subprocess in knowledge management (Wang & Wang, 2008). Some of the tasks solved by data mining are clustering and deviation detection (Folorunso & Ogunde, 2005), which also includes fraud detection. Numerous other applications are also focused to

rare events, such as bankruptcy (e.g. Moradi, Salehi, Ghorani & Yazdi, 2013). In this paper, the focus is on fraud in the leasing industry.

Frauds represent an issue for leasing companies and regulators, which should be able to predict fraudulent behaviour and take different actions to prevent losses caused by fraud. Defence against frauds includes the implementation of operational and technical solutions for fraud prevention and detection. Fraud detection systems are based on data mining techniques and methods that can discover and visualise patterns related to fraudulent behaviour, such

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as financial frauds (Sadgali, Sael, & Benabbou, 2019), credit card frauds (Carcillo et al., 2019), and frauds in the insurance sector (Leite, Gschwandtner, Miksch, Gstrein, & Kuntner, 2018). Cluster analyses and profiling of clients based on various behavioural, demographic and operational attributes contained in clients databases are essential tools in analysing transactions, and recognising client profiles, which have been used in various industries, such as banking (e.g. Pejić Bach, Juković, Dumičić, & Šarlija, 2014). Clients profiling based on the cluster analysis has also been used in various researches and has been proved as a useful tool in predicting fraudulent behaviour, which can help companies to develop appropriate fraud detection and response systems, e.g. financial statement fraud detection system (Chen, Liou, Chen & Wu, 2019). Current research on fraud detection and prevention in the leasing industry is scarce (Singleton & Singleton, 2007), with only a few examples that present the utilization of data mining techniques for that purpose. For example, Horvat, Pejić Bach and Merkač Skok (2014) used a decision tree modelling in order to discover fraud in leasing agreements.

Self organizing maps have been efficiently used to explain fraudulent behaviour in different contexts of the financial industry, including banking (e.g. Merkevicius, Garšva, & Simutis, 2004; Balasupramanian, Ephrem, & Al-Barwani, 2017) and insurance (e.g. Hainaut, 2019). However, to our best knowledge, previous works did not utilise self-organising maps for fraud profiling in leasing, although self-organising maps have been previously effectively deployed for fraud prevention and detection (Jian, Ruicheng, & Rongrong, 2016). The research question that emerges is whether self-organising maps are an appropriate method for identifying and describing clusters of clients in the context of the leasing industry, with the specific goal of detecting specific attributes that could explain the fraud in the leasing industry. In order to shed some light on this issue, we develop the methodology for developing fraudsters profiles using self-organising maps, based on the leasing contract attributes. We use the database of one leasing company with the rich data on client characteristics and behaviour, for the identification of fraudulent behaviour. First, we use self-organising maps in order to develop clusters of business clients in a leasing company based on leasing contract attributes. Second, we identify the characteristics of fraudulent clients among cluster members.

The paper is structured as follows. After the introduction, the literature review section describes frauds in the leasing industry and gives an overview of previous research related to fraud modelling. The second section explains the methodology of the research, including the self-organising maps, the sample description, and the statistical analysis. The fourth section provides results of the clustering procedure and the fraud analysis according to client and leasing characteristics. It also contains the interpretation of the clusters and profiles of fraudsters for each of the clusters based on all the attributes used for the

analysis. The last section is the discussion and conclusion section, which provides a response to the research question and describes the contributions of this research.

2 Literature review

2.1 Fraud in the leasing industry

Fraud causes material and immaterial losses to an organisation or a person. According to the Basel Committee (Basel Committee on Banking Supervision, 2002), frauds are loss events that are classified into internal and external frauds. Internal frauds are “losses due to acts of a type intended to defraud, misappropriate property or circumvent regulations, the law or company policy, excluding diversity and discrimination events, which involves at least one internal party” (Basel Committee on Banking Supervision, 2002, p.3), such as accounting administrators. External frauds are “losses due to acts of a type intended to defraud, misappropriate property or circumvent the law, by a third party” (Basel Committee on Banking Supervision, 2002, p.3), such as clients or partners. Fraud is often both internal and external.

European Commission (2011, p.3) defines a lease as “an agreement whereby the lessor conveys to the lessee in return for a payment or series of payments the right to use an asset for an agreed period”. In order to understand the concept of fraud in leasing, it is necessary to understand ownership rights in the context of the leasing contracts. During different stages of the leasing contract, difficulties in executing ownership rights can occur. Such differences can be the result of the complex leasing law framework (Flath, 1980). However, fraud in leasing, as in other financial industries, is often intentionally conducted by the client. In that case, leasing companies are usually not able to reach a client or locate a leasing object. For example, fraud happens when a client refuses to return a leasing object after a lease expires. In such a scenario, a leasing company can contact a client and it knows the location of a leasing object but regaining or repurchasing a leasing object is not possible without a complex law procedure.

This research focuses on frauds and defaults committed by clients (small and medium companies, and sole proprietorships) in the leasing industry. Defending leasing companies against leasing fraud brings challenging issues both operationally and technically. An efficient fraud defence system in the field of leasing has several prerequisites. A leasing organisation needs to create anti-fraud measures and introduce them to its employees, as well as to keep employees aware of the fact that frauds are a part of the leasing industry (Boobyer, 2003). Cross-departmental cooperation and communication, especially of sales, human resources, and accounting department, as well as cooperation with external experts are also needed. Addi-

tionally, an organisation should establish client verification procedures (Wang, Cheng, & Chen, 2019). In leasing, such procedures are used to verify leasing objects such as verification of client economic activity, verification of payments and so on. Upgrading information systems with data analytics and warning systems that would support decisions in relation to potentially fraudulent clients are crucial as well (Bănărescu, 2015).

2.2 Fraud modelling

Fraud and default modelling are based on various data mining methods. Ngai, Hu, Wong, Chen and Sun (2011) reviewed data mining techniques for the detection of financial fraud. They concluded that logistics models, neural networks, decision trees, and the Bayesian belief network are the primary data mining techniques for financial fraud detection. Sadgali, Sael and Benabbou (2019) reviewed the performance of various machine-learning techniques such as classification, clustering, and regression for fraud and prevention detection. In addition, visual analysis techniques are used for the identification of fraud detection. In identifying and preventing attempts of fraud, detection of suspicious events can be made by using visual analytics techniques (Leite, Gschwandtner, Miksch, Gstrein, & Kunter, 2018), who categorised, described and discussed current visualisation, interaction and analytical methods that can be used in fraud detection systems. Chen, Liou, Chen and Wu (2019) proposed the approach for detecting fraud in the financial statements in business groups by using data mining techniques.

However, current research does not conclude which method performs the best in fraud prevention and detection, although several authors identified that neural networks and clustering were the most efficient. Deep convolution neural networks (DCNN) were used to detect fraudsters in customer records of a mobile communication company (Chouiekh & Haj, 2018). The authors stated that DCNN outperforms support vector machines, random forest and a gradient boosting classifier in terms of accuracy and training duration.

Data mining methods have been implemented in various application areas related to fraud. Rousseeuw, Perrotta, Riani and Hubert (2019) combined the idea of the Fast LTS algorithm (least trimmed squares) for robust regression for the detection of unexpected events in time series. These unexpected events are often outliers and shifts that can represent suspicious transactions. An intuitionistic fuzzy set, one of the classification methods, and evidential reasoning were proposed for fraud detection in banking transactions by Eshghi and Kargari (2019), who modelled transactional behaviour by considering the trends of different variables. The method determines the originality of a newly arrived transaction.

Credit card fraud has been researched by several au-

thors. Lucas et al. (2020) used a hidden Markov model and a random forest classifier for credit card fraud detection. The hidden Markov model was used to associate a likelihood to a transaction given its sequence of previous transactions. Likelihoods are then used by a random forest classifier for fraud detection. Ryman-Tubb, Krause and Garn (2018) presented a survey of methods that use AI and machine learning for credit card fraud detection, with the conclusion that in terms of accuracy neural networks were on average better than other techniques. West and Bhattacharya (2016) analysed issues of credit card fraud mining related to the choice of detection techniques, problem representation, feature and performance analysis. Nami and Shajari (2018) proposed a two-stage method of detecting fraudulent payment card transactions. The method is based on k-nearest neighbours, the dynamic random forest algorithm and the minimum risk model. Patil, Nemade and Soni (2018) used the big data analysis framework and machine learning algorithms for real credit card fraud detection. Deployment of a fraud detection system based on machine learning methods in a large e-tail merchant was explored and described by Carneiro, Figueira and Costa (2017). Ensemble learning is a common method used in various practical problems. Zareapoor and Shamsolmoali (2015) evaluated and compared various data mining techniques for credit card fraud detection. They presented the decision tree based bagging classifier as the best classifier to construct the fraud detection model. Deep learning neural networks, Generative Adversarial Networks, were used to improve the effectiveness of classifiers for credit card fraud detection by Fiore et al. (2019). Tu, He, Shang, Zgou and Li (2019) proposed convolutional neural networks for the enhancement of anti-fraud systems in the area of e-commerce payments.

Several pieces of research have been conducted in the area of insurance. Yan, Li, Liu, and Qi (2020) used an adaptive genetic algorithm with a backpropagation neural network for simulation and prediction of frauds in the automobile insurance claim data. An Artificial Bee Colony algorithm-based Kernel Ridge Regression was proposed for automobile insurance fraud detection by Yan et al. (2019). An Artificial Bee Colony was used for global optimization and to optimize the parameter combination of the Kernel Ridge Regression. Wang and Xu (2018) proposed a deep learning model for automobile insurance fraud detection based on text mining. They used the Latent Dirichlet Allocation-based text analytics to extract text features of the descriptions of the accidents in the claims. Deep neural networks are used for detecting fraudulent claims. Neural networks were used to detect fraud in the automobile insurance industry, with the aim of fraud detection when it comes to personal injury claims (Viaene, Dedene, & Derig, 2005). Machado and Santos (2015) used five strategies for auditing vehicle claims and concluded that neural networks perform the best. Šubelj, Furlan, and Baje (2011) proposed an expert system for the detection of groups of

automobile insurance fraudsters by using an Iterative Assessment Algorithm (IAA). Patel and Singh (2013) used genetic algorithms to detect fraudulent activities in credit card transactions. Fuzzy C-Means clustering and supervised classifiers comprise the novel hybrid approach that was proposed for detecting fraud in an automobile insurance dataset (Subudhi & Panigrahi, 2017). Nian, Zhang, Tayal, Coleman and Li (2016) proposed a spectral ranking method for automobile insurance fraud detection, while Caldeira, Gassenferth, Machado and Santos (2015) used neural networks for the same purpose.

Additionally, neural networks were used to detect fraud in the context of bank direct marketing (Zakaryazad & Duman, 2016) and card payments and operations (Dorronsoro, Ginel, Sánchez, & Cruz, 1997). Recurrent neural networks were used for the detection of stock price manipulation activities by Wang, Xu, Huang, and Yang (2019). The authors concluded that the method could be used to identify unusual trading activities among huge amounts of data.

2.3 Kohonen self-organising maps in fraud research

Self-organising maps (SOMs), Kohonen Map or Kohonen Neural Networks are feed-forward neural networks based on unsupervised learning and a clustering algorithm that produces two dimensional and nonlinear mappings of multidimensional data (Urueña López et al., 2019).

SOMs are widely used for research in different contexts of the financial industry, including banking, insurance and so on (Van Hulle, 2012).

Pejić Bach, Juković, Dumičić and Šarlija (2014) identified three clusters by using self-organising maps for business clients' segmentation in the context of the Croatian banking industry, and authors suggested marketing activities for the identified clusters. Holmbom, Eklund and Back (2011) described how self-organising maps could be used for customer portfolio analysis. Merkevicius, Garšva, and Simutis (2004) explored the usage of self-organising maps for forecasting of credit classes.

Only several researchers investigated the usage of SOMs in fraud. Urueña López et al. (2019) used self-organising maps for finding hidden relationships in data about fraud on the Internet, computer users' behaviour, as well as security incidents. Balasupramanian, Ephrem and Al-Barwani (2017) proposed an architectural framework that uses big data analytics and the self-organising maps to handle card fraud effectively. Olszewski (2014) presented how self-organising maps can be used for visualisation of user profiles and comparison of frauds in credit card transactions, telecommunications, and networks. Almendra and Enachescu (2013) present an algorithm that combines the self-organising map with the supervised learning paradigm with labelled data in the context of online auction

sites. Quah and Sriganesh (2008) described a real-time fraud detection approach aimed at a better understanding of fraudulent spending patterns based on self-organising maps. Zaslavsky and Strizhak (2006) derived the model of a typical cardholder's behaviour and analysed suspicious transactions by using self-organising maps. Brockett, Xia, and Derrig (1998) classified suspicious automobile bodily injury claims by using self-organising maps.

Data mining has been extensively used in fraud detection and prevention, with various areas of applications, such as credit card fraud and insurance fraud. Several researchers indicated that neural networks outperform other methods for fraud prevention and detection. To our best knowledge, no research presents the application of data mining in fraud prevention and detection in the leasing industry.

3 Methods

3.1 Self-organising maps (SOMs)

The goal of using the SOMs is to discover similarities among elements in the set of instances and to organise the neurons in the computational layer into clusters associated with patterns in the set of instances. Therefore, SOMs are visual representations of learned structures that appear as clusters of similar objects.

The basic SOMs algorithm can be described as follows (Bação, Lobo, & Painho, 2005). The neighbourhood function is a function that decreases with the distance to the winning node and is responsible for the interactions among nodes. During training, the radius of this function decreases, so each node becomes more isolated from the effects of its neighbours. The winning node changes its weight vector to become more similar to the input vector. All neighbours of the winning node also change their weights to the direction of the input vector. Thus, the weight vectors of neighbouring nodes become similar because of their convergence with the winning node towards the input data vector.

The corresponding error function $E(w)$ with an expectation value converging to a minimum during the training process (distortion measure) is:

$$E = \int \sum_i h_{ci} |w - x| g(x) d_n x, \quad (1)$$

where h_{ci} is the neighbouring function of node i to the corresponding winner $c(x)$, and $g(x)$ the density function of the vectors x in the n -dimensional data space. The Kohonen net is obtained in a discrete data space by computing the optimal weight vectors for minimizing $E(w)$ using a gradient descent (Viscovery, 2019).

In addition, SOMs can be seen as a form of k -means clustering in which every unit corresponds to a "cluster", and the number of clusters is defined by the size of the

grid (Wehrens & Buydens, 2007). In comparison to the k-means clustering, Kohonens's self-organizing maps showed more accuracy in classifying most of the objects when the number of clusters is lower than eight (Abbas, 2008). Bação, Lobo, and Painho (2005) also proposed the use of SOMs as a possible substitution for the k-means clustering. They concluded that during the search, space is better explored by SOM, and by the end of the search process, the SOM is the same as k-means, which allows for a minimization of the distances between the nodes and the winning node. The main reason for the usage of SOMs in this research is that the k-means clustering algorithm is mainly used for minimizing the sum of squared distances between the input and the prototype vectors, but it does not perform topological mapping like Kohonen self-organizing maps do (Van Laerhoven, 2001).

SOMs are used in state-of-the-art software. Viscosity SOMine software is specialised software, which enables clustering by using two algorithms that are based on the classical hierarchical agglomerative cluster method of Ward (Viscosity, 2019). The first algorithm is based on the Ward method, which uses the variance criterion as a distance measure. The second algorithm is the SOM Ward algorithm based on the modified Ward method. It is developed on the ground of the soft computing paradigm. In this method, the topological neighbourhood influences the cluster merge steps (Viscosity, 2019). The nodes with many corresponding data records have a higher impact in comparison with the nodes with fewer matching records (Viscosity, 2019).

As a distance measure, a modified Ward distance is used. This distance observes the topological locations of the clusters. It means that two clusters that are not neighbouring in the SOM are never considered to be merged (Viscosity, 2019):

$$d_{rs} = \begin{cases} 0 & \text{if } n_r = n_s = 0, \\ \frac{n_r n_s}{n_r + n_s} \|\bar{x}_r - \bar{x}_s\|^2 & \text{otherwise.} \end{cases}$$

$$\rightarrow d'_{rs} = \begin{cases} d_{rs} & \text{if clusters } r \text{ and } s \text{ are adjacent in the SOM.} \\ \infty & \text{otherwise.} \end{cases}$$
(2)

Then, the SOM – Ward distance is normalized with an exponential function (Viscosity, 2009):

$$\mu(c) = d(c) * e^{\beta}, \quad (3)$$

where $d(c)$ indicates the SOM-Ward distance used to merge c clusters into $c-1$ clusters and β is a linear regression coefficient ($3 \leq c < C$).

For this research, the SOM-Ward algorithm supported by Viscosity SOMine software was used.

3.2 Sample description and statistical analysis

In this research, the analysis was performed using the client base of one Croatian leasing company containing data on 13,057 small and medium enterprises (SMEs) and sole proprietorships as clients with expired leasing contracts. The dataset contains numerous attributes. The following attributes were used.

- Client sector - a nominal attribute related to demographic characteristics of clients, and it has eight modalities: *agriculture, chemical, construction, financial, trade, other services, public, and tourism*
- Client New/Old - a nominal attribute related to behavioural characteristics of the client, and it is represented by two modalities: *new* and *old*
- Leasing object - a nominal attribute related to operational characteristics of the lease agreements. 12 modalities describe it: *car, light commercial vehicle, truck_tugboat, machine, equipment, trailer_semitrailer, motor, agri_forest, forklift, vessel, public* and *other*
- Leasing object New/Used - a nominal attribute describing operational characteristics of the lease agreements. It is represented by two modalities: *new* and *used*
- Leasing type – an operational attribute with two modalities: *financial* and *operative*
- Client type – a demographic attribute with two modalities: *company* and *sole proprietorship*
- Client County – a demographic attribute with 20 modalities: all the Croatian counties
- Client rating – a behavioural attribute with four modalities: R2, R3, R4, and R5 (*R2-the lowest risk, R5-the highest risk*)
- Risk mark – a behavioural attribute with two modalities: *No_estimation, No_risk, and Risk*

For the purpose of this research, fraud is defined as every act of a client that decreases the possibility to regain a leasing object or payment during collection (Pejić Bach, Vlahović, & Pivar, 2018). The goal of the research is to develop an algorithm that could be used for the purpose of fraud prevention and detection. The goal attribute in our research is:

- Fraud/Default attribute is represented by two modalities: (1) - *fraud_default*, which describes the situation when a lease is terminated because fraud or default occurred; and (0) - *non-fraud* or *non-default* cases which refer to the contracts that were terminated in cases of pre-term repurchase, normal, pre-term termination and harms.

