South East European Journal of Economics and Business

ISSN 2233-1999 Volume 12 (2) 2017

The South East European Journal of Economics and Business, ISSN 2233-1999, is published semiannually by the School of Economics and Business, University of Sarajevo, Trg Oslobodjenja - Alija Izetbegovic 1, 71000 Sarajevo, Bosnia and Herzegovina.

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Abstracting and Indexing: This Journal is regularly indexed and abstracted by databases:

- Baidu Scholar
- Cabell's Directory
- CEJSH (The Central European Journal of Social Sciences and Humanities)
- Celdes
- Clarivate Analytics (formerly Thomson Reuters) - Emerging Sources Citation Index
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From the Editor

The second issue of the South East European Journal of Economics and Business in 2017 (Volume 12, Issue 2) brings us seven papers covering diverse topics and regions from South East Europe and beyond. In this volume the reader will find papers covering the areas of management, banking, economic restructuring, migration, as well as articles investigating the consequences of formal-informal institutional interactions on corruption and employment. A common feature of all these papers is rigorous empirical investigation, bringing us quantitative findings and data often not publicly available. As such, the volume will enrich readers with new academic findings, policy implications, as well as important inputs for the development of further research in these fields. A review of the papers follows.

Gashi, Pozega and Crnkovic in their "Cross-sectoral study of value profiles and differences between employees in the private and public sectors in South East Europe" analyze a sample of employees coming from both the public and private sectors of the six countries from the region (namely, Croatia, Italy, Hungary, Romania, Slovenia and Serbia). The authors have collected targeted survey data and used it to conduct an empirical investigation in which the employees' Hosftede Value Dimension is the explanatory variable, and is investigated primarily at the country and sectoral levels. The authors report similarities in value profiles for employees from Croatia and Serbia compared to Romania, Hungary, Slovenia and Italy, both in the public and private sectors. The research provides implications that managers and policymakers can use to understand what employees' values are, how they can be used, and how to address the challenges of human resource development in their region.

Williams, Radevic, Gherhes and Vorley investigate "The nature of corruption affecting entrepreneurship in transition economies: some lessons from Montenegro". This paper examines how the institutional environment of Montenegro impacts the nature of corruption affecting entrepreneurship development in this transition economy. It is based on business survey data supplemented with in-depth interviews with entrepreneurs. The authors report that corruption is a pervasive presence that has not been reduced despite many economic reforms. Still, Montenegro is a transition economy that has made significant strides in terms of creating a more open market economy. However, the authors believe that

reforms have often overlooked corruption, which remains prevalent, while the emerging institutional setting has left enough space for public officials and businessmen to engage in different forms of corrupt practices. The authors conclude that corruption can be viewed as a sort of cultural impediment even if most entrepreneurs are not exposed directly to it.

Kotori investigates "The probability of return conditional on migration duration: evidence from Kosovo", focusing on a topical issue coming from the diversity of migration patterns in South-East Europe. Based on her earlier work, the author investigates households' decisions to return to their home country – Kosovo – conditional on their migration duration. The empirical work is based on Kosovo census data conducted in 2011. After controlling for a number of potential influences on the decision to return, the research identifies that household return migration behaviour is indeed influenced by demographic characteristics, psychic income, and political factors. This finding supports the evidence that economic factors are not a primary driver of migration dynamics, but that a number of non-economic determinants remain important through their influence on migration. From a policy perspective, the results of this study provide no support for either a Brain Drain or Brain Gain hypothesis on return migration.

"The impact of national economy structural transformation on regional employment and income: the case of Latvia" is a study by Mihnenoka and Senfelde. The study investigates how employment structure changes and how these changes can affect the level of social welfare and economic disparities between Latvian regions. The study reveals that changes in employment structure have a noticeable impact on regional differentiation in Latvia. In addition, the authors report that although employment concentration varies across the regions in focus, it is rather persistent over time, with some occasional re-employment changes occurring in different directions, and thus, causing further regional socio-economic differentiation in Latvia.

Krasniqi and Williams bring an interesting paper from the informal economy field titled "Explaining individual- and country-level variations in unregistered employment using a multi-level model: evidence from 35 Eurasian countries". The authors rely on a 2010 Life in Transition Survey from 35 countries and employ multilevel logistic regression analysis to investigate specifically if marginalized groups are more informally employed. The obtained results suggest that younger age groups, those divorced and those with less education are more likely to be informally employed. At the higher, country level of analysis, the authors find that the prevalence of unregistered employment is strongly associated with tax morality, which the authors measure by asymmetry between formal and informal institutions. In short, the greater the asymmetry the greater the level of unregistered employment. The paper concludes by providing relevant theoretical and policy implications.

Skrabic-Peric and Konjusak investigates "How did rapid credit growth cause non-performing loans in the CEE countries?". The authors focus on eleven Central and Easter European countries (CEE) over the period 1999-2013 by applying a dynamic panel modelling in which they analyse how bank-specific variables, macroeconomic variables and credit growth indicators influence non-performing loans. The results for bank-specific and macroeconomic variables are in line with previous research on credit risk, while the influence of credit growth is identified to be time dependent. The authors report that at least two years are necessary for each type of credit growth to increase non-performing loans in this sample. The authors end the study with several implications relevant for policy makers.

"The social and financial efficiency of microfinance institutions: the case of Bosnia and Herzegovina" is an empirical investigation reported by Efendic V. and Hadziahmetovic N.. The authors rely on secondary data from Bosnia and Herzegovina (BiH) covering the period 2008-2015, and empirically investigate it through Data Envelopment Analysis. The main research attention was to investigate the financial and social efficiency of microfinance institutions in BiH, with particular reference to the effect of the latest economic crisis. There is much more space for improvement of both types of efficiency in this post-conflict country, while the authors report the improved performance of financial efficiency in comparison with social efficiency. The latest crisis hit BiH severely and affected both types of efficiency in a negative way, while the recovery started in 2010. Recovery was seen more in financial efficiency than social efficiency, and this has widened the gap between financial and social efficiency even more.

Adnan Efendic, Editor-in-Chief

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South East European Journal of Economics and Business
Volume 12 (2) 2017, 7-19
DOI: 10.1515/jeb-2017-0013

A CROSS-SECTORAL STUDY OF VALUE PROFILES AND DIFFERENCES BETWEEN EMPLOYEES IN PRIVATE AND PUBLIC SECTOR IN SOUTH EAST EUROPE

Ljuan Marko Gashi, Zeljko Pozega, Boris Crnkovic

Abstract

This study of cultures across 6 countries (7 regions) shows that each region has its own specificity and its own unique employee value profile. Value profiles have been explored as a potential diagnostic tool on the basis of Hofstede's value dimensions in the service of human resource development at the local level. The resulting employee value profiles are based on a representative sample of employees in the private and public sectors. Significant similarity in value profiles have been found for employees from Croatia and Serbia compared to Romania, Hungary, Slovenia and Italy, both in the public and private sector. The research results suggest the direction that managers and policymakers need to take in order to understand what employees' values are, how they can be used, and how to address the challenges of human resource development in their region.