A cluster analysis was performed by using the SOM-Ward algorithm implemented in Viscovery SOMine software. The first step in performing a cluster analysis is to define the map size, training parameters, and a clustering method. The map size is the granularity of the map that is determined by a number of nodes. More nodes require more time for training. For the cluster analysis in this research, a map with 14000 nodes was trained with a normal training schedule. In Viscovery SOMine, the number of clusters should be set before running the SOM-Ward algorithm. Therefore, the algorithm was run with varying numbers of clusters and the most appropriate clustering result was selected using the domain knowledge, by consulting the expert in the field (Uribe & Isaza, 2012). The number of five clusters was determined, and the SOM-Ward clustering method was chosen. In the following steps, the map was explored in order to identify clusters, which are presented in the results section.

Chi-square tests results were used to describe (i) characteristics of clusters according to the characteristics of the leasing contracts, and (ii) characteristics of clusters according to the occurrence of frauds/defaults within clusters.

4 Results

4.1 Cluster identification

The SOM algorithm revealed five clusters in the leasing company dataset. Clusters can be described and clearly distinguished based on all the attributes used for the analysis. Figure 1 shows the self-organising map in which clusters are labelled according to the modal values of the attribute leasing object and the attribute client sector. Since the difference between the clusters is the largest in relation to the leasing objects and industry, clusters were named after them, like the following: Cluster 1 – new cars / trade; Cluster 2 – used trucks and truckboat / other services; Cluster 3 – new machine / construction; Cluster 4 – new motors / trade; and Cluster 5 – new machines and tractors / agriculture.

Table 1 presents the structure of the total number of leasing contracts per cluster. Cluster 1 contains the majority of the leasing contracts (72.18%), and Cluster 5 contains only 1.86% of the total number of leasing contracts.

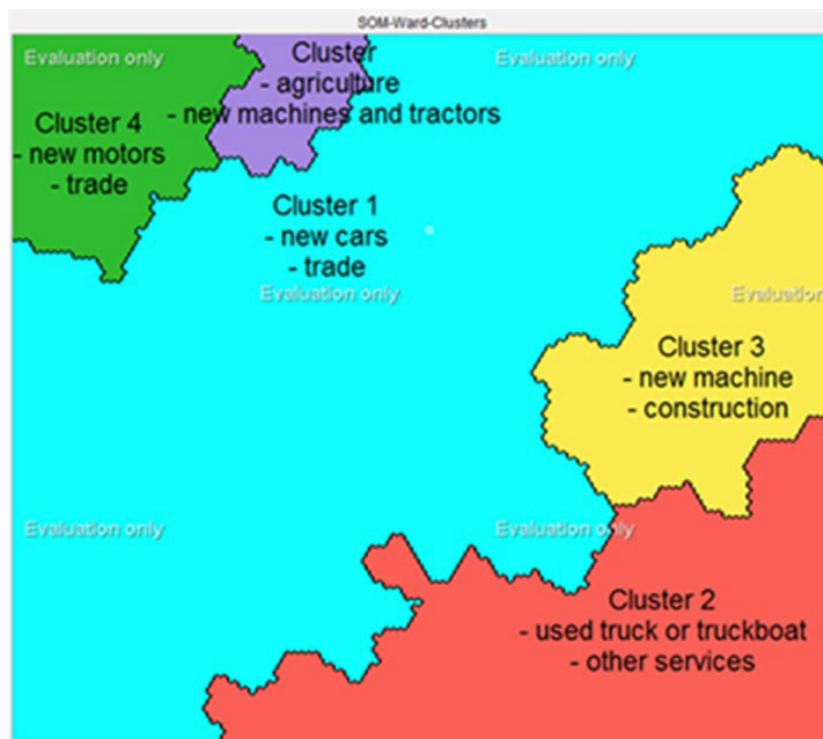


Figure 1: SOM-Ward clusters of clients in leasing. Source: Authors' work based on Viscovery SOMine output

Table 1: Clusters according to the number of leasing contracts

Cluster	Number of leasing contracts in the cluster	% of the total number of leasing contracts
C 1	9425	72.18%
C 2	1828	14.00%
C 3	951	7.28%
C 4	611	4.68%
C 5	243	1.86%
Total	13057	100%

Source: Authors' work based on Viscovery SOMine output

The quantization error is a measure of how well the data vectors from the source data set are matched by a specific node. It is calculated by the average of the squared distance of all data records associated with a node. Averaging over the quantization errors of all nodes yields the quantization error of the map (Viscovery, 2019). The value of the quantization errors (Table 2) suggests that the map is well trained. The errors are distributed evenly over the map.

Table 3 presents the clusters according to the demographic attributes of clients. Clusters differ significantly according to the client sector. For example, in Cluster 1 majority of clients perform trade activities (41.4%). Furthermore, in Cluster 1 companies perform other services (27.9%) and construction activities (17.3%). In Cluster 2 56.2% of clients and Cluster 3 31.4% of clients perform other services. In Cluster 4 46.8% of clients perform trade activities, followed by other services (29%). The agriculture sector is dominant in Cluster 5 (75.35%).

Furthermore, Chi-squares show a significant association between the clusters and the attribute client type as well as associations with the client county. It can be noticed that in all the five clusters there is a high percentage of SMEs, although in Cluster 4 this percentage is the highest. Cluster 5 is distinguished from the others by the highest percentage of sole proprietorships (73.7%).

All the clusters have a high percentage of clients doing business in Zagreb County. However, Cluster 1 clients from Zagreb County are followed by those from Primorje-Gorski Kotar County, and in Cluster 2, 3 and 4 by clients from Split-Dalmatia County. Compared with the other clusters, Cluster 4 contains the highest percentage of clients from Zagreb County. Similarly, Cluster 3 contains the highest percentage of clients from Split-Dalmatia County. It can be noticed that Cluster 5 contains a high percentage of clients from counties that are traditionally related to agricultural activities. The clusters differ according to the demographic characteristics of clients.

Table 2: Training report

Data records: 13057	Attributes: 26	Principal plane: 100:90
Nodes: 14096	Rows: 121	Columns: 117
Schedule: Nrmal	Training cycles: 115	Tension: 0,5
Final errors were:	Normalized distortion: 0,00045	Quantization error: 0

Source: Authors' work based on Viscovery SOMine output

Table 3: Clusters according to client sector, type and county

Cluster	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5	Chi-square (p-value)
Client sector						
Agriculture	5.7%	0.5%		3.1%	75.3%	3411.889 (0.000***)
Chemical	0.3%					
Construction	17.3%	16.1%	43.3%	15.5%	2.1%	
Financial	0.5%					
Other_services	27.9%	56.2%	31.4%	29.0%	5.3%	
Public	2.0%			0.2%		
Tourism	4.9%	0.7%		5.4%	0.8%	
Trade	41.4%	26.5%	25.4%	46.8%	16.5%	
Client type						
Company	75.1%	55.5%	64.7%	80.0%	26.3%	5653.550 (0.000***)
Sole proprietorship	24.9%	44.5%	35.3%	20.0%	73.7%	
Client County						
Bjelovar-Bilogora	1.0%	2.1%	1.1%	0.5%	10.3%	1482.537 (0.000***)
Brod-Posavina	5.1%	3.3%	2.3%	1.0%	2.5%	
Dubrovnik-Neretva	1.3%	1.5%	2.1%	1.8%		
Istria	6.4%	2.0%	4.9%	8.7%	2.5%	
Karlovac	2.2%	3.4%	2.0%	4.7%	1.6%	
Koprivnica-Križevci	1.4%	1.4%	0.5%	1.0%	8.6%	
Krapina-Zagorje	2.0%	3.6%	2.3%	1.0%	1.6%	
Lika-Senj	0.9%	1.0%	2.3%	0.8%	0.4%	
Međimurje	0.9%	1.3%	0.4%	0.7%		
Osijek-Baranja	3.9%	2.7%	3.9%	1.5%	21.8%	
Požega-Slavonia	0.4%	0.6%	0.3%	0.2%	0.8%	
Primorje-Gorski Kotar	13.0%	6.5%	7.6%	7.7%	1.2%	
Sisak-Moslavina	1.6%	3.1%	1.9%	0.7%	4.9%	
Split-Dalmatia	11.1%	15.9%	21.8%	13.7%	2.1%	
Šibenik-Knin	1.0%	2.9%	4.3%	2.8%	0.4%	
Varaždin	3.1%	3.7%	2.0%	1.1%	0.4%	
Virovitica-Podravina	0.4%	0.6%	0.5%	1.0%	9.1%	
Vukovar-Srijem	1.6%	2.4%	1.3%	0.5%	9.5%	
Zadar	1.7%	2.5%	3.9%	2.9%		
Zagreb	41.1%	39.4%	34.5%	47.8%	22.2%	

Source: Authors' work based on Viscosity SOMine output;

Note: ***statistically significant at 1%

Table 4 compares clusters according to the type of leasing object, whether the leasing object was new or used, and the leasing type (financial or operative). As for the leasing object, Cluster 1 is the only one that contains leasing contracts related to cars and light commercial vehicles as

leasing objects. In Cluster 2 those are trucks and tugboats, as well as trailers and semitrailers. Leasing contracts related to machines are assigned to Cluster 3 and Cluster 5 contains only leasing contracts related to agricultural machines and tractors. Cluster 4 is diverse when it comes to

leasing objects, and it included leasing contracts related to machines, forklifts, and vessels.

When it comes to the status of the leasing object, whether it is new or used, it can be noticed that in Cluster 2 the majority of leasing objects are used. In the other clusters, those are mostly new leasing objects with the highest percentage in Cluster 4.

Financial leasing is the most common leasing type in all the clusters. However, the highest percentage of financial leasing contracts is related to Cluster 5 and the highest percentage of operative leasing contracts is related to Cluster 1.

Table 5 compares clusters according to a different client and contract characteristics. When it comes to the status of the client, it can be noticed that in Cluster 5 new clients are in the majority, while in others those are old clients. Within Cluster 3 the highest percentage of the clients has the lowest rating R5, followed by R2. In the other clusters, rating R3 is most common. Finally, according to the attribute client risk, it can be noticed that the leasing company did not have data on the estimated client risk. The highest percentage of fraud or default cases occurred within Cluster 5 (18.55%) and Cluster 3 (17.1%).

Table 4: Clusters according to leasing object and leasing type

Cluster	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5	Chi-square (p-value)
Leasing object						
Agri_forest					100.0%	50454.327 (0.000***)
Cars	66.8%					
Equipment	5.6%					
Forklifts				37.5%		
Light_commercial_vehicles	25.8%					
Machines	0.8%		100.0%			
Motors				40.9%		
Public		3.8%				
Trailers_semitrailers		24.9%				
Trucks_tugboats	1.0%	71.2%				
Vessels				21.3%		
Other				0.3%		
Leasing object New/Used						
New	67%	19.4%	59.4%	84.5%	84%	853.240 (0.000***)
Used	33.1%	80.6%	40.6%	15.5%	16%	
Leasing type						
Financial	64.4%	87.9%	85.8%	86.6%	98.8%	716.436 (0.000***)
Operative	35.6%	12.1%	14.2%	13.4%	1.2%	

Source: Authors' work based on Viscosity SOMine output;

Note: ***statistically significant at 1%

Table 5: Clusters according to client characteristics and fraud/default attributes

Cluster	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5	Chi-square (p-value)
Client new/old						
New	48.5%	44.3%	42.5%	38.6%	67.9%	80.270 (0.000***)
Old	51.5%	55.7%	57.5%	61.4%	32.1%	
Client rating						
R2	2.2%	0.7%	0.7%	1.3%	1.2%	198.575 (0.000***)
R3	43.6%	43.2%	33.2%	38.3%	43.6%	
R4	29.5%	25.6%	22.8%	33.2%	25.1%	
R5	24.7%	30.6%	43.3%	27.2%	30.0%	
Client risk						
No_estimation	63.6%	86.2%	83.3%	85.3%	97.5%	762.799 (0.000***)
No_risk	24.9%	5.5%	6.2%	3.8%		
Risk	11.5%	8.3%	10.5%	11.0%	2.5%	
Fraud/default						
No	89.3%	87.7%	82.9%	90.2%	81.5%	48599.000 (0.000***)
Yes	10.7%	12.3%	17.1%	9.8%	18.5%	

Source: Authors' work based on Viscosity SOMine output;

Note: ***statistically significant at 1%

4.2 Fraud according to client and leasing characteristics

In this section, we present the ratio of fraud/default leasing contracts within clusters.

Table 6 presents details on fraud/default cases in each cluster according to the client sector, the client type, and the client county. Chi-squares results show significant associations between clusters 1, 4 and 5 and the attribute client sector. For example, in Cluster 1 31.8% of fraud/default cases were committed by clients doing business in the trade sector, followed by other services (27.40%) and construction (26.40%), which was significant at 1%. It can be noticed that the clients from the same sectors were fraudsters in Cluster 4 as well, which is also significant at a 1% level.

The client type was shown to be significant when it comes to frauds/defaults for clusters 2, 4 and 5. The highest percentage of SMEs committed fraud in Cluster 4. Sole proprietorships committed the highest percentage of frauds/defaults in Cluster 5.

Additionally, Chi-squares reveal significant associations between frauds in clusters 1, 2, 3 and 4 and the attribute client county.

Table 7 presents details on fraud/default cases within the clusters according to the operational attributes. Chi-squares results show significant associations between frauds and defaults in clusters 1, 2 and 4, and the attribute of the leasing object. In Cluster 1 fraud/default cases are mostly related to cars (62.50%), in Cluster 2 to trucks and tugboats, and in Cluster 4 to forklifts. The status of the leasing object was shown to be significant in Cluster 2 and 5.

Frauds/defaults in Cluster 2 are related to used leasing objects, and in Cluster 5 to new leasing objects. The leasing type is significant for fraud in Cluster 1 and 2.

In Cluster 1 frauds/defaults are related to operative leasing contracts in 57.60% of cases. For Cluster 2 those are financial leasing contracts in 83% cases.

Table 8 presents details on fraud/default cases in the clusters according to the behavioural attributes of clients. The attribute client new/old, and the attribute client risk are significantly associated with fraud/default cases for Cluster 1. New clients mostly committed fraud or default in Cluster 1. The client rating R5 is significant for frauds/defaults in all the clusters.

Table 6: Fraud and default cases according to the behavioural attributes of clients

Cluster	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5
Client sector					
Agriculture	6.7%	1.3%		3.3%	97.8%
Chemical	0.1%				
Construction	26.4%	11.6%	44.4%	30.0%	
Financial	0.6%				
Other services	27.4%	58.6%	30.2%	20.0%	
Public	0.8%				
Tourism	6.2%	0.4%			
Trade	31.8%	28.1%	25.3%	46.7%	2.2%
Chi-square (p-value)	97.087 (0.000***)	6.771 (0.148)	0.142 (0.932)	14.498 (0.013**)	15.050 (0.005***)
Client type					
Company	74.5%	67.0%	68.5%	91.70%	8.9%
Sole proprietorship	25.5%	33.0%	31.5%	8.3%	91.1%
Chi-square (p-value)	0.198 (0.657)	13.527 (0.000***)	1.224 (0.269)	5.636 (0.018**)	8.667 (0.003***)
Client County					
Bjelovar-Bilogora			34.0%	51.7%	26.7%
Brod-Posavina	4.4%		17.9%	3.3%	33.3%
Dubrovnik-Neretva			6.8%	5.0%	
Istria	7.90%				2.2%
Karlovac					15.6%
Koprivnica-Križevci					13.3%
Krapina-Zagorje					4.4%
Primorje-Gorski Kotar	9.8%	4.9%			
Split-Dalmatia	7.5%	6.7%			
Zagreb	44.2%	46.9%			
Chi-square (p-value)	94.452 (0.000***)	52.968 (0.000***)	52.544 (0.000***)	72.064 (0.000***)	18.728 (0.283)

Source: Authors' work based on Viscosity SOMine output;

Note: ***statistically significant at 1%; ** 5%

Table 7: Fraud and default cases according to operational attributes of leasing contracts

Cluster	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5
Leasing object					
Agri_forest					18.5%
Cars	62.5%				
Equipment	4.2%				
Forklifts				65.0%	
Light_commercial_vehicles	31.3%				
Machines	0.8%		17.1%		
Motors				15.0%	
Public		0.9%			
Trailers_semitrailers		36.6%			
Trucks_tugboats	1.3%	62.5%			
Vessels				20.0%	
Chi-square (p-value)	21.916 (0.001***)	22.395 (0.000***)	/	24.635 (0.000***)	/
Leasing object New/Used					
New	70.0%	25.0%	60.5%	86.7%	62.0%
Used	30.5%	75.0%	39.5%	13.3%	38.0%
Chi-square (p-value)	3.327 (0.068)	5.079 (0.024**)	0.103 (0.749)	0.249 (0.618)	19.352 (0.000***)
Leasing type					
Financial	42.4%	83.0%	81.5%	86.7%	100.0%
Operative	57.6%	17.0%	18.5%	13.3%	
Chi-square (p-value)	239.348 (0.000***)	5.707 (0.017**)	2.973 (0.085)	0.000 (0.983)	0.690 (0.406)

Source: Authors' work based on Viscosity SOMine output;

Note: ***statistically significant at 1%; ** 5%

Table 8: Fraud and default cases according to behavioural attributes of clients

Cluster	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5
Client new/old					
New	60.1%	44.2%	42.6%	43.3%	82.2%
Old	39.9%	55.8%	57.40%	56.7%	17.8%
Chi-square (p-value)	61.095 (0.000***)	0.001 (0.971)	0.000 (0.985)	0.622 (0.430)	5.197 (0.023**)
Client rating					
R2	0.2%				
R3	1.7%	4.50%	0.6%	1.7%	2.2%
R4	4.9%	3.10%		1.7%	
R5	93.2%	92.40%	99.4%	96.70%	97.8%
Chi-square (p-value)	2861.991 (0.000***)	459.771 (0.000***)	250.596 (0.000***)	162.408 (0.000***)	120.594 (0.000***)
Client risk					
No_estimation	48.6%	83.9%	78.4%	83.3%	100.0%
No_risk	38.5%	5.4%	9.3%	3.3%	
Risk	12.8%	10.7%	12.3%	13.3%	
Chi-square (p-value)	127.931 (0.000***)	1.928 (0.381)	4.093 (0.129)	0.402 (0.818)	1.398 (0.237)

Source: Authors' work based on Viscovery SOMine output;

Note: ***statistically significant at 1%; ** 5%

4.3 Summary of cluster characteristics in relation to fraud

Based on our research, this section provides the characteristics of clusters according to characteristics of leasing contracts and fraudulent behaviour occurrence. It also presents the occurrence of fraud in relation to the type of vehicle.

Cluster 1 - New cars / Trade. Cluster 1 contains the largest percentage of clients doing business in the trade sector (41.4%). It is also the only cluster in which clients are interested in cars as leasing objects (66.8% of clients), but it also consists of clients that are interested in light commercial vehicles (25.8% of clients). The leasing object is new in 67% cases, reflecting the fact that the new cars are an object of the majority of the leasing agreements. Leasing contracts of this cluster were financial in 64.4% of cases. In this cluster, clients are also mostly small or medium companies (75.1%) from Zagreb County (41.1%), and they are old company's clients (48.5%). Their rating is on average R3, and their risk is not estimated (63.6%).

More than 10% of leasing contracts in this cluster were fraudulent. In 93.20% of cases, fraudsters had low client rating R5. Therefore, when it comes to fraudster profiles, leasing companies should take care of new clients that do

business in trade, other services and construction in Zagreb County. Additionally, a client's risk in 48.6% of cases was not estimated, or they were no risky clients (38.5%). Operative leasing contracts were prone to risk, and they were related to cars and light commercial vehicles. An additional analysis showed that VW, Peugeot, and Citroen vehicles are riskier than the other vehicle brands.

Cluster 2 - Used trucks or tugboats / Other services. Clients in Cluster 2 perform business in other services or trade (82.7%). This is the only cluster in which clients are interested in trucks and tugboats (in 71.2% of cases) as well as trailers and semitrailers (in 24.9% of cases). Most of the leasing objects are used (80.6%), and 87.9% leasing contracts are financial. Furthermore, more than half of the clients in this cluster are from Zagreb or Split-Dalmatia County. When it comes to behavioural attributes of a client, 55.7% of them in this cluster are old clients. Their risk is not estimated in 86.2% of cases. Client rating in this cluster is R3 in 43.2% of cases, but there is also a large proportion of clients with low rating R5 (30.6% of cases).

In Cluster 2 12.3% of leasing contracts were fraudulent. An analysis of fraudulent cases for this cluster showed small and medium companies were fraudsters in 67% of fraud cases, and they were mostly from Zagreb County (46.9%) with rating R5. Additionally, used vehicles as well as trailers and semitrailers, especially MAN

trucks, were the object of most of the fraud cases. Financial leasing contracts are especially risky in this cluster.

Cluster 3 - New machinery / Construction. Cluster 3 is the one with the largest percentage of clients doing business in the construction sector (43.3%), followed by other services and trade. Most of the clients are small or medium companies (64.7) in Zagreb or Split-Dalmatia County. Machines are the only type of leasing objects in this cluster, and they are new in 59.4% of the cases. The leasing contracts are financial. In this cluster, clients are known to the company from previous agreements (57.5%). This is the cluster with the highest percentage of R5 rated clients (43.3%), but their risk is not estimated (83.3%).

This cluster has a high percentage of fraud/default cases (17.1%). Clients from the construction sector committed 44.4% of fraud cases. Fraudsters are from Bjelovar-Bilogora County in 34% of cases, and their rating is R5.

Cluster 4 - New motors / Trade. Cluster 4 has the highest percentage of clients doing business in the trade sector (46.8%) followed by other services (29%). In 80% of cases, those are small or medium companies, and in more than 60% they are from Zagreb or Split – Dalmatia County. These companies are interested in motors (40.9%) and forklifts (37.5%) as leasing objects, especially new ones. Financial leasing contracts are the main type of leasing in this cluster. When it comes to behavioural attributes of clients, in this cluster, clients are mostly old clients, with the average rating R3 or R4.

This cluster has the lowest fraud rate of all the clusters (9.8%). Fraudulent cases are related to small and medium companies from Bjelovar-Bilogora County with an R5 rating. They also do business in the trade or the construction sector. In 65% of cases, the leasing object in fraudulent leasing contracts is a forklift.

Cluster 5 - New machinery and tractors / Agriculture. Clients in Cluster 5 do business in the agricultural or the trade sector. Sole proprietorships are the main type of clients. This is the only cluster in which agricultural machinery and tractors are objects of leasing contracts. Additionally, leasing objects are new in most cases. The primary type of leasing is financial. This can be explained by the fact that agricultural sole proprietorships, in reali-

ty, want to keep machinery and tractors for a longer term, after the termination of a lease. This cluster contains the largest percentage of new clients without a risk estimation.

Furthermore, this cluster contains the largest percentage of fraud cases (18.5%). Frauds are likely to be committed by new, low rated agricultural proprietorships interested in new agricultural machinery and tractors.

5 Practical recommendations

In order to check the validity of our approach, we asked experts from leasing companies to evaluate whether the observed results are useful to them and whether they are in line with their observations in practice. In our research, we followed the approach of Osei-Bryson (2010), who used expert evaluation of clustering results in one data mining application. We asked four experts, from four different Croatian companies, to provide their opinion in relation to the cluster characteristics. They confirmed that the given results are applicable in their day-to-day business operations, as well as tactical and strategic planning.

Finally, with the support of experts, we have developed Table 8, which presents the summary of the characteristics of fraudulent contracts within each cluster, which can be useful to leasing companies in their development of fraud prevention and detection programmes. The table presents the characteristics of leasing contracts within clusters, which have been proved as statistically significant and thus useful for the identification of fraudulent clients. For example, fraud occurs most often in Cluster 1 with the construction industry, other sectors, and trade, which is significant at 1%.

There are several practical recommendations that could be derived from Table 9. For example, companies should take special care of the clients coming from the construction industry, other services and trade, which operate in Zagreb County, with new cars and light commercial vehicles as leasing objects, especially if the operative leasing is used. Similar recommendations could be derived from other clusters.

Table 9: Fraud or default profiles within clusters

Cluster	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Cluster 5
Client sector	○ (1%, construction, other, trade)	/	○ (5%, construction, other, trade)	○ (5%, trade, construction, other)	○ (1%, agriculture)
Client type	/	○ (1%, SME)	/	○ (5%, SME)	○ (1%, sole proprietorship)
Client County	○ (1%, Zagreb)	○ (1%, Zagreb)	○ (1%, Bjelovar-Bilogora, Brod-Posavina)	○ (1%, Bjelovar-Bilogora)	/
Leasing object	○ (1%, cars and light commercial vehicles)	○ (1%, trailer semitrailer; truck_tugboat)	/	○ (1%, forklift)	/
Leasing object (New/Used)	/	○ (5%, used)	/	/	○ (1%, new)
Leasing type	○ (1%, operative)	○ (5%, financial)	/	/	/
(Client new/old)	○ (1%, new)	/	/	/	○ (5%, new)
Client rating	○ (1%, R5)	○ (1%, R5)	○ (1%, R5)	○ (1%, R5)	○ (1%, R5)
Client risk	(1%, no_estimation; no_risk)	/	/	/	/

Source: Authors 'calculations and Viscosity SOMine output;

Note: ○ Statistically significant at 1% and 5%; / - no significance

6 Conclusions

The objective of this work is to shed some light on the area of fraud in the leasing industry, with support of the data mining approach utilizing cluster analysis with self-organising maps. Research goals were: (i) to investigate whether SOMs is an appropriate method for identifying and describing clusters of clients in the context of the leasing industry; (ii) to detect specific attributes that could explain the fraud in the leasing industry.

We applied the SOM algorithm with the usage of Viscosity SOM software on a database of one Croatian leasing company, which resulted in the identification of five clusters of leasing contracts according to their characteristics, such as the client sector, the leasing object, and the leasing type. The application of the SOM algorithm resulted in the extraction of five clusters, with the significant differences in relation to the leasing contract characteristics. We have asked several experts from other leasing companies to evaluate the usefulness of our results. They have confirmed that the results are in line with their observations, as well as the practices of their companies. Therefore, the usage of the SOM-Ward algorithm with the support of Viscosity SOMine software proved to be useful for the cluster analysis of the clients of the leasing company, which indicates a positive answer to our first research question.

In order to detect specific attributes that could explain the fraud in the leasing industry, the clusters were inter-

preted according to all clustering and other attributes used for the analysis. We used Chi-Square tests in order to detect a significant association between attributes' modalities and the occurrence of fraud and default cases within each of the clusters. Based on our results, we identified fraudster profiles based on the attributes that explain committed frauds or defaults.

Our work indicates the potential practical implications. Although our work is based on a client database from one Croatian leasing company, the expert evaluation of the clustering results indicates that other leasing companies could also benefit from the developed fraudster profiles. In addition, other leasing companies could develop their own analyses, based on the same methodology and implement fraud alert mechanisms in their client databases. This means that they also can increase their efficiency and effectiveness by creating customised business strategies for different clusters of clients. The findings of this paper can be used for further adaptation of the methodology in fraud profiling in contexts of different industries.

However, several limitations should be taken into account when it comes to this research. First, we focused only on small and medium companies and sole proprietorships in one industry. Second, data are provided only by one leasing company. Therefore, future research should include data provided by more companies in order to enhance the robustness of the results. Additionally, the methodology should be tested in the context of other industries, such as insurance. Testing the proposed method on other

case studies and industries could enhance the robustness of the results.

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Preprečevanje goljufij pri lizingu z uporabo Kohonen-ovih samoorganizirajočih zemljevidov

Ozadje in namen: Tehnike rudarjenja podatkov se intenzivno uporabljajo v različnih panogah za preprečevanje in odkrivanje goljufij. Raziskav, ki se osredotočajo na lizing industrijo, je malo, čeprav se goljufije na tem področju pojavljajo precej pogosto. V študiji najprej identificiramo grozde poslovnih strank v izbrani lizingni družbi po metodi samoorganizirajočih zemljevidov, ki temeljijo na atributih lizing pogodb. Nato primerjamo grozde na podlagi prisotnosti goljufivih strank, da bi razvili profile prevarantov.

Zasnova / metodologija / pristop: Za odkrivanje značilnosti goljufivih strank smo uporabili bazo strank, ki vsebuje attribute lizingnih pogodb ene od hrvaških lizingnih družb. Za razvoj profilov goljufivih odjemalcev smo uporabili postopek združevanja s Kohonen samoorganizirajočimi zemljevidi, ki jih podpira programska oprema Viscosity SOMine.

Rezultati: Identificirali smo pet skupin in jih označili v skladu z modalnimi vrednostmi atributov, ki opisujejo predmet lizinga in panogo, v kateri stranka posluje: (i) novi avtomobili / trgovina; (ii) rabljeni tovornjaki ali vlačilci / druge storitve; (iii) novi stroji / gradbeništvo; (iv) novi motorji / trgovina; in (v) novi stroje in traktorji / Kmetijstvo.

Zaključek: Samoorganizirajoči zemljevidi so se izkazali kot uporabna metodologija za razvoj profilov goljufivih strank v lizingnih družbah. Podjetja lahko naše rezultate za ciljno spremljanje strank iz opredeljenih panog, ki kupujejo specifične lizing predmete. Poleg tega lahko podjetja uporabijo našo metodologijo v lastnih bazah podatkov, da razvijejo profile prevarantov za njihove posebne namene in v svoje baze podatkov strank vgradijo mehanizme za opozarjanje na goljufije.

Ključne besede: prevara, zakup, Kohonenovi samoorganizirajoči zemljevidi, Viscosity SOMine, Ward algoritem, Hrvaška, rudarjenje podatkov

The Effect of Statistical Literacy on Response to Environmental Change

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Background and Purpose: Due to constant social, technological and economic change, social actor, interacting with environment, is constantly faced with the need to acquire new knowledge and develop different competences – field of statistics included. The latter, with development of statistical literacy, enables one to reflectively analyse environment and respond to its changes. The aim of this paper is to determine response effectiveness of a better statistically literate social actor to environmental changes from perspective of different generations in Slovenia.

Design/Methodology/Approach: Empirical data was collected through a survey questionnaire, processed and analysed using chosen descriptive and inferential statistical methods. 1239 respondents of all three Slovenian generations participated. Two research questions were asked, one relating to the whole sample and the other to three subsamples according to age groups and generations.

Results: Based on whole sample of all three generations, it can be concluded that statistical literacy influences responsiveness of social actor to environmental changes. Survey results show that better statistically literate social actors are more completely and actively involved in working environment, personal and social life and respond to environmental changes more effectively.

Conclusion: More attention, on urgency to develop statistical literacy individually in professional and everyday life, should be put on raising awareness of statistical knowledge importance to cope with environmental changes and improving supply and accessibility of formal and informal forms of statistical education for all generations.

Research results will also contribute to better planning and implementation of statistics education at the level of educational institutions and teachers of all three generations.

Keywords: *environmental change, statistics, statistical literacy, social actor, education, generations*

1 Introduction

Change is the only constant of social and technological development. Turbulent environment we live in requires constant change, both on an individual level - social actor, generation and social level as a whole. Dynamics of social change require rapid responsiveness of social actor, who empowered with statistical knowledge and competence, should respond to social, economic and technological development. In knowledge society highly qualified experts - including those with statistical knowledge, will have to proactively enter lifelong learning and statistics education »throughout their lives« and »for all life dimensions«; so

they could appropriately statistically literate be able to face current social changes more effectively.

Appropriate statistical knowledge is also relevant to managers in decision-making in production and economic systems, conditioned by implementation of innovation projects, economic and mathematical models and methods of process management based on mathematical apparatus and statistical data (Mylnikov, 2016). Use of statistical methods, as a support system for decision making in small enterprises, can lead to better business results (Žmuk, 2015). Managers and other professionals with business experience should consider relevant statistics for optimal decision-making on complex capital budgeting decisions and accounting issues (Wainberg, 2018). Furthermore,

managers in industrial processes need knowledge of statistical techniques in modeling and optimizing data to improve quality of industrial processes (Sant'Anna, 2015).

Statistical tools are key components of quality management support and production process analysis, enabling managers to anticipate business and production conditions in different ways (Orzes & Bo', 2019). Knowledge of methodology is vital for project managers to be able to evaluate their project in terms of measurement instrument use and to analyze results of method used (Kononenko & Lutsenko, 2019). The same applies to other specific management areas, such as strategic management in the field of forest resources, which requires use of analytical methods to maximize function and value of forests (Grošelj, Hodges & Zadnik Stirn, 2017). That is why the challenge of future commercial prospects, which increasingly take into account data in decision-making, and thus consequently affects changed DNA and performance of organizations, is in changing mindset and way of thinking of managers and other employees (Carillo et al., 2019).

In researching statistical literacy and responding to social change in today's long-lived society, characterized by most developed societies, one may wonder whether it is sufficient to focus solely on the level of social actor, or whether it is sensible to upgrade research to the level of generations. As Bolin (2019) points out it is not enough to understand social change by focusing solely on just one generation, three generations - young, middle-aged and elderly - were included in our study.

In order to understand the complexity of systematically organized research background, two determinants should be highlighted. The first explaining that statistical knowledge and statistical literacy development among Slovenian generations are weak, confirmed also by some international researches. Researches¹, involving young learners in the past two decades, have shown they lack knowledge of data processing/statistics (Ferligoj, 2015; Lipič, 2015). Quality Indicator for adult knowledge, measured by achievements in 1998 The International Adult Literacy survey (the last survey where Slovenia participated), ranks us last among participating countries (Dovžak et al., 2014). The study included areas of reading, writing and numeracy, which also covers statistics.

Second determinant relates to provision of formal and informal forms of statistics education in Slovenia for all generations, including the elderly. Research by Lipič (2015) shows statistical training is very modest or nonexistent in some professional and subject areas. The latter is mainly for young generation, less for the middle-aged and almost none for the elderly. Our research focuses on statistical literacy issues in Slovenia in times of social change as various experts, over the past few decades, have been

repeatedly warning us of lack of statistical knowledge and poor development of statistical literacy of individual Slovenian generation.

The starting point for our research is conscious reflection of educational environment in Slovenia to improve statistical literacy, which poses a challenge for a more effective response of social actor from individual generations to environmental social changes. Nowadays, the needs of all three generations for lifelong learning and statistics education require a new paradigmatic shift in individual awareness towards enhancing competence in statistical knowledge to understand complexity and variety of environmental changes.

The main objective of this paper is to determine response efficacy of a better statistically literate social actor to environmental changes from the perspective of different generations in Slovenia.

Two research questions are:

- Which factor educational barrier, statistical literacy and competence of education system, has the biggest influence on social actor's responsiveness to environment changes?
- Which factor educational barrier, statistical literacy and competence of education system, has the biggest influence on social actor's responsiveness from specific generation to environmental changes?

2 Theoretical framework

2.1 Complexity of change in social and educational environment

The following section presents theoretical framework for understanding complexity and dynamics of change a social actor faces in environmental interactions. In the next section, the need to cope and respond to changes in social and educational environment will be upgraded with context of individual's needs for involvement in statistics education and statistical literacy development by applying these findings.

According to Holloway (2010, 12), social change is the result of barely visible transformation of daily lives and activities of millions of people. It is every human being's responsibility to oppose to or reject things in one's life s/he believes damage the quality of one's life and possibility of personal growth in this changing society (Earl, 2014). Social change is any action, progressive or regressive, effective or ineffective, aimed at changing outcomes (Pratto, Stewart, & Bou Zeineddine, 2013, 139).

As early as the 1960s, Vaizey (1961, 7) wrote that relationships between economic growth, social change and in-

¹ IAEP, School Children's Acquisition and Maintenance of Quantitative Thinking in Mathematics, PISA, TIMSS.

vestment in education were important and complex. Nowadays, Erol (2011) adds that education itself does not play a major role in the process of social change, as economic, political, and other positions of power in society are predominant. However, education in a holistic understanding of social change is one of the indispensable factors, as it provides opinions, directions, forms and theories of social change.

Education promotes social change, which is mirrored differently in different environments by different social and political backgrounds, philosophical reasoning and educational approaches. These different approaches to social change are mirrored on the level of participant, financial support of governments and organizational system (Chang, 2013). Creative social change promotes a uniquely connected dialogue between leadership, sustainability, the long-term survival of our planet and organizational development (Schuyler Goldman & Jironet, 2016). Education influences faster development of an individual and, at the same time, higher efficiency of all organizational structures, as when education is discussed, development of individual achievements are in question (Drucker, 2001, 59).

New technologies and emergence of knowledge economy have changed traditional concept of work and education, so lifelong learning and gaining qualifications today last a lifetime not just in certain stages of life. We cannot prepare for a successful life in an ever changing world and cope with change only once in our lives, in childhood and adolescence, we should constantly learn in terms of »lifelong« and »lifewide«, therefore, lifelong learning is increasingly becoming a guiding principle and basic social development strategy of education and learning. Nowadays, one's learning is not only a starting point for job promotion, but also the ability to successfully cope with social change, as learning should become an entity of one's everyday life and an expression of one's lifestyle and identity for success in society.