Keywords: *employees, private/public sector, enterprises, local administrative units, countries, regions, human resources, value dimensions.*

JEL classification: *M50*

1. INTRODUCTION

The research questions raised in this paper are: What are the differences in value dimensions between employees in public and private sector? In what way can employees' value profiles be compared and how can they assist in the selection of strategies for development of human capital at local level? This research follows the study of cultural differences in international management by Geert Hofstede. We offer a methodological contribution to the study of value dimensions, i.e. value profiles, which can be compared and used as a diagnostic tool in human resource management (HRM), with various possible applications. The countries of interest to us are Croatia, Serbia, Hungary, Romania, Slovenia and Italy.

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1.1 Hofstede value dimensions of organizational culture

Hofstede describes culture as the "collective programming of the mind" that distinguishes members of one group of people from another (Hofstede 2001). Hofstede first reduced the differences between cultures to four basic dimensions. All other differences, he argued, can be found in one or more of these dimensions: Power Distance Index (PDI), Individualism versus Collectivism (IDV), Masculinity versus Femininity (MAS) and Uncertainty Avoidance Index (UAI). After additional research, he added Long Term Orientation versus Short Term Normative Orientation (LTO) (Hofstede and Hofstede 2005) and Indulgence versus Restraint (Hofstede and Minkov 2010).

PDI or concentration of power shows the extent to which a society accepts the fact that the power within institutions and organizations is unevenly distributed among individuals. PDI is about hierarchy, i.e. what is considered a normal work process and the right to participate in decision-making. In some countries it is common to follow the person in charge, while in others people in leadership positions and employees relate to each other on the basis of equality. In societies/organizations with high PDI, centralization is popular (Hofstede and Minkov 2010).

UAI shows the degree to which a society/organization feels threatened by uncertainty and in which situations tries to avoid them by providing rules or other means to ensure safety. UAI relates to the extent to which people are willing to take this risk. It is the extent to which people want their behaviour (and the behaviour of others) to follow certain predictable patterns. This dimension is about how much space exists for coincidence, improvisation, or letting things go their own way (even if it is the wrong way). While some people prefer only clearly defined instructions, others can handle open instructions or questions (Struch, Schwartz and Van der Kloot 2002).

IDV indicates the extent to which social frameworks exist and to what extent the individual is expected to care only about him/herself and his/her immediate family/group. Individualistic cultures clearly distinguish between one's own and others' social groups. In collectivistic cultures it can be difficult for a person to look for the possibility of individual action, or it may be unsatisfactory not to participate in group activities. High individualism emphasizes personal characteristics, individual initiative and achievement, the ideal of leadership and management. Work tasks are above connections and kinship and decisions on employment depend on knowledge, skills and rules. Management in individualistic cultures is the management of individuals, wherein one believes in individual decision-making processes and private solutions. Freedom, independence and equality are promoted, which can then turn into the value of universalism (McEwan 2001).

MAS indicates the extent to which gender determines the roles that men and women have in society. If the role of gender in a country is clear, it is dominated by men. Masculine organizational culture is characterized by competitiveness, awards and the values of recognition, promotion, initiative, achievement and challenge. Society is feminine when the sex roles overlap, so both men and women are considered modest and gentle, focused on the quality of existence. Feminine organizational culture is more inclined to compromise, negotiation and intuition than masculine organizational culture (Feather 2004).

LTO shows the extent to which a society bases its decisions on tradition and events from the past or how much they are based on short-term, current income, in contrast to what is desired in the future. It is about commitment, respect for tradition and hard work, which pays off gradually because business can develop more and more. For short-term orientation, changes may occur faster and liabilities and tradition do not slow down the process. The LTO shows how important the history of a particular area is for the present and future, and to what extent people tend to be proud of their origin (Spangler 1992).

1.2 National culture and work

Croatia, as a transitional, post-communist country still has low innovation capacity and suffers from a social capital deficit. It is burdened by traditional values considered to be dysfunctional for innovation, such as cooperativeness deficiency, low trust in institutions, state paternalism, and opportunism. Croatians are in general sceptical or conservative about new ideas or methods from both locals and non-locals. Although Croatians are direct in communication, they do not tend to openly offer constructive critics to colleagues about their performance at work. This is partly due to the belief that a person cannot be changed. Typically, workers express opinions about their dissatisfaction when a particular job is complete (Gilliland 1995; Glenny 2000). In Croatia, Hofstede's value dimensions have been used to determine regional differences (Rajh, Budak, and Anić 2016), potential for innovation (Lažnjak 2011), comparison with other countries (Podrug, Filipović, and Stančić 2014) and with regard to examination of a specific value dimension (Matic 2006).

According to Falkné Bánó (2014), Hungarian business culture has less respect for management positions; hierarchy no longer plays an important role at the workplace. It is assumed that there is no strong link between employees' performance and commitment to their organisation. The social dimension of work remains important to achieve satisfaction at work. Achievement-orientation in Hungarian culture can be interpreted as a desire for a performance-focused work environment. Hungarian employees reject tough and aggressive behaviour and value assertiveness. In traditional organizations recognition was not linked to performance. As a result, employees were unmotivated to use their capabilities at a level higher than minimally necessary (Bakacsi and Takács 1998; Bakacsi et al. 2002). Some studies suggest that Hungarians are very operative and autocratic, although creative and flexible (Molnár 2004).

Cohen and Federico (2001) define Italy as one of the world's richest and economically advanced countries due to the fact that small Italian firms benefited from unique social interactions resulting from shared values and belief systems. Italy is associated with other countries that tolerate more power distance (Tavanti 2012). While Italians accept and somehow expect that some groups in society will be more powerful than others, they often express cynicism about persons in positions of authority, generally supporting the breaking of petty rules, ridiculing authority or people in positions of power (Flower and Falassi 2006). Italians 'avoid risk and uncertainty' in everyday life, prefer friends over strangers and familiar over new or strange situations (Gannon and Pillai 2010). With regard to managerial culture, in high-potential management men are preferred (Traquandi and Castellucci 2002).

In Romania, there are studies that refer to similar values with other Balkan countries (Luca 2005) and ex-communist countries, with the perception of inequalities as expected and desirable (Muruntelu 2010). While management strategies applied in Romanian companies are characterized by difficulties in planning, lack of innovation, evolving instability, the most frequent form of organisation is pyramidal, while employees prefer a more casual rather than competitive surrounding (Rusu, Isac, and Cureteanu 2015). It is also estimated that in the future individualism will increase with Romanian job market penetration by multinational companies and consistent foreign investments (Marinaş 2010). Bodea presents a model which shows significant links between the beliefs, values, attitudes and behaviours of Romanians: excellence influences attitudes toward work as expressed through behavioural characteristics - discipline, skills, professionalism; valuing honesty is associated with the spirit of family, hospitality and freedom; confidentiality is negatively correlated with the tendency to betray; power correlates with the desire to be a leader and with pride and stubbornness; inclination towards adventure is correlated with creativity, innovation, spontaneity and fun (Bodea 2013).