The ability to adapt to social transitions is a challenge for schools, which should go beyond outlived socialization of students on the status quo level and strive to educate students who are proactive actors of social change (Trotta Tuomi, 2005). In modern schools, moving away from capitalist orientations, social change should mirror construction of cultural pluralism, redistribution of socio-economic status and sociocultural recognition of identities and differences (Rodrigues, 2012). Social change ensures that social cultural values are passed on to future generations, thereby contributing to existence and preservation of social tradition. In times of rapid change, even education faces such change as cultural heritage of society passes through education onto next generation (Turhan, 2005).

Social change should stem from and be realized within a family before they can change others as in a socially constructive paradigm, a family forms a community and more families form a nation (Alden Rivers, Hazenberg, & Bajwa-Patel, 2015). Participation of young people in so-

ciety, and coping with social change, is essential for promoting young people's identity as citizens within a democratic context, developing their skills in useful situations and supporting their personal development (Checkoway, 2011). Through participation, young people enter intersection of social events and become catalysts for positive social change (Nejati, Pourezzat, & Gholipour, 2012, 411).

2.2 Importance of statistical literacy in a society of change

Understanding technological, financial and social changes is also conditioned by understanding their statistical context. Therefore, theoretical framework, focusing on whole population or partially on individual age groups of learners, is discussed. This will help us understand statistical literacy needs from perspective of individual generations. Such complex researches are rare.

In globalization, statistics play an important role in different human activities as it is used in various social, economic, industrial, educational and other fields (Takarria & Talakua, 2018, 396). Statistics infiltrate and affect every aspect of our lives as media and advertisements try to influence our views and responses. Statistics play an increasingly important role in understanding social and economic development and progress (Feng et al., 2011, 90). Therefore, the importance of statistical literacy in modern society is essential as it has now become a key reading and writing competence (Baniyas, 2017, 980). The focus on statistical literacy has increased over the past two decades (Budgett & Rose, 2017, Callingham & Watson, 2017; Watson, 2013) as the construct of statistical literacy continues to evolve with social change, posing a challenge to educational systems and teachers (Gal, 2019).

Statistical literacy means understanding and using basic statistical language and tools: knowing what basic statistical terms mean, understanding simple use of statistical symbols, recognizing and being able to interpret different data representations. Statistical literacy is defined as a key competence expected of citizens in information societies, is often promoted as expected outcome of schooling and is a necessary component of literacy and adult numeracy (Garfield, 2011).

Statistical literacy is a concept recently attracting a great deal of research interest among statistical education researchers regarding its elements (Contreras & Molina-Portillo, 2019). Ferligoj (2015, 6) sees success for improving statistical literacy in coordinated collaboration of educational institutions, statistical offices, statistical associations and the media.

One of basic arguments of statistical literacy is that individuals are literate for their roles as citizens in society (Weiland, 2017, 34). Today, good command of statistics is also required to evaluate, identify issues and support when selecting interventions, predict future, monitor progress

and evaluate results and impacts of policies and programs (Sanga, 2011, 1262). As stated by Nicholson, Ridgway, and McCusker (2013) and Wild (2017), statistical culture is constantly changing, new forms of communication and discourse, new forms of visualization and human interaction with data mean that what may have been useful a few years ago is no longer adequate.

Use of statistical information is becoming increasingly important for citizens in carrying out their professional and private activities and is essential for their active participation in society. It is difficult to understand various economic and social processes without use of statistics in today's complex world (Todorova, 2018, 390). Use of misleading heuristic-based graphics can often be identified when presenting information in the media, which prevent the user from realizing one is being misled (Contreras et al. 2017; Sutherland & Ridgway, 2017). Statistically literate people, who know how to understand, interpret, and evaluate statistics, will also be able to use these skills to plan future actions with compelling arguments and contribute to evidence-based policy development (Baniyas, 2017, 974).

According to Weiland (2017, 34), social change dictate changes in teaching mathematics or statistics, as Auliya (2018) specifies, general perception of mathematics and statistics influences students' statistical literacy skills. Weiland (2017, 34) continues to say that school mathematics curricula, where statistical education is firmly rooted, should also address and explore large-scale socio-political issues such as systemic racism, class distinctions, climate change, refugee crisis, immigration, poverty, food shortages, waste and environmental pollution. From this perspective, Weiland (2017, 40) expands the concept of statistical literacy with the concept of critical literacy and defines the concept of critical statistical literacy. This contributes to students as critical citizens, supported by learning powerful statistical concepts and practices, address complex socio-political issues (Weiland, 2017, 45).

Engel (2019) finds the answer to the question of how we can prepare students to understand statistical data and look at trends and changes on key social issues, such as demographic change, crime, unemployment, fair wages, migration, health, racism and other social fields, by expanding the notion of statistical literacy into civic statistics. Nicholson, Gal, and Ridgway (2018) outline eleven aspects of statistical literacy that define civic statistics when answering social questions. They are essential for social policies, as both statistical knowledge and social or socio-economic context are required. From this perspective, Nascimento (2019) explains statistical literacy as one of important competences also needed to understand and achieve the UN Sustainable Development Goals 2030. These goals require global action by governments, enterprises and civil societies in tackling social inequality, poverty, climate change, peace, security, human rights, environmental protection and allowing a decent life and opportunities for all.

Statistics play an important role in the digital economy, which plays an increasingly important role in transformation of almost all parameters of modern society today. At the forefront are challenges incurring in the process of digitalization of manufacturing and management activities within economy, which is based on widespread use of digital technologies. That is why it is important to encourage development of modern personnel for digital economy, without which it is practically impossible to achieve significant increase in social production efficiency (Karmanov & Klochkova, 2018, 78).

In Slovenia too, increasing role of statistics in information society raises importance of statistical literacy, defined as ability of users to use and transmit statistical information in an appropriate and professional manner. In past decades, major part of statistical education with development of statistical literacy, statistical reasoning and statistical thinking, has been implemented mainly in primary and secondary schools. Today, more attention is put on quality statistical education of students in Slovenia. The Brezavšek, Šparl and Žnidaršič (2014) survey, carried out with the help of the Technology Acceptance Model, offers guidance to social science education lecturers to understand and use SPSS program better. Above all, future task of educational institutions, statistical institutions, statistical societies and other actors in the field of statistics, is to improve statistical literacy of different social classes (Ferligoj, 2015, 8-9).

In our modern mass societies, knowledge and skills, properly supported by data, are an important prerequisite for democracy to work. In an increasingly complex world, citizen's input is an important resource for national and local policymakers. In doing so, public debate is based on facts rather than emotions and promotes evidence-based policymaking (Engel, 2016).

In the light of democratization, an independent movement, The Radical Statistics Group, which has for the past four decades included mainly English statistics, researchers and interested citizens, has been advocating the use of statistics in support of progressive social change. (Evans & Simpson, 2016).

Statistical literacy is generally important for full social participation (Steen, 2001) and informed citizens (Tractenberg, 2017). In modern knowledge society, use of statistical information is a necessary skill for citizens (Todorova, 2018). In a society of change, which offers substantial amount of information at any given moment, recipients of information, published in various media, are expected to become active citizens who will understand statistics of the public sphere (internet, press, radio, television, producers of official statistics, etc.) and know how to verify all based on their own knowledge, which includes context knowledge, basic mathematics, knowledge of (at least) elementary statistics, graphical and numerical tools suitable for presenting data with critical thought and willingness to accept evidence. Therefore, it is necessary to integrate ba-

sis elements of statistical education into mathematics curricula so that citizens are adequately statistically educated (Contreras & Molina-Portillo, 2019).

3 Methodology

3.1 Methods, techniques for collecting and processing data

Research into effectiveness of response of statistically literate social actors from different generations in Slovenia on environmental changes was carried out using relevant quantitative methodology. Descriptive and inferential statistical methods were applied.

Statistical analysis of empirical data, collected through our own questionnaire in 2015, was performed using the SPSS program (version 21). Properties of variables were analyzed and presented in tables together with frequencies, arithmetic means and standard deviations.

Data was collected in 2015. It was collected by a written survey of 1st year students of Physical Therapy and Social Gerontology courses at Alma Mater Europaea - European Center, Maribor. According to individual generations, all other students' family members were also included in the study. Students were interviewed before methodological approach was done.

Multivariate statistical methods were used in statistical analysis, namely factor analysis using principal axis factoring (PAF). The significance of factor analysis use was tested by the Kaiser-Meyer-Olkin criterion (KMO) of sample adequacy, which measures strength of overall correlation between variables (homogeneity) of variables, and Bartlett's Test of Sphericity, which serves to verify whether there is statistically significant difference between our inter correlation matrix and the unit matrix. By performing individual factor analyses for each four sets of indicators used in this paper, substantive validity of each construct was confirmed and new variables for further analysis were obtained.

Cronbach's alpha coefficient was used to evaluate reliability of measurement or to evaluate internal consistency of measurement scale.

Multiple linear regression analysis was also used to explain influence of independent variables on dependent variable. When determining relationship between dependent and multiple independent variables, regression model was used, where values of independent variables were used to predict value of dependent variable in the entire sample and three subsamples according to age group or generation.

3.2 Description of instrument

The empirical data was collected by using our own questionnaire, which is the result of studying relevant literature and synthesizing all these insights into final theoretical construct. Participating respondents in the survey were voluntary and anonymous. Ethical survey principles and standards were followed.

In January 2015, a pilot survey of adequacy and reliability of questionnaire as an instrument for empirical data collection was performed on a sample of twenty-four people, eight from each generation.

Paper presents complex research results with a large survey questionnaire. On average, respondents answered it within 30 minutes. Only data relevant to research presented was applied. Questionnaire included close- and open-ended questions.

Measurement scale has five values (Likert scale), where 1 indicates respondent's position as very unsupportive and 5 respondent's position as very supportive. All statements, used in multivariate analyses, were measured using this ordinal scale.

The questionnaire consists of three completed units. The first includes questions about respondents' demographics. The second consists of question of participation in education in statistics. The third consists of a set of statements related to statistical literacy identifying respondents' points of view from various research aspects.

3.3 Sample

In identifying response efficacy of better statistically literate social actors from different generations in Slovenia to environmental changes, the perspective of all three generations was applied: young generation, aged 18 - 25, the middle-aged, 26 - 64 and the elderly, aged 65 and over. In defining individual generation age limits, Slovenian cultural milieu was taken into consideration and only Slovenian experts' interpretations were used. In younger generation, the lowest age consent, i.e. 18, was acknowledged.

Two-stage sampling was designed. The first used stratified sampling, as population was divided according to age criteria into individual generations. This was followed by convenience (casual) sampling within each individual generation.

Survey included 1239 respondents: 409 from younger generation, aged 18 to 25, 452 were middle-aged (26 to 64) and 378 were elderly thus aged 65 years or older. Our sample does not represent the distribution of entire population of Slovenia.

4 Results

4.1 Descriptive Statistics

To understand basic demographic characteristics of respondents' age, gender and educational structure should be analyzed separately for each generation.

Age structure of survey sample (Table 1) shows that 33% of respondents are from the young generation, i.e. 18 - 25 years, 36.5% are middle aged (26 to 64) and 30.5% are elderly, aged 65 years or over.

55.3% female respondents and 44.7% male respondents

were included in the survey (Table 2). This is comparable to Slovenian population also dominated by women. Young generation consists of 57.2% female respondents and 42.8% male respondents, middle-aged includes 54.9% female and 45.1% male respondents and 53.7% female and 46.3% male respondents are from the elderly generation.

Educational structure of respondents by generations (Table 3) indicates that majority of respondents of all three generations completed high school. College education follows in the young and middle-aged, vocational in the elderly generation. Third place is vocational in the young and the middle-aged, primary education in the elderly generation.

Table 1: Age structure of respondents by generation.

Generation	<i>f</i>	<i>f</i> in %
18–25 years	409	33.0
26–64 years	452	36.5
65 years or older	378	30.5
Total	1239	100.0

Table 2: Gender structure of respondents by generation.

Gender	Generation					
	18 to 25		26 to 64		65 and over	
	<i>f</i>	<i>f</i> in %	<i>f</i>	<i>f</i> in %	<i>f</i>	<i>f</i> in %
Female	234	57,2	248	54,9	203	53,7
Male	175	42,8	204	45,1	175	46,3
Total	409	100,0	452	100,0	378	100,0

Table 3: Educational structure of respondents by generation.

Education	Generation					
	18 to 25		26 to 64		65 and over	
	<i>f</i>	<i>f</i> in %	<i>f</i>	<i>f</i> in %	<i>f</i>	<i>f</i> in %
No education	0	0,0	1	0,2	12	3,2
Primary school	27	6,6	18	4,0	79	20,9
Vocational school	36	8,8	62	13,7	82	21,7
Secondary school	269	65,8	162	35,8	104	27,5
College	12	2,9	51	11,3	43	11,4
Higher school	16	3,9	42	9,3	15	4,0
University	43	10,5	85	18,8	29	7,7
Specialization	0	0,0	6	1,3	4	1,1
Master	6	1,5	15	3,3	5	1,3
Doctorate	0	0,0	10	2,2	5	1,3
Total	409	100,0	452	100,0	378	100,0

In order to understand response efficacy of social actor from individual generations to environmental changes, structure of respondents according to participation frequency in statistical knowledge course in the past three years and especially in 2014 is presented (Table 4). When participating in statistics education, formal and non-formal education were included. 2014 was chosen as survey was conducted in 2015. Structures are presented separately for all three generations.

Results show that respondents aged 18 to 25, most frequently attended statistics course in 2014 and the past

three years. The lowest participation in statistics course in the past three years and in 2014 is, as expected, among respondents from the older generation, aged 65 and over.

In the past three years, 39.9% of young generation respondents, 23.7% of middle-aged and 6.3% of old generation attended statistics course.

In 2014, 27.1% of young generation respondents, 16.2% of middle-generation respondents and 6.3% of old-generation respondents attended statistics course.

Table 4: Participation frequency of respondents of different generations in statistical training in the past three years and in 2014.

Participation	Generation					
	18 to 25		26 to 64		65 and over	
	Last three years	In 2014	Last three years	In 2014	Last three years	In 2014
	<i>f</i> in %	<i>f</i> in %	<i>f</i> in %	<i>f</i> in %	<i>f</i> in %	<i>f</i> in %
Never	60,1	72,9	76,3	83,8	93,7	93,7
Once a year	18,6	12,0	11,7	8,8	2,6	3,2
Twice a year	3,7	3,9	4,9	2,9	1,6	1,6
Thrice a year	5,1	3,9	2,9	1,5	0,8	0,5
Four times a year	2,7	1,0	0,4	0,4	0,5	0,0
Five or more times per year	9,8	6,4	3,8	2,4	0,8	1,1
Total	100,0	100,0	100,0	100,0	100,0	100,0

4.2 Factor analysis

Using Principal Axis Factoring (PAF) method, factor analysis reduced number of variables by introducing synthetic variables or factors.

Below only a part of a complex survey, identifying eight factors of lifelong statistical education from different generations' perspective in Slovenia, is presented. The paper focuses only on four factors that are relevant to our two research questions. Table 5 shows results of each factor analysis for each one of four sets of indicators used in this paper to confirm substantive validity of each construct and obtain new variables for further analysis. These factors are "response to change", "statistical literacy", "educational barriers" and "competence of the education system". Factors "response to change" and "statistical literacy" include seven, "educational barriers" factor nine and "competence of the educational system" factor five variables.

Results in Table 5 show that all four factors can confirm, using KMO and Bartlett's test, data adequacy for factor analysis. KMO ratios are in all cases greater than 0.5 and with risk less than 0.05 null assumption that correlation matrix is equal to unit matrix (Bartlett's Test of Sph-

ricity) can be rejected. On this basis, confirmatory factor analysis followed confirming for each four constructs that one factor was obtained, where factor loadings were everywhere correspondingly high and strongly correlated with single factor (0.6 or more) and degree of explained variance adequate (response to changes 73.1%, statistical literacy 54.9%, educational barriers 64.9% and competence of education system 65.1%). Individual scree plots with clear curve break behind first factor indicated single factor result. Obtained factors were stored as new variables using regression coefficient method and used for further analyses and/or analyses testing regression models. All factors in the research have Cronbach's alpha values slightly below or above 0.900, thus one can speak of excellent measurement reliability or accuracy or internal consistency.

Total scores of individual constructs show "statistical literacy" as the highest rated construct with average score of 3.45 (SD=0.78), which means respondents associate statistical literacy with the highest level of importance in conscious coping with complexity and dynamics of changes and competent response to them. This is followed by "response to change" with average score of 3.03 (SD=1.02), which is, according to the scale used, average

Table 5: Factor analysis results.

Factor / Construct	Questions - Variables	Cron-bah's α	Eigenvalues, Explained Var. (EV)	KMO, Bartlett's test	Factor Loadings	Average Mean, SD
Response to change (N=1239)	With statistical knowledge, I can understand social changes better (e.g. unemployment, natural growth...).	0.950	$\lambda_1 = 5.386$ $\lambda_2 = 0.426$ EV=73.151%	0.921 $p < 0.0001$	0.831	M=3.03 SD=1.02
	With statistical knowledge, I can understand changes in nature better (e.g. weather analysis...).				0.849	
	With statistical knowledge, I can understand technological change and progress better.				0.898	
	With statistical knowledge, I can understand economic changes better (e.g. inflation, oil prices, ...).				0.890	
	With statistical knowledge, I can understand financial changes better (e.g. stock markets, interest rates, taxes, etc.).				0.866	
	With statistical knowledge of statistics, I can understand scientific progress better.				0.838	
	With statistical knowledge, I can understand media publications better.				0.812	
Statistical literacy (N=1239)	The importance of statistical literacy is increasing in today's society.	0.894	$\lambda_1 = 4.289$ $\lambda_2 = 0.669$ EV=54.975 %	0.893 $p < 0.0001$	0.712	M=3.45 SD=0.78
	Statistical literacy is important for social development.				0.800	
	Statistical literacy is important for technological progress.				0.728	
	The importance of statistical education in schools is increasing.				0.635	
	Development of statistical literacy is a lifelong process of learning.				0.788	
	The concept of lifelong learning enables development of statistical literacy.				0.793	
	Development of statistical literacy must be continued also after completion of formal education.				0.720	

Table 5: Factor analysis results (continued).