Slovenian managers are characterised by low power distance and high individualism, while high uncertainty avoidance prevails (Jazbec 2007). Slovenian entrepreneurs primarily value achievements, but lack the element of risk-taking; they prefer predictable and stable situations. The reason for this lies in the value of obedience and security in general, and in the avoidance of making mistakes, which is strongly present (Jazbec 2005). Obedience was highly encouraged in the school system in Slovenia, where the ideal student was one who was able to repeat the teacher's knowledge (Trstenjak 1991). When uncertainty avoidance is encouraged, then experimenting, imagination and the motivation to be different are suppressed, which presents an obstacle to a society to become innovative (Jazbec 2005). Slovenian managers prefer a feminine organisational culture (Prašnikar, Pahor and Vidmar 2008).

As a consequence of the turbulent recent past in the Balkans, Serbia has been suffering economic crises, hyperinflation, a UN embargo and problems with privatisation. According to Gordy (1999), Serbian culture is characterised by a conflict between the traditional rural values that were in power throughout the 1990s and the modern urban values of Belgrade and other cities that took charge after 1999. A comparative study of Prašnikar, Pahor and Vidmar (2008) concludes that Serbians have a more mechanistic (insider) view of the world and ascribe more importance to status. According to Cerović and Aleksić (2005), Serbian tradition, experiences with socialism and nationalistic ideology have revived these values, while the past, more than the present or future, plays an important role in the culture of the Serbian people. The findings of Mojić (2003) present Serbian culture as characterised by small power distance, high uncertainty avoidance and masculinity.

2. APPLICATION OF CULTURE IN HRM

There is a high intertwinement between all of Hofstede's model dimensions and the basic functions of HRM. PDI can be directly applied in the company through the determination of an organizational structure model, the way that organizations work and their decision-making systems. PDI has direct impact on

setting, maintaining or improving the border of authority in the company, which methods will be used to achieve authority and strengthen it, how to balance inequalities in participation in business processes, how to prevent the discontent of workers and how to raise their motivation. PDI can be visible in the process of selection and recruitment, as it can show the organization's functioning and existing power system. PDI may affect the system of rewards and sanctions by which a manager can neutralize dissatisfaction or, in turn, further boost dissatisfaction with incorrect decisions or an unfair rewards system. UAI mostly finds its application through the processes of job analysis and the delegation of tasks and teams, and consequently through employees' performance management as a separate function of HRM. IDV places emphasis on individual initiative and achievements, especially contributing to the selection of new employees, matching skills and rules, individual and team work. In the context of HRM it is extremely important to stimulate employee innovation and the autonomy of the individual decision-making process and thus increase efficiency. IDV is applicable in companies through the establishment of a reward system based on the principle that significantly higher awards are given to the best and the most responsible employees. The use of MAS is most evident through the establishment of the company's style of management, but also through the systems of teamwork and task delegation. Managers can apply LTO in a wider organisational context and in planning through a process of selection for new workers, staff maintenance and layoffs.

Therefore, the value differences measured by Hofstede's value dimensions (HVD) can highlight the main features of employee behaviour at work and the value system of the observed respondents, which can be very useful both for business decision makers at the enterprise level and through political/administrative decisions or attracting investment at the state policy level.

3. DATA COLLECTION AND RESEARCH METHODOLOGY

3.1. Scope and purpose of research

The subject of this study is testing HVD as an indicator of the organizational culture of employees in the private and public sectors in their territories, which can be used for determining the state of human resources (HR) at the regional level. We would like to examine to what extent the value profiles can be used to show similarities and differences between the public and private sectors, whether we can talk about public sector culture and private sector culture through value profiles. The paper aims to highlight the importance of values in HRM in achieving a more successful management system. Therefore, it can be hypothesized that: H1: There are value profiles of employees in the private and public sectors in different countries / regions, which are formed on the basis of HVD and determine the state of HR; H2: these value profiles differ between countries and between public sector employees and private sector employees in 6 countries/7 regions.

3.2. Research process and sampling

The research was conducted on a sample of employees in enterprises and local administrative units in 2013 in six European countries: Croatia, Italy, Hungary, Romania, Slovenia and Serbia. Respondents are employees from the same city/region (employed in the public and private sectors from the same service industry in their territories). Along with the sociodemographic questionnaire, a custom instrument "Values Survey Module 1994 (VSM 94) International Questionnaire (Copyright © Geert Hofstede BV)" was used, standardised on the world population. Sampling was done strictly according to the Hofstede research requirements. The questionnaires were translated into Hungarian, Serbian, Slovenian, Croatian, Italian and Romanian.

The total number of questionnaires sent out is 1580, out of which 1248 questionnaires were returned (78.98%). In total, 1166 questionnaires were filled out correctly (73.79%), which is the number that entered into further data processing and analysis. Questionnaires were distributed at local administrative units and enterprises that had accepted participation with the support of the managers of the enterprises and the mayors of the municipalities. Employees were encouraged to fill out the questionnaire anonymously and were informed about the procedure orally and in writing. The high response rate is the result of invested effort for a long period of time on planning the distribution of the questionnaire, flexibility with timing and the personal contact of authors with various institutions in all six countries through international and interdisciplinary projects.

The sample was divided into subsamples: 729 respondents from the private sector and 437 from the public sector. Each subsample was analysed according to the country/region criteria (in the case of Serbia, the north and south of the country). Respondents from Slovenia (public sector) and Italy (private sector) were taken as "control subsamples". The research

included 567 men and 599 women, aged 19-72 years, with the highest percentage of respondents in the age range 40-50 years (435 respondents, 37.2%). In order to maintain balance within the sample, employees' management levels have been also taken into account, with employees from the top (75), middle (281) and lower management (810) and a balanced number of respondents with all educational levels, i.e. higher education (424), high school education (458) and highly qualified/qualified/semi-qualified (284).

3.3. Variables

The independent variables of the model are categorical variables: the region/state of residence of the enterprise/local administrative unit (private/public sector)- Croatia (eastern, Vukovar – Srijem county and Osijek – Baranja county), Italy (north, Province di Monza e della Brianza), Hungary (north-east and south, Baranya and Hajdú – Bihar), Romania (western, Judeţul Timiş and Judeţul Caraş – Severin), Slovenia (western, Goriška region), the southern Serbia region (Jablanica and Pčinja districts) and the northern Serbia region (south Bačka and north Bačka districts). The dependent variables are the employees' HVD as measured by indexes: PDI, IDV, MAS, UAI and LTO (characteristics).

3.4. Mathematical - statistical data processing

The data collected in this study were processed by selected mathematical and statistical procedures. We started with processing data at the level of descriptive statistics on nonparametric values. The characteristics of respondents' answers on HVD, in relation to whether they work in the private or public sector, or from a particular country/region, have nonparametric properties and have been analysed with nonparametric procedures by frequency distribution. Multivariate methods of MANOVA and discriminative analysis were used. The following univariate methods were used: Roy's test, Pearson's contingency coefficient, multiple correlation coefficient (R), the coefficient of discrimination, Student's t-test for proportions, Mahalanobis distance and cluster analysis. Hofstede's formulas were used for calculating the value dimensions indexes: PDI, IDV, MAS, UAI and LTO. Methods of proving the existence of similarities or differences between subsamples confirm the hypothesis of similarity or reject it (confirm the alternative hypothesis), or show the existence of differences. A critical p-value was used; if $p > 0.100$, there is no reason not to accept the initial hypothesis. To discard the initial hypotheses, two thresholds of significance were used: $0.10 > P > 0.05$ and $p < 0.05$ (significant differences).

4. ANALYSIS OF HOFSTEDE'S VALUE DIMENSIONS OF EMPLOYEES IN THE PRIVATE AND PUBLIC SECTORS

By comparing the scores for employees between countries and between sectors, a few tendencies can be seen. There is a tendency of equalizing scores in all evaluated dimensions for Serbia and Croatia, except for the IDV dimension, which is significantly higher for Croatia. PDI is extremely low for Italy, which is specific because it includes only respondents from the private sector; it shows a close relationship without obstacles between workers and employers. Also, PDI are similar for all countries/regions, except for Romania, which has a lower PDI compared to other countries. UAI seems to be a feature of former Yugoslav countries and it is typical for Croatia, Serbia and Slovenia, and also for Hungary, which has the highest score (the lowest is for Romania). The MAS dimension varies the most, while LTO is quite constant, with a slightly higher score for Romania.

Table 1: Sample per country and sector

Country/region/gender/ management		Gender (n; %)		Private/Public sector (n)		Total
		male	female	Private	Public	
Country /region	Croatia	67; 38.1	109; 61.9	95	81	176
	Italy	14; 46.7	16; 53.3	30	0	30
	Hungary	46; 29.5	110; 70.5	115	41	156
	Romania	51; 44.7	63; 55.3	50	64	114
	Slovenia	11; 26.2	31; 73.8	0	42	42
	Southern Serbia	169; 61.2	107; 38.8	204	72	276
	Northern Serbia	209; 56.2	163; 43.8	235	137	372
Total		567; 48.6	599; 51.4	729	437	1166

Table 2: HVD indexes by private/public sector by country/region.

country/region (private/public sector)/ value dimensions	PDI	UAI	MAS	IDV	LTO
Croatia – private sector	48.89	78.52	20.32	81.79	50.95
Croatia – public sector	37.35	87.72	30.86	69.70	43.46
Croatia	43.58	82.76	25.17	76.22	47.50
Italy – private sector	19.00	81.00	8.67	64.00	51.33
Hungary – private sector	59.30	101.43	11.83	60.22	56.52
Hungary - public sector	55.98	97.19	24.63	66.46	49.26
Hungary	58.43	100.32	15.19	61.86	54.61
Romania – private sector	35.50	42.10	41.40	58.9	66.00
Romania - public sector	29.22	50.16	53.44	53.75	55.94
Romania	31.97	46.62	48.15	56.00	60.35
Slovenia – public sector	38.33	97.26	-21.43	83.69	54.29
southern Serbia – private	34.85	84.07	38.92	66.05	41.18
southern Serbia - public sector	51.66	62.50	43.19	63.46	51.39
southern Serbia	39.24	78.44	40.04	66.16	43.84
northern Serbia – private sector	38.17	88.94	22.64	72.79	48.68
northern Serbia - public sector	53.76	84.52	19.49	59.45	49.34
northern Serbia	43.91	87.31	21.48	67.88	48.92

It is noticeable that there are differences between and within countries/regions. For example, Croatia has an almost 10 percentage unit (p.u.) difference between employees in the public and private sectors, followed by Hungary (4-7 p.u.), Romania (5-8 p.u. with the exception of LTO 11 p.u). In southern Serbia there is a major difference between the scores for PDI (17 p.u.), UAI (22 p.u.) and LTO (10 p.u.), while in northern Serbia for PDI there is 15 p.u. and IDV 13 p.u. difference.

The index score for the public sector shows a similarity of PDI for both Serbian regions and Hungarian respondents. Croatian and Slovenian respondents also show a similarity for PDI, while Romanian respondents from the public sector have the lowest index of PDI. The relative uniformity of PDI scores for Serbian and Romanian respondents can be seen for respondents from the private sector, while the index scores for Croatian and especially Hungarian respondents are higher.

For the respondents in the public sector in general, a balanced but generally higher index score of UAI is observed, except for the Romanian and southern Serbian samples, whose indexes are lower than an average of 22 p.u. For UAI, we again see balanced scores for Serbian respondents, which are mostly similar to Italian and Croatian respondents, while the score of Romanian respondents in enterprises is half the value of the score of Serbian respondents. At the same time, Hungarian respondents have higher UAI than respondents from other countries/regions.

For MAS, the differences between respondents can be seen even more clearly, where respondents in companies from northern Serbia and Croatia have more emphasized elements of feminine organizational culture, unlike southern Serbia and Romania, where the scores are almost doubled. At the same time, the number of MAS participants from Hungary is half that of respondents from the northern Serbia and Croatia, as well as extremely low MAS in control group from Italy. However, it is still 10 p.u. lower than the highest score of MAS, which is a characteristic of Romanian public sector employees. It is clear that respondents from the public sector in southern Serbia significantly differ in terms of masculine working culture than their colleagues in other countries (including northern Serbia) because their index score is almost twice as high.

IDV indexes are almost equal for employees from the public sector (except Slovenia, where this index is much higher), while the index of Romanian respondents is somewhat lower compared with that of other index scores. Respondents from enterprises have the highest score in Croatia and the lowest in Romania. Serbia is characterized by a high score for respondents from the north of the country, higher than the score in Hungary. Reduced LTO is noticeable for respondents from southern Serbia compared to northern Serbia and Croatia, while respondents from Hungary and Romania have significantly higher scores. LTO for the public sector is similar in all countries/regions, except in Romania where it is slightly higher.

4.1. Differences between respondents employed in the private sector

Based on the value of p = .000 (analysis MANOVA: n=5, F=6.827) and p = .000 (discriminative analysis: n=5, F=6.871) there is a difference and a clearly defined border between subsamples of respondents.

As p <.1, there is a significant difference between respondents (country/region) in value dimensions: PDI (.020), UAI (.000), MAS (.000), IDV (000) and LTO (.000). The discrimination coefficient refers to the fact that the biggest contribution to the discrimination is between subsamples of respondents in value dimensions as follows: MAS (.121), UAI (.037), LTO (.033), IDV (.022) and PDI (.017).