Factor / Construct	Questions - Variables	Cron-bah's α	Eigenvalues, Explained Var. (EV)	KMO, Bartlett's test	Factor Loadings	Average Mean, SD
Educational barriers (N=1239)	I do not attend statistics course for fear of failure.	0.936	$\lambda_1 = 6.140$ $\lambda_2 = 0.816$ EV=64.981%	0.938 $p < 0.0001$	0.620	M=2.11 SD=0.90
	I do not attend statistics course due to lack of support and encouragement from the employer.				0.760	
	I do not attend statistics training because of lack of support and encouragement from my immediate family (family members).				0.903	
	I do not attend statistics course due to lack of support and encouragement from other relatives.				0.925	
	I do not attend statistics course due to lack of support and encouragement from my close friends.				0.923	
	I do not attend statistics course due to lack of support and encouragement from colleagues (or former colleagues) or classmates.				0.909	
	I do not attend statistics course due to lack of support and encouragement from acquaintances.				0.879	
	I do not attend statistics training due to lack of money.				0.625	
	I do not attend statistics course due to lack of training offer.				0.612	
Competence of education system (N=1239)	Slovenia offers poor supply of formal statistics education (ex.: schools, colleges, etc.).	0.901	$\lambda_1 = 3.590$ $\lambda_2 = 0.564$ EV=65.139 %	0.851 $p < 0.0001$	0.763	M=2.97 SD=0.85
	Slovenia offers poor supply of non-formal statistics education (ex.: societies, organizations, ...).				0.812	
	Statistics education system in Slovenia is poor.				0.890	
	Statistics education system in Slovenia is deficient.				0.862	
	Slovenia has uneven regional and local access to statistics education.				0.694	

or neutral rating. This indicates a semi moderate or moderate awareness among respondents that in today's social, economic and technological environment, it is not enough to face changes, but also to react proactively to them. The lowest scores are achieved by "competence of education system" with average score of 2.97 (SD=0.85) and "educational barriers", where average score of 2.11 (SD=0.90) essentially indicates absence of assessed barriers.

The correlation between factor and variable is expressed by factor loading. The greater the factor loading, the more factor is related to the variable. Recommended minimum value of factor loading is ± 0.3 , which is true of all values of variables in our research. Factor "response to changes" shows the highest value of factor loading is variable "with statistical knowledge I can understand technological change and progress better" (0.898), factor "statistical literacy" variable "statistical literacy is important for development of society" (0.800), factor "educational barriers" variable "I do not attend statistics education due to lack of support and encouragement from other relatives" (0.925) and "competence of education system" variable "statistics education system in Slovenia is poor". All value loadings are relatively high and indicate that selected claims, belonging to a particular factor, well define factor content.

4.3 Regression Analysis

Regression analysis of lifelong statistics learning determined interdependence between two or more groups of variables. In particular, multiple linear regression analysis to determine, the relationship between three independent (statistical literacy, educational barriers and competence of education system) and one dependent variable (response to change) was used. Preliminary analysis confirmed there were no multicollinearity among variables and that there was no deviation from criteria regarding normality of residual distribution and homoscedasticity.

Regression analysis was used for two research questions. First regression model, trying to answer first research question, examined which independent variable "educational barriers", "statistical literacy" and "competence of the education system" has the greatest influence on social actor's responsiveness to environmental changes, which represents dependent variable "response to change".

Table 6 shows that three independent variables, in standard model according to ANOVA statistics ($F=154.249$; $p<0.001$), significantly predict dependent variable »response to change«. One can conclude that due to standard regression analysis, model degree of predictability dependent variable was found to be $R=0.522$. The model degree of explanatory variance in dependent variable was $R^2=0.273$. Looking at these coefficients, one can say model predicts dependent variable very well.

Table 6: Model summary and ANOVA.

	<i>R</i>	<i>R</i> Square (<i>R</i> ²)	Adjusted <i>R</i> Square	Std. Error of the Estimate	
Model Summary	0.522	0.273	0.271	0.833	
ANOVA	Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	<i>Sig.</i>
Regression	321.302	3	107.101	154.249	0.000

Table 7: Multiple regression coefficients.

Model	Unstandardized Coefficients		Standardized Coefficients	<i>t</i>	<i>Sig.</i>	Collinearity Statistics	
	<i>B</i>	Std. Error	Beta (β)			Tolerance	<i>VIF</i>
Constant	0.001	0.024		0.022	0.982		
Educational barriers	0.069	0.025	0.070	2.825	0.005	0.969	1.032
Statistical literacy	0.447	0.026	0.435	17.411	0.000	0.945	1.058
Competence of educational system	0.185	0.026	0.182	7.223	0.000	0.932	1.073

Absolute value of Beta (β) in table 7 indicates order of importance of independent variables. Variable with the highest β value is relatively the most important independent variable. By examining contributions made by the independent variables in the model, final results, collected from “statistical literacy”, made the biggest contribution with value of ($\beta=0.435$; $p<0.001$). Values “competence of educational system” ($\beta=0.182$; $p<0.001$) and “educational barriers” ($\beta=0.070$; $p=0.005$) follow respectively.

Results of first regression analysis answers the first research question, which independent variable “educational barriers”, “statistical literacy” and “competence of the education system” has the greatest influence on social actor’s responsiveness to environmental changes, which presents dependent variable “response to change.” Based on first regression model results, statistical literacy has, among independent variables “statistical literacy”, “educational barriers” and “competence of the education system”, the largest and statistically significant influence on social actor’s responsiveness to environmental changes. This points to a focus where, in the future, it is necessary to find optimal solutions for planning, organizing, implementing and evaluating this type of statistical education, which, by emphasizing importance of statistical literacy, will enhance individual’s responsiveness to environmental changes.

Secondly, research was expanded to examine differences between age groups and/or generations. Second research question in second regression model checked which independent variable “educational barriers”, “statistical literacy” and “educational system competence” has the greatest influence on individual social actor’s responsiveness to environmental changes. The approach to increase

research to generations and perform regressions on individual generations stems from the need to adapt both formal and informal statistical education to educational needs of each generation. This also results in ability of individual generation to respond to change. Dependent variable “response to change” presents the latter in our regression model.

In identifying differences between generations, data in Table 8 show that independent variables “educational barriers” ($p<0.001$), “statistical literacy” ($p<0.001$) and “educational system competence” ($p<0.001$) statistically significantly affect dependent variable “response to change” in all three models. Generation 65 years and older has the strongest explanatory power of model, where independent variables explain 31.4% of variability of dependent variable. Generation aged 26-64 follows, where independent variables explain 27.7% of variability of dependent variable. Generation 18-25 has the weakest explanatory power of the model, where independent variables explain 21.7% of variability of dependent variable “response to change”.

When comparing predictive power of independent variables “educational barrier”, “statistical literacy” and “educational system competence” for dependent variable “response to change” by generations in Table 9, “statistical literacy” ($\beta_{18-25}=0.432$, $p_{18-25}=0.000$; $\beta_{26-64}=0.435$, $p_{26-64}=0.000$; $\beta_{65+}=0.436$, $p_{65+}=0.000$) has the strongest influence with independent variable in all three generations. Influence of independent variable “competence of education system” ($\beta_{18-25}=0.093$, $p_{18-25}=0.042$; $\beta_{26-64}=0.180$, $p_{26-64}=0.000$; $\beta_{65+}=0.245$, $p_{65+}=0.000$) follows for all three generations. Independent variable “educational barriers” has only a statistically significant effect on dependent vari-

Table 8: Model summary and ANOVA.

	<i>R</i>	<i>R</i> Square	Adjusted <i>R</i> Square	Std. Error of the Estimate	
Model Summary					
Generation 18 – 25 year olds	0.465	0.217	0.211	0.837	
Generation 26 – 64 year olds	0.526	0.277	0.272	0.810	
Generation 65 years old and more	0.560	0.314	0.308	0.842	
ANOVA	Sum of Squares	<i>df</i>	Mean Square	<i>F</i>	<i>Sig.</i>
Regression					
Generation 18 – 25 year olds	78.334	3	26.111	37.308	0.000
Generation 26 – 64 year olds	112.303	3	37.434	57.041	0.000
Generation 65 years old and more	121.358	3	40.453	57.010	0.000

able “response to change” ($\beta_{65+}=0.105$, $p_{65+}=0.017$) in generation 65 years old and older.

Results of the second regression model answer the second research question, which independent variable “educational barriers”, “statistical literacy” and “competence of education system” has the greatest influence on responsiveness of social actor from each generation to environmental changes. Based on second regression model results, which was extended with generational perspective of three generations from 18 to 25, 26 to 64, and 65 years old and over, statistical literacy has, among independent

variables “statistical literacy”, “educational barriers” and “competence of education system”, the largest and statistically significant influence on dependent variable “response to change” and/or on social actor’s responsiveness from all three generations to environmental changes.

One can deduce that first regression results, performed on the whole sample, and second regression set, performed on generations, point in the same direction: statistical literacy is crucial in responding to change. This is the starting point for (re)defining statistics education system in Slovenia for the needs of individual generations.

Table 9: Multiple regression coefficients.

Model		Unstandardized Coefficients		Standardized Coef- ficients	<i>t</i>	<i>Sig.</i>	Collinearity Statistics	
		B	Std. Error	Beta (β)			<i>Tolerance</i>	VIF
Generation 18 – 25 year olds	Constant	0.030	0.042		0.723	0.470		
	Educational barriers	0.008	0.046	0.007	0.167	0.868	0.980	1.020
	Statistical literacy	0.457	0.048	0.432	9.463	0.000	0.927	1.079
	Competence of edu- cational system	0.092	0.045	0.093	2.037	0.042	0.933	1.072
Generation 26 – 64 year olds	Constant	0.076	0.039		1.985	0.048		
	Educational barriers	0.069	0.040	0.071	1.723	0.086	0.957	1.045
	Statistical literacy	0.459	0.044	0.435	10.444	0.000	0.933	1.072
	Competence of edu- cational system	0.189	0.044	0.180	4.318	0.000	0.927	1.079
Generation 65 years and more	Constant	-0.104	0.044		-2.363	0.019		
	Educational barriers	0.101	0.042	0.105	2.390	0.017	0.954	1.049
	Statistical literacy	0.420	0.042	0.436	10.016	0.000	0.968	1.033
	Competence of edu- cational system	0.248	0.045	0.245	5.494	0.000	0.925	1.081

5 Discussion

Research results show that statistical literacy influences social actors' responsiveness to environmental changes in the whole sample and all subsamples or generations.

When comparing predictive power of independent variable "statistical literacy" for dependent variable "response to change" by generations, we find that the strongest influence is 26 to 64, followed by 65 and older and 18 to 25 generation. This is an indicator of the urgency of systemic change in improving statistical literacy to improve responsiveness to change in 18 to 25 and 65 and older generation. More attention on necessity for statistical literacy of individuals both in professional and personal life, will have to be channeled to educating and awareness-raising in all generations, improving offer and accessibility of formal and informal forms of statistical education for all generations.

We live in times where change is the only constant of an individual's life, so one's response to various changes is crucial. Even those bringing changes in lifestyles at different milestones in life, which can trigger psychosocial conflict in psychosocial personality development according to Erikson (1976). A favorable solution of psychosocial conflict enables transition to the next level of psychosocial development of an individual. Erikson (1976) thinks, adults can achieve integrity by "settling their life accounts" in satisfaction of being statistically literate, interacting with others in lifelong statistical learning and responding effectively to changes in educational, social, and technological environment. These changes can be life's victories or disappointments. Thus, an individual "matures" gradually deriving from experience of all previous seven stages (Erikson, 1976). Integrity is expressed as a confirmation of human affection for one's life and acceptance of a single life cycle. It is vital one takes responsibility for one's life.

Responding to change also means we can act differently. According to Giddens (1984: 14), ability to act differently means the ability to intervene in the world or refrain from such an intervention by which we can influence a particular process or state of affairs. Action depends on individual's ability to cause change in an existing state or set of events. If an actor loses this power, one ceases to exist, or, as Giddens claims, this can happen with one's death. Power, in this concept, is not resource needed in action, but applies to every action. In a comprehensive sense, power comes before subjectivity.

Social change response strengthens age integration, which can establish a new paradigm of activity of social actors from each generation. According to this new paradigm, education, work, and leisure will not, as in the past, only determine certain life stages, but each individual will also actively participate in entire life cycle. It is an entity of an inclusive society, where social, economic and organizational aspects of inclusion in lifelong learning - including

statistics - are equally balanced.

Due to constant social, technological and economic changes, social actor is, in interaction with social environment, constantly confronted with the need of acquiring new knowledge and different competences. Participants of lifelong learning and lifelong statistical learning should be prepared for ever-changing environmental requirements. The latter enables them to analyze environment reflexively, identify their own educational needs, make conscious choices to engage in new forms of lifelong learning and successfully adapt to environmental changes. Basic aim of statistical education today is aimed at acquiring such knowledge, skills, and competences that will enable them to use statistics in their daily and professional life - which means developing statistical literacy. Statistical literacy is primarily understanding and using statistical language and tools. Statistically better literate social actors participate fuller and more actively in working, personal and social environment and respond more effectively to environmental changes.

6 Conclusion

The research aims to contribute to understanding circumstances contributing to each generation's representative decision to participate in statistics education, moreover, in lifelong statistics learning. This will contribute to development of statistical literacy to cope more effectively and respond to changes in personal and/or professional life in age stages. Statistics education will not only involve the younger generation and perhaps partially the middle-aged generation. This is also an opportunity to educate the elderly, which follows trends of longevity of Slovenian ageing society, labour market needs to extend years of service and face changes in professional environment even in the old age.

Research results will, in the process of planning, implementation and evaluation of statistics education effects, benefit all generation participants, educational institutions and wider social environment. This ensures lifelong statistics learners educational and social equality, encouragement with decision making to integrate and continuous lifelong learning and use of statistics, thereby improving their statistical literacy, which will help them respond to environmental change and be more socially integrated in social environment. Research results will also be useful for educational institutions and other institutions involved in lifelong learning process of different generations. Through research findings, they will be able to strengthen their efforts to achieve a higher education competency in the field of lifelong statistics learning.

Research also answers questions, which are today, in new and changing social contexts, crucial for the role and importance of statistics in knowledge society: how to provide different generation users with appropriate, relevant

and accurate statistics data regarding diverse social, economic, technological and economic phenomena, and how to train users of different generations, in the light of developing statistical literacy, to use this data correctly. All this contributes to a better social actor's responsiveness to change, enhances individual's competitiveness, innovation and creativity and strengthens active citizenship.

Stereotypical view, of representatives of different generations, of statistics as a science or field which is useless in everyday life, that learning statistics is difficult and that statistics cannot be learned when older, often limits the research. Another limitation is underdeveloped, incompetent and non-responsive system of statistics lifelong learning in Slovenia. Research limitation is also that our research results cannot be relevantly compared as similar national or international research on different generations has not been done yet. When upgrading the research, it would be worth considering new sampling, which would be coincidental and would cover all Slovenian regions. Research could also be upgraded by taking into account involvement frequency of representatives of all generations in statistics education over a longer period of time (especially relevant for the elderly and middle-aged generation), and not only during three selected years.

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Vpliv statistične pismenosti na odzivanje na spremembe v okolju

Ozadnje in namen: Ob stalnih družbenih, tehnoloških in ekonomskih spremembah se socialni akter v interakciji z okoljem permanentno sooča s potrebo po usvajanju novega znanja in razvijanju različnih kompetenc - tudi na področju statistike. To mu ob ustrezno razviti statistični pismenosti omogoča reflektivno analizo okolja in odzivanje na spremembe v okolju. Namen prispevka je preučiti učinkovitost odzivanja boljše statistično pismenega socialnega akterja na spremembe v okolju s perspektive različnih generacij v Sloveniji.

Zasnova/Metodologija/Pristop: Empirične podatke smo zbrali z anketnim vprašalnikom ter jih obdelali in analizirali z izbranimi metodami deskriptivne in inferenčne statistike. V raziskavo smo vključili 1239 anketirancev vseh treh slovenskih generacij. Zastavili smo si dve raziskovalni vprašanji, kjer se eno nanaša na celotni vzorec in drugo na tri podvzorke glede na starostne skupine oziroma generacije.

Rezultati: Na celotnem vzorcu in tudi v vseh treh generacijah ugotavljamo, da statistična pismenost vpliva na odzivnost socialnega akterja na spremembe v okolju. Rezultati raziskave kažejo, da boljše statistično pismeni socialni akterji bolj polno in aktivno delujejo v delovnem, osebnem in družbenem življenju in se učinkoviteje odzivajo na spremembe v okolju.

Zaključek: Več pozornosti o nujnosti razvoja statistične pismenosti pri posamezniku, tako v poklicnem, kot tudi vsakdanjem življenju, bomo morali usmeriti v osveščanje in ozaveščanje vseh generacij o pomenu statističnega znanja za soočanje s spremembami v okolju, izboljšanje ponudbe in dostopnosti formalnih in neformalnih oblik statističnega izobraževanja za vse generacije. Rezultati raziskave bodo prispevali tudi k boljšemu načrtovanju in izvajanju statističnega izobraževanja na ravni izobraževalnih institucij in učiteljev vseh treh generacij.

Ključne besede: okoljske spremembe, statistika, statistična pismenost, socialni akter, izobraževanje, generacije

Workplace Ostracism as a Mediating Variable in the Relationship between Paradoxical Leader Behaviours and Organizational Inertia

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Background and Purpose: Many organizations suffer from an increased in the paradoxical behaviours of leaders, leading to followers to feel lonely and the workplace ostracism, which negatively effects the emergence of organizational inertia. The main purpose of this study is to examine direct and indirect effect of paradoxical leader behaviours on organizational inertia through the mediating role of the workplace ostracism.

Design/Methodology/Approach: Using the convenience sampling technique, a self-administered survey was conducted at the level of a sample ($n = 564$) of employees in the factories of the State Company for Textile and Leather Industry in Iraq. Structural equation modelling (SEM) was employed to test the proposed research model using the AMOS v.24 software.

Results: The findings revealed that paradoxical leader behaviours have a significant effect on workplace ostracism and organizational inertia. Further, workplace ostracism significant effect on organizational inertia. In addition, the study empirically supports the mediating effect of workplace ostracism on the relationship between paradoxical leader behaviours and organizational inertia.

Conclusion: When paradoxical behaviours arise in the behaviour of an organization's leaders, it will have an influence on the emergence of workplace ostracism amongst employees, hence the subsequent emergence of organizational inertia in general in the work environment. Based on these results, this study should be of help to leaders in avoiding paradoxical behaviours in terms of maintaining a certain equilibrium in dealing with employees to find a positive work environment that reduces staff ostracism, and thus organizational inertia.

Key words: *Paradoxical Leader Behaviours, Workplace Ostracism, Organizational Inertia*

1 Introduction

Some forms of behaviour of leaders in organizations may negatively affect their performance. One of them is paradoxical behaviour, as the paradoxical leader performs paradoxical behaviour even against himself or herself by changing his or her opinions periodically, but which reflects negatively in subordinates' behaviour towards the leader through effectively boycotting him/her (Zhang et al., 2015). However, paradoxical leader behaviour can enhance the role of the work of subordinates, and leaders can

set an example by showing employees how to accept and embrace paradoxes in complex environments (Pearce et al., 2019). One of the reasons why a leader is paradoxical is related to environmental changes, that is, the process of change and different cultures, which result in him facing a multitude of options that may themselves appear or be paradoxical, increasing tension and adding to the difficulties of leadership (Jia et al., 2018).