The logical sequence of research was to determine the characteristics and homogeneity of each subsample and the distance between subsamples by country/region. A clearly defined border between subsamples of respondents has been found, i.e. the possibility to determine the characteristics of each subsample and then the value profiles, based on the responses on the HVD. The MAS index defines the features of each subsample the most, since its contribution to features is 52.601%, followed by: UAI (16.087%), LTO (14.368%), IDV (9.565%) and PDI (7.391%). Furthermore, as an example, 64 out 95 respondents have characteristics of the Croatian subsample, which shows higher homogeneity; this means that 31 respondents have other characteristics and not characteristics of their group. The homogeneity of the Croatian sample is therefore 67.37%, which confirms the chance that a respondent with similar characteristics would belong to a Croatian subsample; consequently it is possible to forecast with a certain reliability. Similarly, the homogeneity of the Italian sample is 53.33%, the Hungarian 62.61%, the Romanian 74%, the southern Serbian 57.35% and the northern Serbian 61.28%. This confirms the quality of the samples and their representativeness.

By calculating Mahalanobis distance between countries/regions of respondents, we get one more indicator of similarity or difference.

Based on the displayed dendrogram, respondents from Croatia and northern Serbia are the closest to one another. The biggest difference is between respondents from Croatia and Italy. A distance of .70 lies between Croatia and northern Serbia in relation to southern Serbia, followed by a distance of .75

Table 3: Significance of differences between subsamples – private sector.

	c	R	F	p	k.dsk
PDI	.190	.135	2.707	.020	.017
UAI	.219	.188	5.285	.000	.037
MAS	.337	.329	17.559	.000	.121
IDV	.220	.181	4.932	.000	.022
LTO	.227	.192	5.535	.000	.033

k.dsk - discrimination coefficient

Table 4: Mahalanobis distance between subsamples – private sector.

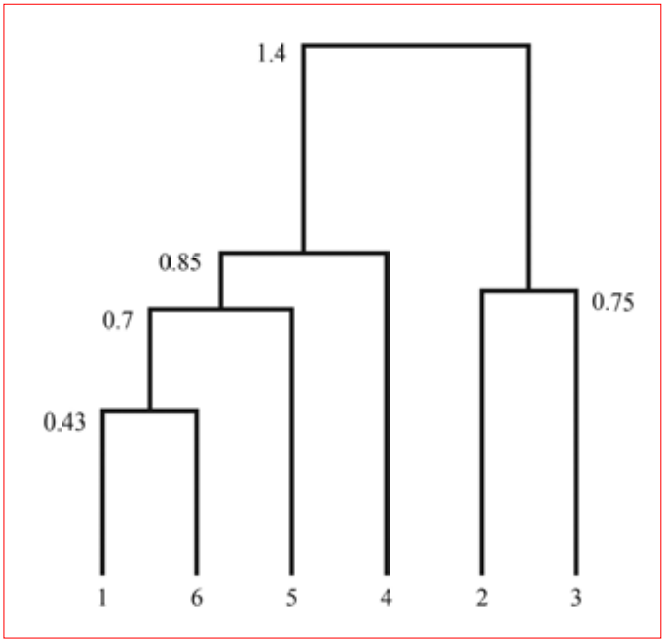
	Croatia	Italy	Hungary	Romania	southern Serbia	northern Serbia
Croatia	.00	.93	.96	.73	.71	.43
Italy	.93	.00	.75	1.39	.83	.74
Hungary	.96	.75	.00	1.29	.95	.97
Romania	.73	1.39	1.29	.00	.88	.72
southern Serbia	.71	.83	.95	.88	.00	.55
northern Serbia	.43	.74	.97	.72	.55	.00

Table 5: Grouping of subsamples of countries/regions – private sector.

level	relation
Croatia, northern Serbia	.43
Croatia (with northern Serbia), southern Serbia	.70
Italy, Hungary	.75
Croatia (with northern Serbia and southern Serbia), Romania	.85
Croatia (with northern Serbia, southern Serbia and Romania), Italy (with Hungary)	1.40

between groups in Italy and Hungary. A distance of .85 is calculated between a group led by Croatia (with northern Serbia and southern Serbia) and Romania. Finally, the greatest distance of 1.40 is between the group led by Croatia (with northern Serbia, southern Serbia and Romania) and Italy (with Hungary). It can be observed that there is a tendency for the grouping Serbian and Croatian subsamples and their separation from the Hungarian and Italian subsamples, which are grouped on the other branch of the dendrogram.

Figure 1: Dendrogram of subsamples – private sector.

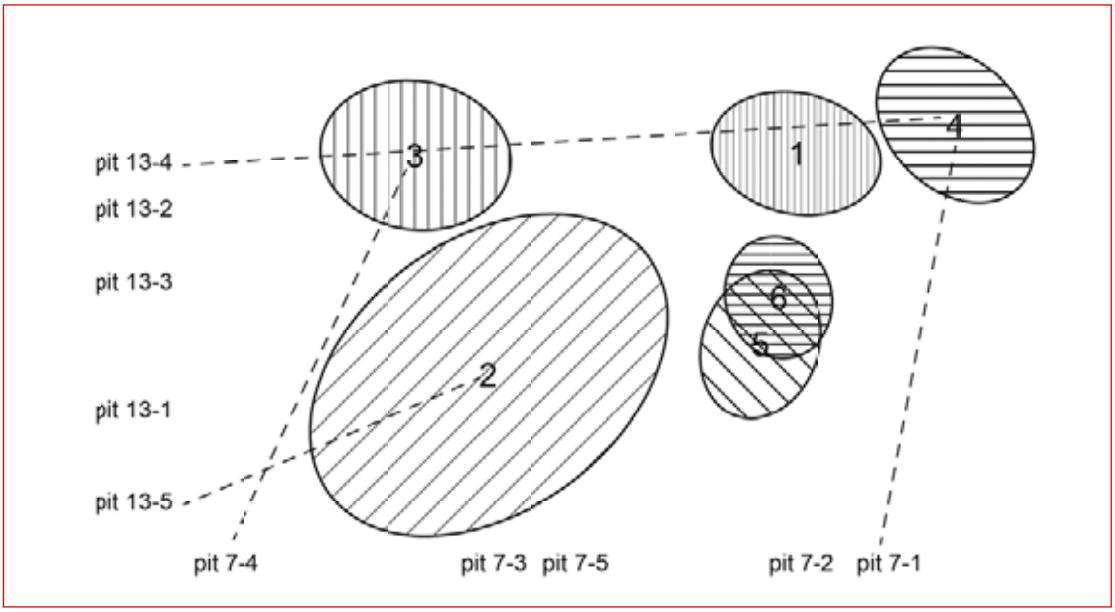


Croatia (1) Italy (2) Hungary (3) Romania (4) southern Serbia (5) northern Serbia (6).

The ellipses show the relationship between each subsample and its characteristics, in relation to the two most discriminating HVD: MAS and UAI. Respondents' answers had two types of modalities: 1) "of utmost importance", "very important", "of moderate importance", "of little importance", "of very little or no importance"; and 2) "always", "usually", "sometimes", "seldom", "never".

The horizontal axis is MAS (represented by question 7) presented with responses on a 5-point scale. The vertical axis is the UAI (question 13) also presented with a responses on a 5-point scale. It can be observed that in relation to MAS for the Hungarian subsample (3) the most frequent answer is 'of little importance', and for the Romanian subsample (4) 'of utmost importance'. For UAI, for the Italian subsample (2) the most frequent answer is 'always', while for the Romanian (4) 'usually'. There is a similarity of answers from northern and southern Serbia (6 and 5) which can be seen from the overlapping of the two ellipses.

Figure 2: Ellipses representing countries/regions of respondents in relation to their answers for MAS and UAI – private sector.



pit = question; Croatia (1); Italy (2); Hungary (3); Romania (4); southern Serbia (5); northern Serbia (6); of utmost importance (question 7-1); very important (question 7-2); of moderate importance (question 7-3); of little importance (question 7-4); of very little or no importance (question 7-5); never (question 13-1); usually (question 13-2); sometimes (question 13-3); usually (question 13-4); always (question 13-5).

4.2. Differences between respondents employed in public sector

Based on value of p = .000 (MANOVA analysis: n=5, F=5.277) and p = .000 (discriminative analysis: n=5, F=5.266), there is a difference and clearly defined border between respondents.

As p <.1, there is a significant difference between respondents in: PDI (.000), MAS (.000), IDV (.000) and LTO (.000). A latent characteristic is a characteristic in which there is no clear difference between respondents and the discriminative analysis included it in the research structure. A latent characteristic here is: UAI (.146). The discrimination coefficient shows that the biggest difference between respondents is at: LTO (.088), IDV (.084) and PDI (.082).

Based on the same methodology applied for the analysis of private sector respondents, the characteristics and homogeneity of each subsample has been determined and the distance between subsamples by country/region. Clearly defined borders between subsamples of respondents were found, which made the characteristics of each subsample possible to determine; this has enabled the formation of value profiles. LTO defines the features of each subsample of respondents the most because its contribution to features is 25.882%, along with IDV (24.706%) and PDI (24.118%), MAS (20,000%) and to a lesser extent UAI (5.294%). The homogeneity of the Croatian sample is 59.26%, Slovenian 59.52%, Hungarian 58.54%, Romanian 73.44%, southern Serbian 66.67% and northern Serbian 53.28%. The Mahalanobis distance between countries/regions of respondents shows one more indicator of similarity or difference.

Based on the displayed dendrogram and Table 7, respondents from Croatia and northern Serbia are the closest (.55), followed by a distance of .74 between them and a group of Slovenians and south Serbians. A distance of .88 is calculated between groups from Croatia (with northern Serbia) and Romania. It can be observed that there is a tendency for the grouping of Serbian and Croatian subsamples again. Both form a

Table 6: Significance of differences between subsamples – public sector.

	c	R	F	p	k.dsk
PDI	.345	.265	6.501	.000	.082
UAI	.195	.137	1.645	.146	.018
MAS	.348	.282	7.458	.000	.068
IDV	.344	.296	8.320	.000	.084
LTO	.283	.229	4.796	.000	.088

k.dsk - discrimination coefficient

Table 7: Mahalanobis distance between subsamples – public sector.

	Croatia	Hungary	Romania	Slovenia	Serbia south	Serbia north
Croatia	.00	.94	.91	1.28	.92	.55
Hungary	.94	.00	1.17	1.36	1.09	.77
Romania	.91	1.17	.00	1.31	.90	.67
Slovenia	1.28	1.36	1.31	.00	.74	1.05
Serbia south	.92	1.09	.90	.74	.00	.59
Serbia north	.55	.77	.67	1.05	.59	.00

Table 8: Grouping of subsamples of countries/regions – public sector.

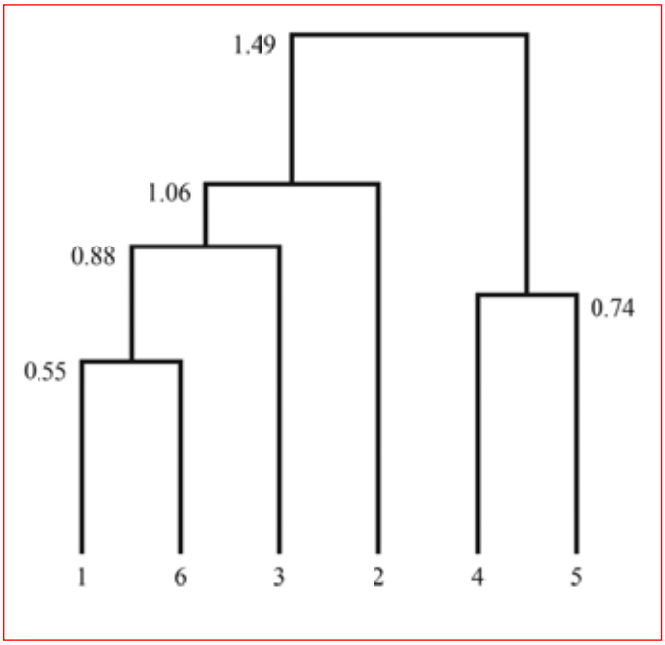
level	relation
Croatia, Serbia north	.55
Slovenia, Serbia south	.74
Croatia, Romania	.88
Croatia, Hungary	1.06
Croatia, Slovenia	1.49

separate branch of dendrogram with the Hungarian and the Romanian subsamples, while Slovenian and south Serbian subsamples are grouped on the other branch of the dendrogram.

The ellipses show the relationship between each subsample and its characteristics in relation to the two most discriminating HVD: IDV and PDI, confirming the dendrogram results. The horizontal axis is IDV (represented with question 8), while the vertical axis is PDI (question 3) both presented with responses on a 5-point scale. Figure 4 shows the clear distinction of the Slovenian subsample (4) from the other subsamples. In relation to IDV, for the Slovenian sample the most frequent answer is 'of the utmost importance', and for the Croatian sample (1) 'of moderate importance'. For PDI, the most frequent answer for the sample from south Serbia (5) is "of utmost importance" and for the Croatian subsample it is 'of moderate importance'.