However, there may be obstacles to the leader making other decisions which in turn results in negative feelings and duplication of work among subordinates, thus decreasing their confidence in their leader (Luscher, 2019).

Even where paradoxes are not directly created because of a leader's behaviour but rather due to conflicting pressures, this can still lead to a state of ostracism of that leader by their subordinates, as they are generally not aware of all the variables related to leadership (Aggestam & Hyde-Price, 2019). Such ostracism by the subordinates in the work environment towards their leader can be particularly significant, and indeed dangerous, when it leads to them ignoring administrative decisions, which can lead the organization into a state of inertia, that is, without any actual growth (William & Nida, 2016). This in turn can result in increased antipathy towards the leader, in this case due to loss of communication (of some form) between the leader and the subordinates as a result of the initial ostracism resulting from the leader's paradoxical decisions (Li & Tian, 2016). Workplace ostracism occurs in all organizations, cultures and nations; it reduces the number of opportunities for social interaction and negatively affects the health and psychological behaviour of employees in terms of their attitudes towards work, leading to high levels of stress, emotional exhaustion, and increased levels of deviation in the workplace (Lane, 2017). Therefore, the organization, over time, will move into a state of stagnation and inactivity, such that its response to its business environment will become weak and it will also become unable to implement its strategic plans; ultimately, organizations can and will fail in the face of such organizational inertia. If this situation persists, it will certainly lead to the death of the organization from within (Chung & Kim, 2017).

Consequently, the purpose of this study is to investigate the mediating role of workplace ostracism on the relationship between the leader's contradictory behaviours and organizational Inertia in the General Company for Textile and Leather Industries in Iraq. Consequently, our study will try to address the gap represented by the lack of clarity of the relationship between the paradoxical leader behaviours, workplace ostracism and the organizational Inertia in the literature in order to reduce its negative effects by proposing an empirical model that includes testing four main hypotheses that explain the nature of the relationship between these variables. In addition, it will meet the needs of the industrial sector in Iraq for such studies due to the role of this sector affecting in Iraqi society. According to the discussion above, the following questions have guided the study design:

- How does paradoxical leader behaviour influence workplace ostracism?
- How does workplace ostracism influence organizational inertia?
- How does paradoxical leader behaviour influence organizational inertia?
- How does workplace ostracism mediate the relationship between paradoxical leader behaviour and organizational inertia?

2 Theoretical background

2.1 Paradoxical Leader Behaviour and Workplace Ostracism

Vocabulary Dictionary 2019 defines a paradox as anything that has two apparently contradictory meanings, where there is no logic by which these two meanings can coexist. The roots of this word (paradoxical) go back to Greek and translate as "dissenting opinion" and which represent the collision of two different views in a single statement or work. In this paper we take the view that paradox and dialectics provide for understanding leaders paradoxes different yet equally and simultaneously valid. Paradoxes are defined as dynamic tensions between opposite elements that together form a unity and logically presuppose each other for their very existence and meanings (Hargrave & Van de Ven, 2016). In this case, Alfes & Langner (2017) pointed out that the "paradoxical leadership style", which can be described as competing but interrelated leadership behaviour, is used to simultaneously meet the demands of competing subordinates. According to Zhang et al. (2015) and Wilkinson (2019), organizations are increasingly facing complex, volatile and uncertain environments, which are in themselves tense because of the contradiction between individual and organizational needs. Such circumstances require leaders to engage in managing dialectical tension and conflicting demands. Bolden et al. (2016) pointed out that paradox is absurd, and, although it has powerful foundations, self-paradoxical or absurdity can be used to describe a person or object that contradicts preconceived notions of what is moderate or possible. Cronin & Genovese (2015), Yang et al. (2019), and Osland & Wang (2014) all noted that differences between cultures, challenges within industry, long- and short-term periods of time, and different measures of success affect leaders' paradoxical behaviour.

Workplace ostracism occurs when an individual or group ignores actions that involve other organizational members when this would otherwise have been socially appropriate (Lane, 2017). There is value in having a definition that also captures and clarifies the core characteristic shared by a set of behaviours; that is, what do exclusion, shunning, ignoring, and rejecting share in common that justifies placing them under a general construct labelled "ostracism"? Identifying the core feature will help us to understand their shared antecedents and impact as well as provide the conceptual boundaries around the construct of ostracism, providing guidance about which behaviours it can include (beyond those listed) and distinguishing it from other related phenomena (Robinson et al., 2013). Some researchers identified six benefits of workplace ostracism: self-protection, restoring justice, protecting the group, promoting constructive behaviour, and group cohesion and identity (Eickholt & Goodboy, 2017; Chang et al.,

2019). Lane's (2017) definition above combines specific forms of behaviour with different terms such as ostracism and exclusion, ignoring and avoiding the participation of an essential element and failure to engage socially with the other in the work. William & Nida (2016) found that ostracism is negatively associated with psychological and physical well-being, and that workplace ostracism leads to increased emotional exhaustion and feelings of anxiety.

Paradoxical leader behaviour is one of the more significant precursors to the emergence of workplace ostracism by subordinates, as the leader's behaviour is paradoxical even to himself through the inconsistencies in his actions with time, which ultimately reflects negatively on performance (Zhang et al., 2015). There are obstacles that appear before the leader in terms of being able to make other decisions which are paradoxical, and which generates a sense of frustration and duplication amongst subordinates, reducing their confidence in their leader regardless of the factors that caused the behaviour that led to that individual to undertake paradoxical decision making in the first place, and is the reason for the emergence of a state of ostracism by subordinates towards their leader (Bolden et al., 2016). This reflects the perceived organizational support role that strengthens the relationship between the leader and employee and maximizes his level of satisfaction and commitment (Albalawi et al., 2019).

Based on the above discussion, the following hypothesis can be proposed:

H1: Paradoxical leader behaviour has a positive effect on workplace ostracism.

2.2 Workplace Ostracism and Organizational Inertia

Workplace ostracism can be meaningful when individuals are aware of their unwillingness to engage with another person socially and do so with intentions that could harm the organization's goals or further their exclusion (Chung, 2018). Fiset et al. (2017) argue that workplace ostracism negatively affects organizations' goals and leads to reduced productivity, high turnover and high costs related to re-employment and training. It thus embodies the common element of a wide range of behaviour between members and organizational groups including collective exclusion, rejection, avoidance, disregard, and the treatment of another element as invisible at work (Rudert et al., 2019).

The word 'inertia' is of Latin origin, "*Iners*", which means "inactivity and laziness". Newton defined inertia as "every object remains in a state of rest or uniform movement unless acted upon by an unbalanced, external force." Therefore, organizational inertia is a phenomenon of stagnant organizations and an essential element of organizational behaviour and save the capacity when inertia is gradually integrated with organizational practices (Huang et al., 2013). According to Clegg & Bailey (2007), organ-

izational inertia hinders organizational adaptation, reduces the effectiveness of administrative activities and at the same time acts as a primary source of resistance to change. Carroll & Hannan (2004) added that organizational inertia makes organizations' responses to change of all kinds slow or almost impossible, and organizational flexibility is lost because of it. Puan (2008) added that organizational inertia leads to tensions and paradoxes between exploration and exploitation. Chauvel (2011) added that organizational inertia places restrictions on experiential education and structural change within an organization.

Workplace ostracism also leads to high levels of anxiety, emotional attrition, increased pressure and deviation in the workplace, due to which the organization will move into a state of deterioration and inertia over time and which will be reflected in lower overall performance and resistance to the change sought by leaders from the outset, weakening the organization and leaving it unable to implement its strategies and failing in its general activities, ultimately suffering from the inertia to its major plans and structures (Chung & Kim, 2017). As such, it is a fundamental reason for the weakening of the relationship between a leader and their subordinates, the loss of confidence, the hostility, and the weakness at work which results in many of the more serious workplace problems (Aggestam et al., 2017).

Based on the above discussion, the following hypothesis can be proposed:

H2: Workplace ostracism has a positive effect on emergence of organizational inertia.

2.3 Paradoxical Leader Behaviour and Organizational Inertia

Laureir-Martinez (2017) argues that paradoxical leadership behaviour refers to the behaviours of leaders competing with each other so as to meet competing workplace requirements simultaneously and over time. Mammassis & Schmid (2018) added that paradoxical leader behaviour leads to a kind of duplication among developers. Zhu et al. (2017) added that paradoxical leader behaviour seems to be that of a competing leader to allow them to meet the requirements of the workplace simultaneously and over time. Luscher (2019) pointed out a number of characteristics of paradoxical leadership: showing confidence in subordinates, being open, fighting for their unity, planning their time, promising to express their opinions, foresight, ability to analyse opinions, possessing a certain dynamic and patience, and having confidence in themselves.

Jia et al. (2018) & Pearce et al. (2019) emphasized a set of characteristics that define paradoxical leader behaviour (total thinking, integrative complexity, organic versus mechanical structure, creative behaviour, adaptive behaviour, proactive behaviour). Zhang et al. (2015) identified dimensions of the paradoxical leader behaviours in a realistic way at the level of business organizations : equal treat-

ment of subordinates while allowing individualization, combining self-centeredness with others centeredness, maintaining control of decisions while allowing for independence, strengthening work requirements while allowing for flexibility, and maintaining distance and closeness. According to Grams & Farrell (2008), organizational inertia is a spontaneous and deep change whose presence is difficult to detect. Steady long-term leadership is required in order to withstand setbacks, survive and overcome organizational inertia. Barnett & Pontikes (2008) noted that organizations suffer from organizational inertia when the speed at which they reorganize is less than the rate of change in their environmental conditions, and organizational inertia and resistance to change increases with age. Naslund & Perner (2012) added that organizational inertia is the inability to change stories and tone because the organizational approach requires organizational change and transformation. Godkin & Allcom (2008) further added that organizational inertia takes two forms: the inertia of foresight and the inertia of work. Hung (2015) argued that organizational inertia occurs when organizations seek to build specific knowledge which is contrary to the theory of organizational adaptation. Organizational inertia may occur as a result of the totality of tensions and paradoxes between a leader and their subordinates, as well as a result of the discrepancies between exploratory and exploitative activities (Puhan, 2008).

Barnett & Pontikes (2008) noted that high organizational inertia negatively affects organizations' performance and occurs when a leader's actions are paradoxical and the process of internal change is much slower than the rate of change of the organization's environmental conditions, and leads to a sense of loneliness and frustration within the workplace because of being ignored or due to problems with a leader or co-workers. Inertia, poor administrative activities, and difficulty with work result in the internal pressures and negative climates that may arise due to weak relations between co-workers and poor relationships with leaders (Sakuraki, 2016). This can negatively affect the employees' awareness of the importance of the relationship with the leader and thus their reduced capabilities, level of satisfaction, and organizational commitment to them (Gorenak et al., 2019).

Based on the above discussion, the following hypothesis can be proposed:

H3: Paradoxical leader behaviour has a positive effect on emergence of organizational inertia.

2.4 Paradoxical Leader Behaviour, Workplace Ostracism, Organizational Inertia

Aggestam & Hyde-Price (2019) pointed out that paradoxical leader behaviour is a set of informal practices used by leadership in managing its affairs rather than relying on the traditional institutional structures and procedures within its programme. Uljens (2015) added that leadership's paradoxical behaviour represents a deviation from ethics; for example, the deviations in educational leadership in pursuing extraneous Western traditions of organizational citizenship and social transformation. According to Aggestam et al. (2017), this leads to a weakened relationship between the leader and his subordinates, and a consequent loss of confidence and inability to behave autonomously and, ultimately, workplace ostracism.

Shao et al. (2019) argued that when employees face paradoxical and diverse demands and challenges within complex dynamic work environments, they suffer from low motivation and organizational inertia. Zheng et al. (2016) and Zhao et al. (2016) both argue that workplace ostracism leads to the depletion of personal resources and psychological capital. They added that the nature of workplace ostracism is to withhold required information, avoid conversations, and turn a blind eye when seeing the one who has been ostracized. Fatima (2017) pointed out that workplace ostracism causes non-adaptive responses, where people who are ostracized from the workplace are more likely to be aggressive towards those who have excluded them. Qian et al. (2017) pointed out that workplace ostracism takes many forms, such as silent communication, or avoiding contact, exile, and deportation. Criscuolo & Narula (2007) emphasized that organizational inertia increases when there is a high level of operational complexity, making reorganization more difficult.

Tsai (2007) pointed out five determinants of organizational inertia: distorted perception, reduced motivation, failure of the creative response, political inertia, and cut-offs (leadership inaction). Sakuraki (2016) described the extent to which organizational inertia can affect the weakness in the management of the production line and the difficulties with implementing strategic change. Oyadomari et al. (2018) added that organizational inertia is positively related to organizational size and thus administrative control can be linked with organizational inertia. The more aware of subject to the exposure of such paradoxical behaviours by its leader whenever follower felt abandoned and, in many cases, may ignore co-workers, which is one aspect of workplace ostracism that in turn results in silence and lack of participation and inertia in terms of thinking and initiative (Osland & Wang, 2014).

A leader's paradoxical actions can result in workplace ostracism which includes certain forms of negative behaviour, for example, ostracism and exclusion, i.e., reduced

participation, failure to cooperate and a lack of social engagement with others at work, which affects the psychological state of employees and results in a certain inertia in terms of their vision and providing solutions and suggestions to problems (Lane 2017). Also, strong leaders are needed to work, and the leader must keep his subordinates aware of all the variables that have resulted in his behavioural paradox to avoid being ostracized and the previously noted consequences (Zhang et al., 2015).

Based on the above discussion, the following hypothesis can be proposed:

H4: Workplace ostracism is mediator of the relationship between paradoxical leader behaviour and organizational inertia.

Based on the above-mentioned hypotheses, this study proposes the conceptual model shown in Figure 1, which shows the relationship between the variables.

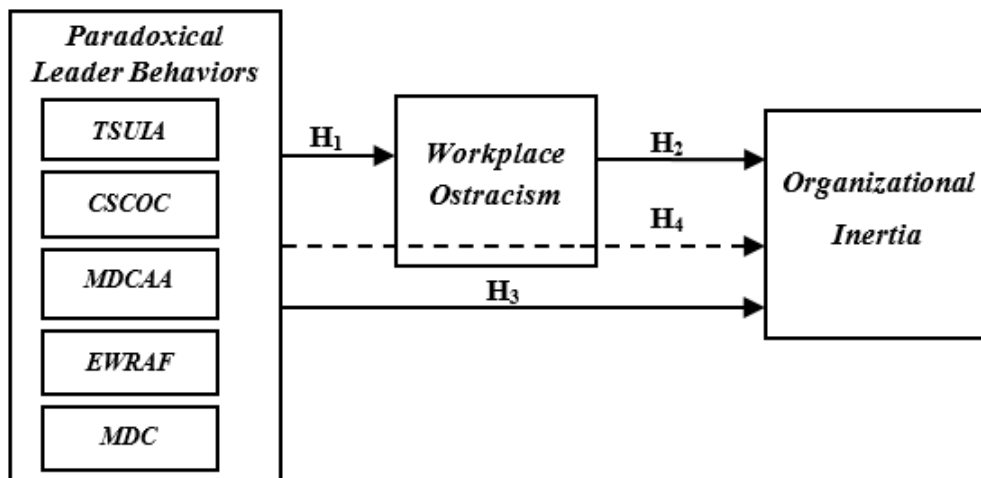


Figure 1: Conceptual Model

TSUA = Treating subordinates uniformly while allowing individualization; CSCOC = Combine self-centeredness with other centeredness; MDCAA = Maintaining decision control while allowing independency; EWRAF = Enhance work requirements while allowing flexibility; MDC = Maintain distance and closeness.

3 Methodology

3.1 Measures

Paradoxical leader behaviour: this is measured based on a scale (Zhang et al., 2015) which includes five dimensions: equal treatment of subordinates while allowing individualization (5 items), combining self-centeredness with others' centeredness (5 items), maintaining control of decisions while allowing for independence (4 items), strengthening work requirements while allowing for flexibility (4 items), and maintaining distance and closeness (4 items).

Workplace ostracism: this is measured based on a scale proposed by Ferris (2008) and Steinbauer et al. (2018). It is a one-dimensional measure that includes 15 items. This measure has seen various amendments and additions to adapt some of its formulae to the nature of the work of employees and the environments in which they deal with their data.

Organizational inertia: this measured based on a scale (Huang et al., 2012) which includes three dimensions: insight inertia (4 items), action inertia (5 items), and psychological inertia (4 items).

For all measures, variables were measured at the individual level, and a five-point Likert scale was used for an incomplete agreed phrase, which gave weight (1) to the complete agreed phrase, which gave weight (5). Questionnaire items are shown in the Appendix.

3.2 Sampling and data collection

The State Company for Textile and Leather Industry, which is based in the capital Baghdad, was chosen to study application, due to the importance of the company in the Iraqi economy and the possibility of conducting the study in its various factories. The data was collected in July 2019 through the selection of a random sample consisting of a group of employees working in the company's various fac-

tories in the production, marketing, sales, planning, human resources, engineering, informatics and computer departments. The questionnaire was distributed in two ways. First, 244 questionnaires were distributed via e-mail to potential respondents in departments of Kut Textile & Knitting Factory, Garments Factory – Nineveh, Dhi Qar Textiles Factory and Diwaniya Textile Factory, which could not be visited in person because of their distant geographic location. Second 320 questionnaires were distributed in departments of Leather Industries Factory, Cotton Industries Factory, Wool Industries Factory, Handmade Carpet Factory and Hilla Textile Factory, which were reached by the researchers personally. Employees were given 30 days to complete the questionnaire. Table 1 shows distribution of the sample across the company's factories.

The questionnaires were clarified, scientific content was explained, and response to all inquiries about how to answer items through personal communication with members of sample and via internet communication.

The sample was 74% male and 26% female. 34% of the respondents were less than 35 years old, 49% were between 35-45 years old, and the remaining 17% of the respondents were over 45 years old. As for the nature of the activities they performed, 58% of the administrators worked in different sections of each factory whilst the remaining 42% were technicians with various titles and job qualifications. While the educational level of the respondents was 27% held diplomas, 65% of them were bachelors, and 8% of them had higher degrees.

Table 1: Distribution of questionnaires across the company's factories.