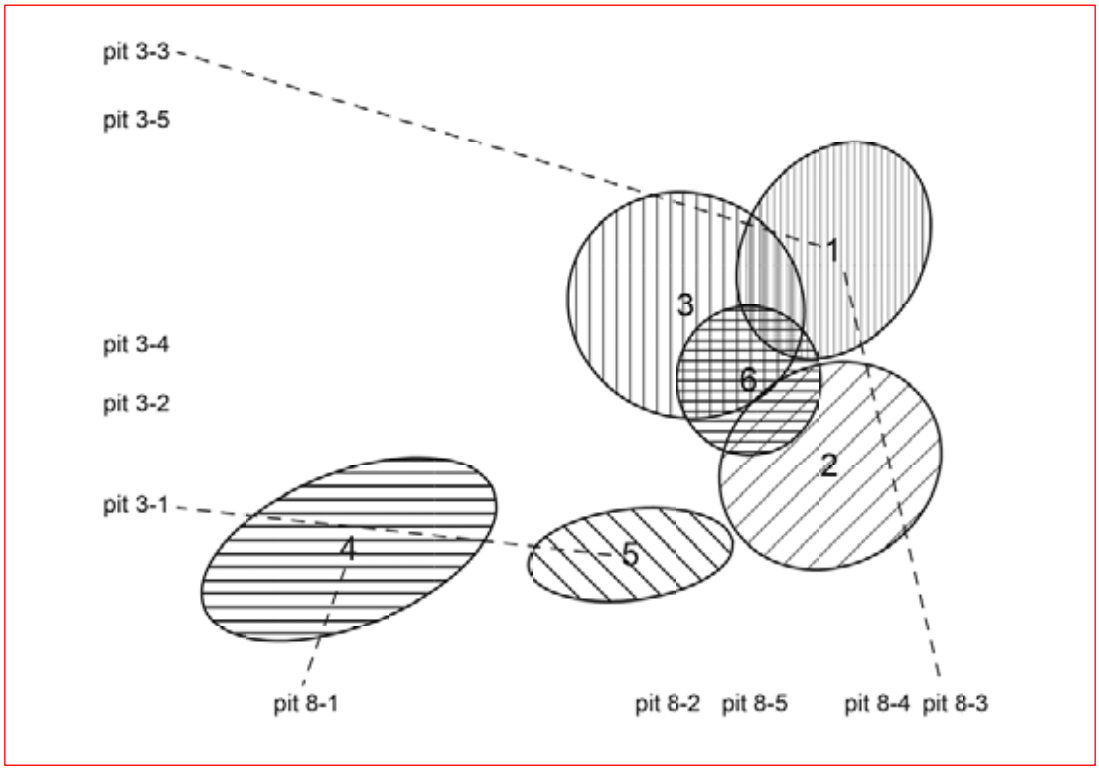
With the research and analysis presented here, the hypotheses of the paper have been undoubtedly accepted. It has been confirmed that there are value profiles of employees in private and public sector in different countries / regions that are formed on the

Figure 3: Dendrogram of subsamples – public sector.



Croatia (1) Hungary (2) Romania (3) Slovenia (4) Serbia south (5) Serbia north (6)

Figure 4: Ellipses representing countries/regions of respondents in relation to their answer for IDV and PDI – public sector.



pit = question; Croatia (1); Hungary (2); Romania (3); Slovenia (4); southern Serbia (5); northern Serbia (6); of utmost importance (question 8-1); very important (question 8-2); of moderate importance (question 8-3); of little importance (question 8-4); of very little or no importance (question 8-5); of utmost importance (question 3-1); very important (question 3-2); of moderate importance (question 3-3); of little importance (question 3-4); of very little or no importance (question 3-5).

basis of HVD and can be used to determine the state of HR at the regional level. There is a difference between enterprises and between local administrative units in relation to the individual responses of employees on HVD. Value profiles differ between public sector employees and private sector employees in the 6 countries/7 regions.

5. SYNTHESIS OF RESEARCH FINDINGS

In accordance with previously established objectives, methodological approach and research questions and based on the research performed, it can be concluded that it is possible to determine the characteristics of each subsample and thus the value profiles of employees in each country. The study showed the smallest difference between subsamples of respondents from northern Serbia and Croatia, and the biggest difference between employees in the private sector in Romania and in Italy (alongside Hungary). For the public sector, there is a similarity of the results of respondents from Croatia and North Serbia and a sharp difference between respondents from Croatia and Italy. Finally, the study found the greatest distance between employees of the public sector in Croatia, Serbia and Romania on one side and Italy and Hungary on the other.

The most important research results are related to the proven similarity of HVD scores of employees in Croatia and Serbia, which can be explained by the large similarities in organisational behaviour, i.e. mentality, between these nations, as well as cultural and social affinities, years of life together in the same country and the similarity of administrative culture. Also, research has shown that the post-Yugoslav states in this research are very similar in terms of UAI, which again could be explained by the similarities in the cultural setting, similar economic standards and way of life, as well as common social values that were dominant in Yugoslavia, namely in life and work-related social relations. These values would include, among others: a tendency to improvise, aversion to planning, risk aversion, lack of innovation and an entrepreneurial way of thinking, and so on. The causes of these similarities are also connected with the development that these nations have recorded through history, as well as similar privatization challenges and transitional circumstances that have created additional patterns of behaviour in the observed countries. The research results suggest the direction that policymakers in these countries need to take in order to understand and then address and/or change work habits, systems of values, ways of thinking and behaving in the organisational setting, e.g. administration practices, with the goal of securing the capital for faster and greater economic growth. Especially for Croatia and Serbia, which have such similarities in organisational culture, with decreasing MAS and growing IDV, it appears that the potential for innovation is not yet fully understood by the authorities, who do not sufficiently value this cultural shift. There is a constant brain drain from these countries and much more can be done with regard to making favourable policy, and a better societal environment and structure for innovation.

6. IMPLICATIONS FOR HRM

Each region, therefore, has its own specificity and its unique employee value profile. This paper forms a concept of the value dimensions of employees as an important HR development factor. With this methodology, values can be observed in a more detailed way. HRM managers can use value profiles for various HRM functions within organisations as well as at the regional level. The regional value profiles of employees can be used to identify potentials of HR of a particular region or municipality, indicate possible directions of development of the region and its resources, and to that end, to select an adequate intervention in HRM at the local level.

Any reorganisation of an enterprise or local administrative unit should involve adequate knowledge about HR and their values in order to induce better management, professionalisation of work and the creation of new competencies of employees. A better understanding of the values at the core of employees' motivation is very important, especially with regard to public service reform, which is on-going in many of the countries involved in this research; learning about the values of public servants can offer better insight into the potential and quality of public services, the pace of reform and what can be expected in this regard in the future. It is important to be open to innovation and development, which comes from the employees themselves. Given the unfavourable socioeconomic indicators and persistent poverty rates in the countries of South East Europe, it is time for policy makers to pay attention to understanding HR as the most valuable national resource.

How can a HRM manager use value profiles to shape HRM functions? First, an HRM manager should be able to create and implement such planning for HR development that would standardise knowledge about employees' values at the organisational level. This includes knowledge of the characteristics of these values. Second, in addition to a standard selection

procedure, internal training or performance feedback delivery, HRM managers should always include a questionnaire of employees' values. This practice should lead to their ability to create value profiles for teams based on calculations using frequencies, as in our research. Third, HRM managers should be able to compare the value profiles of their employees (teams).

For example, with regard to the creation of teams, an HRM manager would be interested to know what kind of capacity the teams of employees in a certain country or region have or are able to show. Results of this study show that differences between value profiles are significant at both national and regional level and imply that values should be taken into account in functions of HRM i.e. in the processes of 1) selection, hiring, training and onboarding and retention of personnel, on one side and on the other side 2) keeping employees relations complementary to development and growth of an organisation/company (e.g. teaming up, adjustments to new trends and course change, testing new methodologies or innovative techniques).