Factory name	Number of distributed question.	Number of retrieved question.	Number of valid question.	Number of invalid question.
Leather Industries Factory	65	63	61	2
Cotton Industries Factory	55	53	53	0
Kut Textile & Knitting Factory	40	39	37	2
Garments Factory - Nineveh	70	68	64	4
Wool Industries Factory	75	72	71	1
Handmade Carpet Factory	55	54	52	2
Dhi Qar Textiles Factory	65	65	65	0
Hilla Textile Factory	90	86	83	3
Diwaniya Textile Factory	85	81	78	3
Total	600	581	564	17

4 Data analysis and results

4.1 Confirmatory factor analysis

The researchers used confirmatory factor analysis (CFA) to confirm the structural validity of the research criteria as this test ensures the consistency of the theoretical structure prepared by the scales according to the responses given by the sample.

When conducting CFA analysis of paradoxical leader behaviour, it was clear that the standard parameter estimates were all acceptable and significant, and the structural model was highly matched because the model matching indicators were themselves acceptable ($\chi^2 = 416.663$, GFI = .909, CFI = .916, IFI = .917, TLI = .901, RMSEA = .055) as shown in Figure 2.

The CFA analysis of workplace ostracism shows that the standard parameter estimates were all acceptable and

were all significant, and that the structural model was highly matched since the model matching indicators were themselves acceptable ($\chi^2 = 271.105$, GFI = .905, CFI = .929, IFI = .930, TLI = .910, RMSEA = .079), as shown in Figure 3.

Similarly, the CFA analysis of the organizational inertia variable shows that the standard parameter estimates were all acceptable and were all significant. The structural model indicated a high degree of conformity since the model matching indicators were themselves acceptable ($\chi^2 = 140.755$, GFI = .947, CFI = .934, IFI = .935, TLI = .910, RMSEA = .063), as shown in Figure 4.

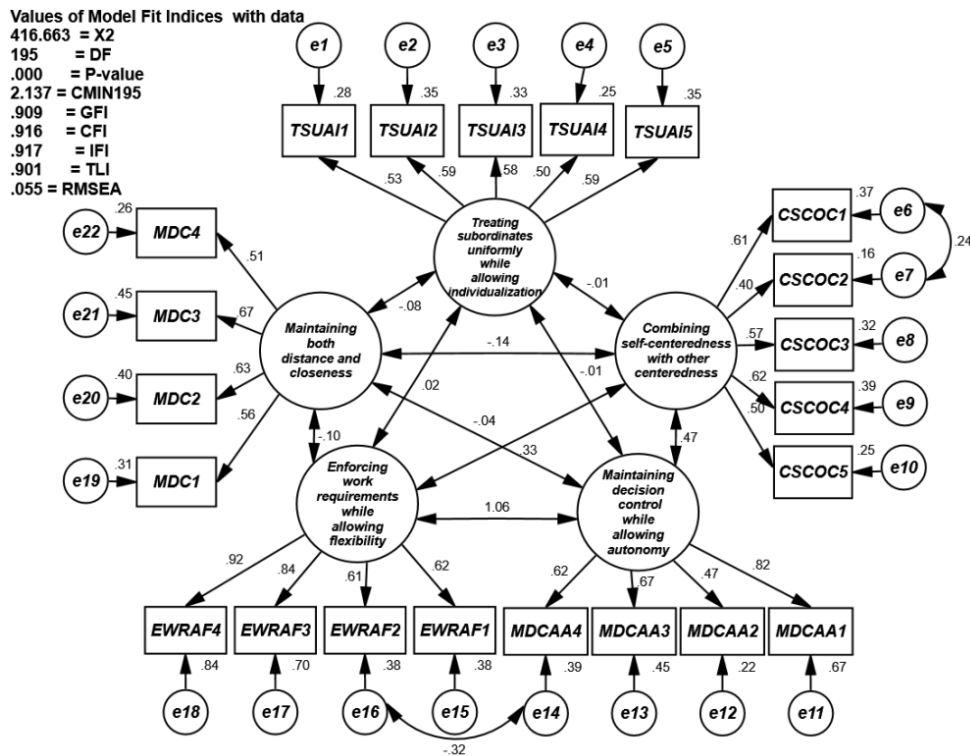


Figure 2: Confirmatory Factor Analysis of paradoxical leader behaviours

TSUA = Treating subordinates uniformly while allowing individualization; CSCOC = Combine self-centeredness with other centeredness; MDCAA = Maintaining decision control while allowing independency; EWRAF = Enhance work requirements while allowing flexibility; MDC = Maintain distance and closeness.

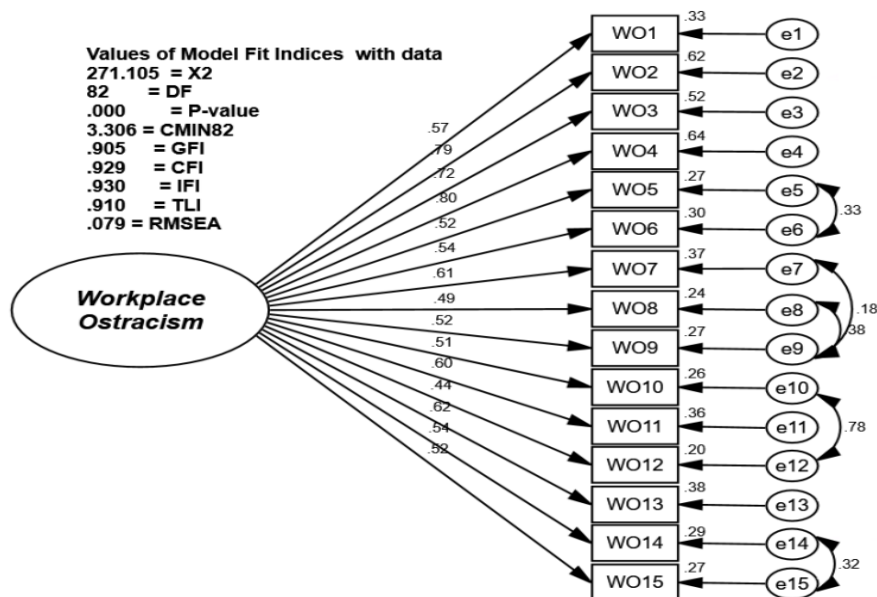


Figure 3: Confirmatory Factor Analysis of the workplace ostracism.

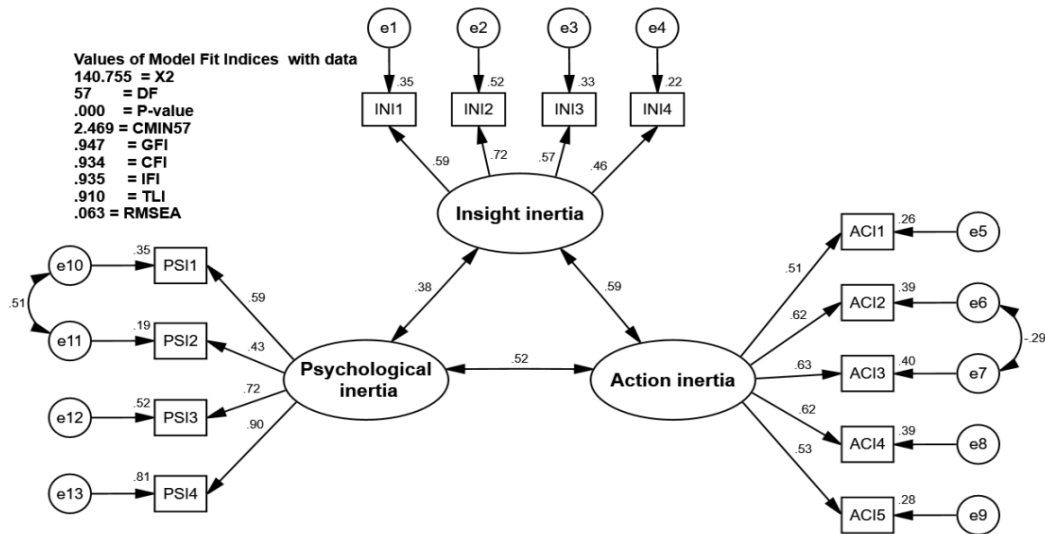


Figure 4: Confirmatory Factor Analysis of the organizational inertia variable.

4.2 Descriptive statistics and correlation

Table (2) shows the Cronbach's Alpha and descriptive statistics (M = mean, SD = standard deviation) and the correlation between variables at the level of the State Company for Textile and Leather Industry.

4.3 Hypotheses Test

Research hypotheses have been tested based on Structural Equation Modelling (SEM) for Direct Impact Hypothesis and Path Analysis to test the Indirect Impact Hypotheses, as follows:

Figure (5) shows the results of the structural equation modelling outputs to test the tracks of the effect of paradoxical leadership behaviour on workplace ostracism. The standard parameter estimates show that effect of paradoxical leader behaviour on workplace ostracism as follows: MDC = .32, TSUAI = .30, MDCAA = .22, CSCOC = .20, EWRAF = .10. It is also clear that the value of the coefficient of determination ($R^2 = .73$) indicates the emergence of cases of exclusion and indifference to employees, and the poor communication with them, is due to leaders following modes of paradoxical behaviour.

Figure (6) shows the results of the structural equation modelling outputs to test the effect of workplace ostracism on organizational inertia. The standard parameter estimate

Table 2: Cronbach's Alpha, descriptive statistics and correlation results.

Var.	α	M	SD	1	2	3	4	5	6	7
1.TSUAI	.77	2.97	1.09	1						
2.CSCOC	.81	2.98	1.11	.48**	1					
3.MDCAA	.83	2.98	1.07	.50**	.59**	1				
4.EWRAF	.73	3.14	.99	.25**	.31**	.40**	1			
5.MDC	.79	2.81	1.07	.49**	.40**	.48**	.33**	1		
6.WO	.86	2.93	1.05	.64**	.59**	.62**	.43**	.72**	1	
7.OrgInc	.90	3.11	1.12	.49**	.52**	.52**	.36**	.52**	.60**	1

**Correlation is significant at the 0.01 level, n = 564.

TSUAI = Treating subordinates uniformly while allowing individualization; CSCOC = Combine self-centeredness with other centeredness; MDCAA = Maintaining decision control while allowing independency; EWRAF = Enhance work requirements while allowing flexibility; MDC = Maintain distance and closeness, WO = Workplace Ostracism.

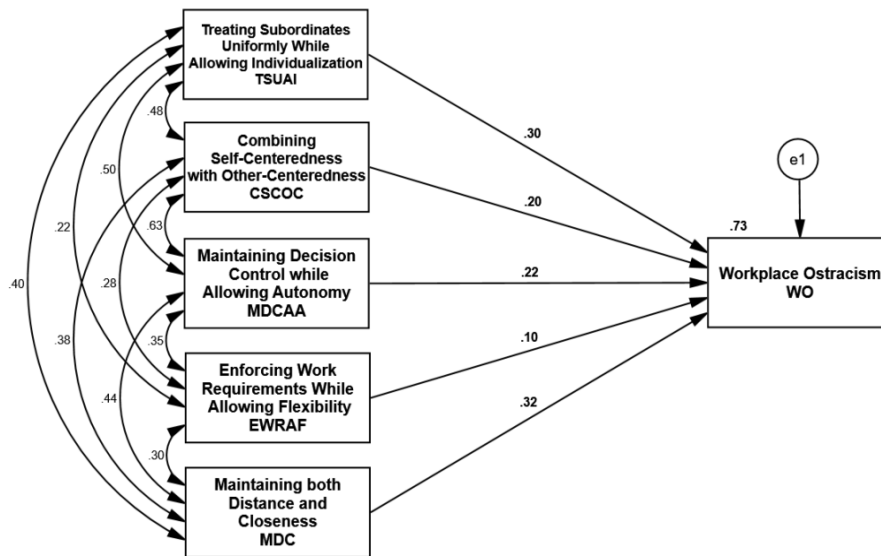


Figure 5: The effect of paradoxical leadership behaviours on the workplace ostracism.

was .49. It is also clear that the value of the coefficient of determination ($R^2 = .24$) indicates that workers' responses to work and their low contribution to problem solving are due to workplace ostracism and neglect.

Figure (7) shows results of structural equation modelling outputs to test of effects of paradoxical leader behaviours on organizational inertia. It is evident from the standard parameter estimates that the effect of paradoxical leader behaviour on organizational inertia was as follows: CSCOC = .18, TSUAI = .17, MDC = .16, MDCAA = .152, EWRAF = .150. It is also clear that the value of the coefficient of determination ($R^2 = .34$) indicates the emergence of high cases of psychological inertia and work-related inertia and the thinking that appears amongst the staff due to the leaders following paradoxical behaviour.

As for the indirect effects by which we determine

whether the type of model is a partial or complete mediator, this is shown in Figure (8), which includes the structural model of the indirect effects of paradoxical leadership behaviour on organizational inertia through the mediating role of workplace ostracism. The five paradoxical leadership behaviours have a direct impact on organizational inertia (TSUAI = .11, CSCOC = .19, MDCAA = .19, EWRAF = .12, MDC = .16), as shown in Table (3), which also shows that there is an indirect effect of paradoxical leader behaviour on organizational inertia through the mediating effects of workplace ostracism, which were TSUAI = .047, CSCOC = .034, MDCAA = .026, EWRAF = .027, MDC = .079, as shown in Table (4). The value of the coefficient of determination ($R^2 = .45$) indicates that workplace ostracism only mediates the relationship between paradoxical leader behaviour and organizational inertia.

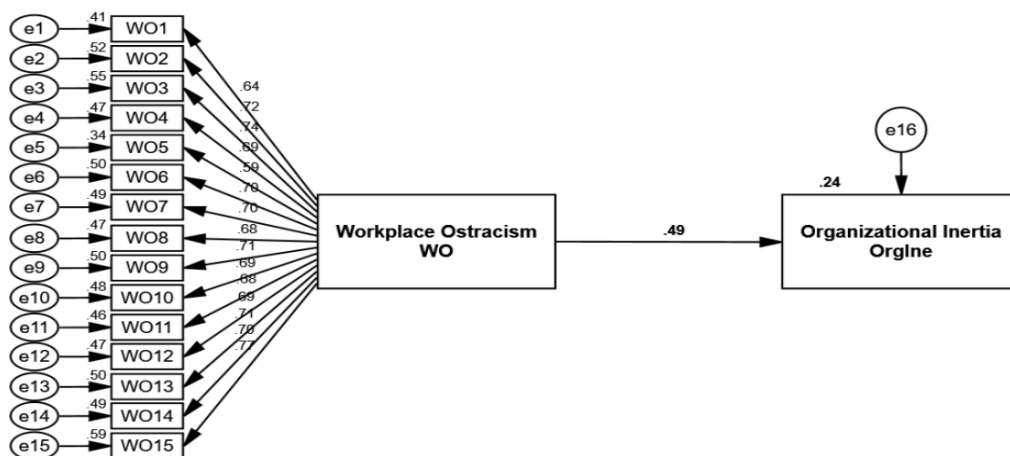


Figure 6: Effect of the workplace ostracism on organizational inertia.

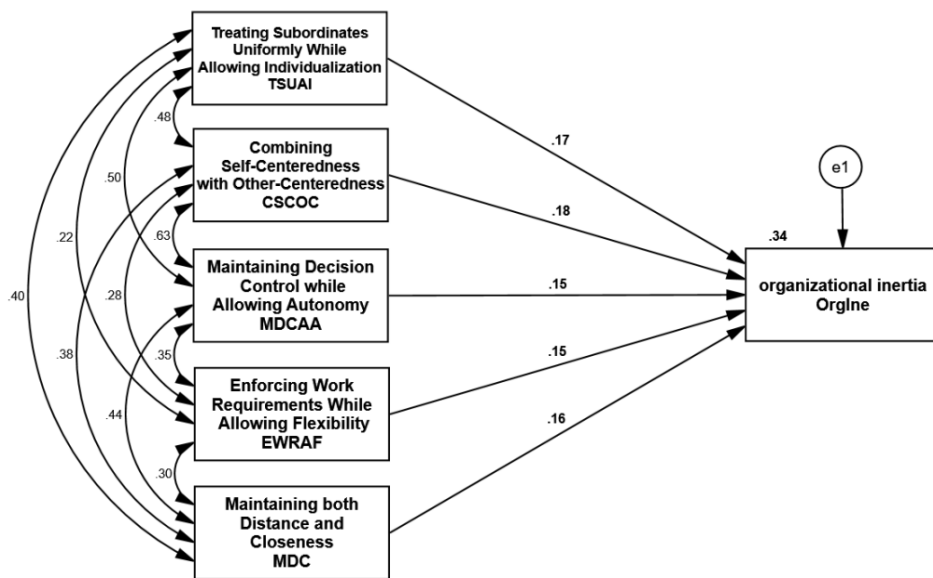


Figure 7: The effect of paradoxical leader behaviours on organizational inertia.

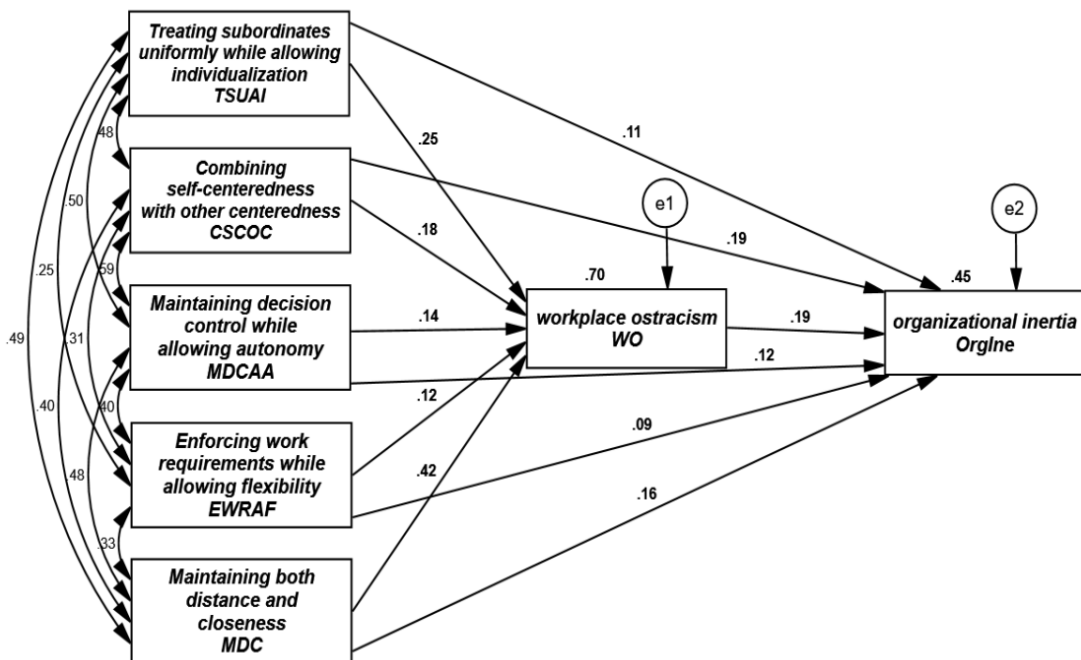


Figure 8: The effect of paradoxical leadership behaviors on organizational inertia through the mediating role of workplace ostracism.

Table 3: Direct effect parameters between variables.

Paths			Standard Estimate	Unstandard Estimate	S.E.	C.R.	P	R ²
TSUIA	--->	WO	.249	.235	.034	6.965	***	.70
CSCOC	--->	WO	.180	.168	.034	4.886	***	
MDCAA	--->	WO	.135	.130	.038	3.437	***	
EWRAF	--->	WO	.121	.126	.033	3.811	***	
MDC	--->	WO	.418	.402	.034	11.986	***	
WO	--->	OrgIne	.189	.205	.076	2.696	.007	.45
TSUIA	--->	OrgIne	.112	.115	.052	2.188	.029	
CSCOC	--->	OrgIne	.192	.193	.052	3.721	***	
MDCAA	--->	OrgIne	.122	.128	.056	2.265	.024	
EWRAF	--->	OrgIne	.094	.107	.049	2.163	.031	
MDC	--->	OrgIne	.159	.165	.058	2.861	.004	

*** The probability of getting a large critical ratio is less than 0.001.

TSUIA = Treating subordinates uniformly while allowing individualization; CSCOC = Combine self-centeredness with other centeredness; MDCAA = Maintaining decision control while allowing independency; EWRAF = Enhance work requirements while allowing flexibility; MDC = Maintain distance and closeness.

Table 4: Indirect effect parameters between variables.

	MDC	EWRAF	MDCAA	CSCOC	TSUIA
WO	.000	.000	.000	.000	.000
OrgIne	.079	.023	.026	.034	.047

5 Discussion

The results of our study show that paradoxical leader behaviour plays a significant role in the emergence of cases of organizational inertia in all its forms, namely psychological inertia, insight inertia and work inertia, with an intermediary role played by workplace ostracism, which leads us to the basic fact that paradoxical behaviour in leaders may be a realistic proposition due to the unsupportive environmental factors and negative climates that may come to exist for various reasons that may be outside the control of management. This is consistent with the opinion of Laureir-Martinez (2017), who stressed that paradoxical leadership behaviour may lead to the exploitation of the performance of individuals and affect the way they manage their assigned tasks, leading to errors and poor compliance with work requirements and mechanisms. It is also clear that paradoxical leader behaviour may make subordinates reluctant to provide ideas and suggestions or contribute to problem solving. This has also been confirmed by Behne (2018), namely that the paradoxical style of leadership is characterized by an exaggerated selfishness. The paradoxical leader knows nothing about humility and empathy, and

always criticizes people for their actions and treats them as if they have been working for long periods.

Also, workers sense of workplace ostracism has a significant impact on the emergence of organizational inertia amongst them, and this confirms the impact of disregard and exclusionary behaviour and poor social interaction between subordinates and leaders with regard to their performance and reactions to work and the nature of their interactions with colleagues, resulting in dissatisfaction with their jobs in general. This is consistent with the assertion Steinbauer et al (2018) that workplace ostracism is positively associated with employee depression and the deviation of personality and social undermining and at the same time lead to unfavourable positions related to the job including low Satisfaction and commitment, untouchable employees feel low personal justice towards them, record high turnover and suffer from low levels of organizational citizenship.

The results also showed the importance of the role of workplace ostracism as a partial mediator between paradoxical leadership behaviour and organizational inertia. This is evidenced by leaders following certain paradoxical behaviour in their dealings with subordinates, such as regarding some as a group and some as individuals, and

a lack of clarity of focus in dealing with subordinates in terms of leadership and empowerment, poor visibility of leaders on a consistent view of granting independence and addressing problems by subordinates, and a lack of flexibility in dealing with and not adopting them both with subordinates would create a sense of ostracism within the subordinates. Exclusion, lack of interest and lack of satisfaction with their performance and present them efforts and this in turn establishes a state of frustration and suffering at work, killing the spirit of creativity and ultimately resulting in organizational inertia.

5.1 Conclusions

Paradoxical leader behaviours was found an important variable that must be studied at the level of business organizations, especially with regard to the treatment of subordinates in terms of allowing for individualization, combining self-centeredness with others' centeredness, maintaining control of decision making while allowing independence, strengthening work requirements while allowing flexibility, and maintaining distance and closeness, Which causes the appearance of negative effects on subordinates, and their sense of workplace ostracism and their neglect of others and leaders, weak social relations and negative psychological effects on their presence in the workplace.

Workplace ostracism is one of the most negative variables on the performance of employees, especially if employees become disappointed and dissatisfied as well as showing an inability to achieve professional standards and having weak social relations with leaders and co-workers. This in turn leads to the work-related and psychological inertias that result in reduced participation and lack of commitment to organizational goals, avoidance of responsibility, psychological anxiety and fear of work.

It is clear from the results of the hypothesis test that there is a direct impact of a leadership's paradoxical behaviour on the employees' sense of workplace ostracism. It is noticeable that the leaders that give priority to a specific goal that may be close to their personal interests whilst sacrificing others in which the interest of the company may be realized, will in turn lead to a state of tension in the prevailing climate. This will contribute to the emergence of certain negative factors, and the problems realized from differences in culture and the incompatibility of attitudes and reactions to work-related issues. In response to such behaviour, staff delay the completion of tasks or prolong the completion of their work due to indifference and antipathy. It is also evident that the feeling of workplace ostracism has a significant impact on organizational inertia as well as feelings of fatigue, psychological suffering and emotional exhaustion.

The hypothesis test shows the clear role of leaders' paradoxical behaviour in the emergence of organizational inertia, which makes the leadership role is unclear and par-

adoxical in front of the subordinates, which in turn increases their sense Unacceptability and poor attention to them, therefore, the Paradoxical behaviours for leaders, it will be an incentive and motivation for the workplace ostracism, hence the emergence of organizational inertia in general in the work environment.

5.2 Theoretical and Practical implications

Regarding the theoretical contribution, this study provides a new research model in the field of paradoxical leadership behaviour, workplace ostracism and organizational inertia. However, only relatively limited attention has been paid to the combinatory and underlying process through which they increase or decrease workplace ostracism and organizational inertia. To fill this gap, this study has developed a model to examine the mediating role of workplace ostracism on the relationship between paradoxical leader behaviour and organizational inertia. The theoretical contributions to this study stem from the unveiling of a significant impact of the leader's paradoxical behaviour on the emergence of workplace ostracism and organizational inertia, as the study demonstrated that employees' sense of workplace ostracism has a significant impact on the emergence of organizational inertia in their overall daily behaviour. In particular, the study demonstrated that one of the main reasons that leads the employee into organizational inertia is workplace ostracism, the effects of which are due to the many paradoxical behaviours that the leader adopts in his various interactions.

Practically speaking, this study should be of help to the leaders of the State Company for the Textile and Leather Industry in avoiding paradoxical behaviour and in terms of maintaining a certain equilibrium in dealing with subordinates by promoting ethical behaviour and practices as based on honesty, integrity, honesty and sincerity at work, and that embody the spirit of commitment, sportsmanship, assistance and cooperation and continuous communication between leaders and subordinates. Leaders away from the paradox in the words, deeds, behaviour and overall behaviour with the subordinates and seek to achieve their interests and concern for their affairs in order to strengthen the relationship with them and delegate some powers to them and allow participation and provide Proposals and solutions to existing and future problems. Moreover, this research confirms on importance of self-control for subordinates, as this is the best guide for individual behaviour within the internal environment and harmony with colleagues and cooperation and unify efforts in the accomplishment of tasks, which in turn lends to find A positive work environment reduces staff ostracism in workplace.

5.3 Limitations and future research

This paper has several limitations. **First**, this study focuses on the factories of the State Company for Textile and Leather Industry, which may not be generalizable to other sectors; hence, future research may investigate this phenomenon in other industrial and service sectors. **Second**, this study adopts a cross-sectional research method for data collection, which inhibits the ability to draw concrete conclusions on causal inference to test of the relationship between the variables in greater depth. Therefore, future research should aim to examine how the study variables measure out along a timeline. **Third**, the sample size in this study was acceptable at the level of the General Company for Textile and Leather Industry. However, at the level of industrial sector, future research may benefit from using a larger sample that is more suitable for industrial companies. **Fourth**, this study focuses on five dimensions of paradoxical leader behaviour, one dimension of workplace ostracism and three dimensions of organizational inertia; therefore, future research might include other potential dimensions. Five, the study adopted the self-report method in the sample responses, which has a significant impact on the estimates due to personal biases, and therefore future studies may choose to collect data from multiple sources.

As for the future implications of more in-depth research, it is proposed that the same model is replicated but in different settings to benefit from the positive relationship between the leader and subordinates in reducing the effects of paradoxical behaviours of leaders and organizational inertia, and indeed the negative consequences that result in weak performance. The study of positive factors such as the behavioural integrity of the leader and enabling leadership as moderating variables would reduce the sense of workplace ostracism and isolation from colleagues, and thus strengthen the foundations of participation and cooperation and reduce factors of organizational inertia; hence, combining these factors in the future with the ideas of the current research will help in the development of a more comprehensive framework for analysis.

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Ostrakizem na delovnem mestu kot posredna spremenljivka v odnosu med paradoksalnim vedenjem voditeljev in organizacijsko inertnostjo

Ozadnje in namen: Mnoge organizacije se soočajo s povečanim paradoksalnim vedenjem vodilnih, kar vodi v ostrakizem na delovnem mestu in posledično negativno vpliva na pojav organizacijske inertnosti. Glavni namen te študije je preučiti neposreden in posreden vpliv paradoksalnega vedenja voditeljev na organizacijsko na inertnost prek posredniškega vpliva ostrakizma na delovnem mestu.

Zasnova / metodologija / pristop: S tehniko naključnega vzorčenja je bila na ravni vzorca ($n = 564$) zaposlenih v tovarnah Državnega podjetja za tekstilno in usnjarsko industrijo v Iraku izvedena anketa. Za testiranje predlaganega raziskovalnega modela smo uporabili programsko opremo AMOS v.24 pri modeliranju strukturnih enačb (SEM).

Rezultati: Pokazalo se je, da paradoksalno vedenje vodilnih pomembno vpliva na ostrakizem na delovnem mestu in na organizacijsko vztrajnost. Nadalje, ostrakizem na delovnem mestu pomembno vpliva na organizacijsko vztrajnost. Poleg tega raziskava empirično podpira posredni učinek ostrakizma na delovnem mestu na odnos med paradoksalnim vedenjem vodje in organizacijsko inertnostjo.

Zaključek: Ko se pri vodilnih v organizaciji pojavi paradoksalno vedenje, bo to vplivalo na nastanek ostrakizma na delovnem mestu med zaposlenimi, s tem pa tudi na pojav organizacijske inertnosti na splošno v delovnem okolju. Na podlagi teh rezultatov naj bi ta študija pomagala voditeljem pri izogibanju paradoksalnega vedenja v smislu ohranjanja določenega ravnovesja pri ravnanju z zaposlenimi, da bi vzpostavili pozitivno delovno okolje, ki zmanjšuje ostrakizem osebja in s tem organizacijsko vztrajnost.

Ključne besede: paradoksalno vedenje voditeljev, ostrakizem na delovnem mestu, organizacijska inertnost.

Appendix: List of Measurement Items

Paradoxical Leader Behaviours

1. TSUAI: Treating subordinates uniformly while allowing individualization

TSUAI1. It uses a fair approach to treat all subordinates equally, but also treats them as individuals.

TSUAI2. Treat all subordinates equally, but looks at individual traits or personalities.

TSUAI3. Communicates with subordinates uniformly without distinction, but changes their communication styles according to their individual characteristics or needs.

TSUAI4. Determines equal workloads, but takes into account individual strengths and abilities to handle different tasks.

TSUAI5. Manages subordinates equally, but takes into account their individual needs.

2. CSCOC: Combine self-centeredness with other centeredness

CSCOC1. Demonstrates a desire to lead, but allows others to share the leadership role.

CSCOC2. Likes to be the centre of attention, but allows others to participate and to highlight them as well.

CSCOC3. Insists on getting respect, but also shows respect to others.

CSCOC4. Has a high opinion of themselves, but shows awareness of personal lack and the value of others.

CSCOC5. Confident of personal thoughts, but admits that they are able to learn from others.

3. MDCAA: Maintaining decision control while allowing autonomy

MDCAA1. Controls important business problems, but allows subordinates to process details.

MDCAA2. Makes final decisions for subordinates, but allows subordinates to control specific business processes.

MDCAA3. Decisions on major issues are taken, but lower-level delegates handle lower issues.

MDCAA4. Maintains total control, but gives subordinates appropriate autonomy.

4. EWRAF: Enforcing work requirements while allowing flexibility

EWRAF1. Emphasizes compatibility in the performance of tasks, but allows exceptions.

EWRAF2. Demonstrates work requirements, but does not manage the work accurately.

EWRAF3. Very demanding in terms of work performance, but not very important.

EWRAF4. Has high requirements, but it allows subordinates to make mistakes.

5. MDC: Maintain distance and closeness

MDC1. Recognizes the distinction between supervisors and subordinates, but does not excel in the role of leadership.

MDC2. Maintains distance to subordinates, but does not remain in isolation from them.

MDC3. Maintains differences in attitudes, but supports the dignity of subordinates.

MDC4. Maintains distance to subordinates at work, but is friendly to them as well.

The workplace ostracism

WO1. Others ignore you in the workplace.

WO2. Others leave the workplace when you enter.

WO3. They do not return greetings when I enter the workplace and greet them.

WO4. I sit alone when I have lunch at work, and no one shares with me.

WO5. Workers avoid me.

WO6. I noticed that others don't look at me in the workplace.

WO7. The workers keep me out of their discussions at work.

WO8. Others refuse to talk to me in the workplace.

WO9. Workers in the workplace treat me as if I do not exist.

WO10. My employees in the workplace did not invite me to tea or ask me about my needs.

WO11. I've been invited into conversations and discussions at work (reverse coding)

WO12. Workers stopped talking to me. (Reverse coding)

WO13. It was better for me to be the person who starts the conversation so that I can be social at work. (Reverse coding)

WO14. Co-workers interact with me only when asked to do so.

WO15. I feel ostracized by top officials.

Organizational inertia:**1. INI: Insight inertia**

INI1. Our organization has difficulty in determining how other organizations can solve the problems they face.

INI2. Our organization rarely observes changes in the external environment.

INI3. Our organization will use past information and knowledge to solve problems.

INI4. I rarely try to observe or learn new concepts to change my thinking and behaviour.

2. ACI: Action inertia

ACI1. Our organization has a deeply rooted organizational culture.

ACI2. The values of our organization are sacred, and we will never change them.

ACI3. I will follow the suggestions and requirements of others to change my ways of solving problems.

ACI4. Previous knowledge and experience can increase the efficiency of my work.

ACI5. When we change our behaviour, it's hard to convince others to do the same.

3. PSI: Psychological inertia

PSI1. We feel threatened by any organizational changes.

PSI2. We feel defensive when there are any organizational changes.

PSI3. I am concerned when I remember painful past experiences arising from change.

PSI4. Organization's staff likes current processes and don't like to change.

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V reviji Organizacija objavljamo znanstvene članke, rezultate raziskovalnega dela avtorjev. Predloženi prispevki naj bodo napisani v angleškem jeziku. Imeti morajo strukturo IMRAD, ki je običajna za znanstvena in strokovna besedila. Objavljamo dela s predmetnega področja revije, ki še niso bila objavljena in niso bila poslana v objavo v kakšni drugi reviji ali zborniku. Avtorji so odgovorni za vse morebitne kršitve avtorskih pravic.

Besedilo naj bo oblikovano za tiskanje na papirju in levo poravnano. Na začetku prispevka, takoj za naslovom, naj bo povzetek (izvleček) dolžine največ 250 besed, ključne besede, v končni – sprejeti verziji članka pa na koncu prispevka tudi kratek strokovni življenjepis vsakega od avtorjev (do 10 vrstic) in letnica rojstva (zaradi vnosa podatkov v knjižnični informacijski sistem COBISS, v reviji letnica ne bo objavljena). Na prvi strani besedila naj bodo napisani le naslov prispevka, imena in (poštni in elektronski) naslovi avtorjev članka, po možnosti tudi telefonska številka enega od avtorjev. Da bi zagotovili anonimnost recenziranja, naj se imena avtorjev ne pojavljajo v besedilu prispevka. Na koncu članka, za življenjepisi, naj bo slovenski prevod naslova, povzetka in ključnih besed.

Članek naj bo razčlenjen v oštevilčena poglavja. Naslovi članka, poglavij in podpoglavij naj bodo napisani z malimi črkami, da so razvidne kratice. Slike in tabele v elektronski obliki vključite kar v besedilo. Besedilu so lahko priložene slike in/ali tabele na papirju v obliki pripravljeni za preslikavo. V tem primeru naj bo vsaka slika na posebnem listu, oštevilčene naj bodo z arabskimi številkami, v besedilu naj bo označeno, kam približno je treba uvrstiti sliko: na tem mestu naj bo številka slike/tabele in njen podnapis. Slike bomo praviloma pomanjšali in jih vstavili v članek. Upoštevajte, da morajo biti oznake in besedila na vseh slikah dovolj velika, da bodo čitljiva tudi pri velikosti slike, kot bo objavljena v reviji. Vse slike naj bodo črno-bele z belim ozadjem; barvnih slik v tiskani verziji revije ne moremo objaviti, barve so vidne le v spletni verziji.

Članki morajo biti pred objavo v Organizaciji lektorirani. Končno verzijo mora lektorirati naravni govorc oz. lektor s primerljivim znanjem angleščine.

Podrobna navodila avtorjem za pisanje in oblikovanje člankov so na https://content.sciendo.com/supplemental/journals/orga/orga-overview.xml/Guidelines_for_Authors.pdf.

Predložene prispevke pregledata in ocenita najmanj dva recenzenta. Na osnovi mnenj in predlogov recenzentov uredniški odbor ali urednik sprejmejo prispevek, zahtevajo manjše ali večje popravke in dopolnitve ali ga zavrnejo. Če urednik oziroma recenzenti predlagajo večje popravke, se dopolnjeni prispevek praviloma pošlje v ponovno recenzijo.

Članke za objavo lahko predložite preko spletnega mesta <http://organizacija.fov.uni-mb.si>. Za nadaljnje informacije in pojasnila se lahko obrnete na uredništvo Organizacije (organizacija@um.si ali joze.zupancic@um.si).

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