More specifically, when calculating value profiles, an HRM manager can compare the groups of employees within a company or its branches in different countries and assess their strengths as (national/regional) teams and address their weaknesses through targeted training, the change of focus on certain training topics and the dynamics of the training process. The added value of such an approach would be in using an organization's own resources better to address its weaknesses. In other words, HRM managers can better use their own skills in selection and hiring by asking questions which go one step further in knowing their (future) employees, i.e. questions about their values.

In the selection process, HRM managers should go beyond the selection of one employee to fit the team. Instead, HRM managers should use information on employees' values as a team to assemble the team. In this way, HRM managers can get insight into employees' relations and characteristics, and get information about their motivation as a group. Such an insight can create or improve working conditions towards a more genuine result-oriented working environment that fits each individual. In this way, the HRM manager is more able to engineer teams according to the requirements of a specific work place or task within a company or an assignment (e.g. in public private partnerships of different scales) looking at the specifics of a current or future teams (e.g. in takeovers or downsizing). The value profiles give a manager instant insight into possible team combinations and whether old/current set up should be retained or used in another setting, and how useful merging the teams would be at the national or international level.

With regard to organisational learning, we can expect that value profiles can give HRM managers firsthand information about the collective strength of a group of individuals and how prone such groups are towards, for example, change or learning; this can directly concern selection, retention and dismissal, while being more sensitive to giving space for career growth and creativity. An HRM manager can save a lot of time and money by addressing a potential problem at the level of values. For example, if an HRM manager knows that a team has a lack of aptitude for learning as a group, it can save time and money before this becomes a problem. Or, in the case of strong individualism, an HRM manager can prevent an over-individualistic approach which could overshadow employees' competencies and innovativeness.

7. LIMITATIONS OF THE RESEARCH AND FUTURE COURSE OF RESEARCH

The approach presented here also has its limitations, which can be, however, addressed with a more elaborate selection of variables, i.e. values that are constituent elements of a certain desired outcome. For example, the approach presented here can be further used to identify the constituent elements of a fast learning team that quickly uses new information and methods. This implies the search for a combination of values and value profile combinations that can show an inclination towards learning and other values linked to learning, such as higher motivation for achievement, team work and recognition.

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DE GRUYTER OPEN

South East European Journal of Economics and Business
Volume 12 (2) 2017, 20-34
DOI: 10.1515/jeb-2017-0014

THE NATURE OF CORRUPTION AFFECTING ENTREPRENEURSHIP IN TRANSITION ECONOMIES: SOME LESSONS FROM MONTENEGRO

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Abstract

The aim of this paper is to examine how the institutional environment impacts the nature of corruption affecting entrepreneurship in transition economies. Drawing on a survey and in-depth interviews with entrepreneurs in Montenegro, the paper finds that corruption is a pervasive presence which has not been ameliorated despite economic reforms. Montenegro is a transition economy which has made significant strides in terms of creating a more open market economy. However, reforms have often overlooked corruption which remains prevalent, and the institutional environment has left space for officials and entrepreneurs to engage in corrupt practices. The paper shows that although it takes different forms, corruption can be viewed as a cultural impediment even if the majority of entrepreneurs are not exposed to it.

Keywords: *Corruption, Entrepreneurship, Institutions, Transition economies*

INTRODUCTION

Entrepreneurship is regarded as a catalyst of economic development in transition economies (Smallbone and Welter 2001; Puffer, McCarthy, and Boisot 2010). Yet corruption, which is often associated with transition economies, represents a significant challenge to moves towards open competitive markets (Manolova, Eunni, and Gyoshev 2008; Tonoyan et al. 2010; Estrin and Mickiewicz 2011; Imami 2012). Where institutions are weak, entrepreneurs can become exposed to and embroiled in corrupt practices (Xheneti, Smallbone, and Welter, 2012). As a result, corrupt practices can detract from more productive forms of entrepreneurial activity, and where corruption is deep-seated there are often wider economic and social ramifications. Although entrepreneurship is often portrayed as an individual endeavour, it is important to recognise that it both affects and is affected by the institutional environment which governs and directs economic activity (Acs, Desai, and Hessels, 2008; Bruton, Ahlstrom, and Obloj, 2008). As a corollary, institutional arrangements which create space for corrupt practices can stymie more productive forms of entrepreneurial activity,

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with wider ramifications for the economy and society (Chowdhury, Audretsch, and Belitski, 2015).

This paper finds that entrepreneurs in formerly centrally planned transition economies are frequently unable to operate beyond the realms of corruption. While this is the case in the larger transition economies of Eastern Europe (Vorley and Williams 2016), in the smaller, newly independent states corruption is common. Examining the nature of corruption affecting entrepreneurs in a transition economy, the paper demonstrates that part of what holds back entrepreneurship and its ability to contribute to economic development in these localities is partly the prevalence of corruption. While corruption is often seen as operating at the political or big business level (Round and Williams 2010), the paper highlights that corruption is faced by all entrepreneurs irrespective of the size of their ventures, and impacts at different points along their entrepreneurial journey, but has differential impacts on entrepreneurs according to the stage of their business activity (i.e. start-up or established, surviving or growing) and the size/value of their business. In starting a business, entrepreneurs are required to comply with numerous regulations, which exposes them to opportunistic petty corruption by low level bureaucrats. As their businesses grow, the nature of corruption is often more organised, involving kickbacks to political officials and/or extortion from more established 'tycoon' entrepreneurs. Some entrepreneurs use strategies to avoid corruption (Hudson et al. 2012), some accept it as a normal aspect of the culture, while others engage in it as perpetrators (Vorley and Williams 2016). As such, the central research question in this article is: "How does the institutional environment impact the nature of corruption affecting entrepreneurs in transition economies?" In answering this question, the paper finds that the institutional arrangements see corruption prevail, with entrepreneurs engaged and embroiled in corrupt practices whether by necessity or opportunity in different ways and at different stages of the business.

The empirical focus of the paper is Montenegro, a transition economy facing significant levels of corruption, which hinders productive entrepreneurship and is detrimental to economic development (Transparency International 2016; World Economic Forum 2016). Montenegro therefore provides an appropriate context for studying the nature of corruption affecting entrepreneurship. The paper highlights lessons from a transition economy but also to draw out implications for other countries seeking to develop more effective institutional frameworks which can reduce corruption and foster entrepreneurship. Our contribution is to show that in small transitioning economies such as Montenegro the institutional environment has not developed to the extent that it counteracts corruption. As such, perceptions of corruption are affected by negative experiences and the stories of others, even though most entrepreneurs do not experience corruption on a day-to-day basis. Given the size of the economy, corruption is often not linked to money, but rather nepotism. Where entrepreneurs engage in or are affected by corruption, it will most likely be through networks being used to speed up processes or by getting a preferential deal. Financial corruption only really affects large businesses with links to government, and the majority of entrepreneurs do not experience it.

The remainder of the article is structured as follows. Section 2 frames the study in terms of academic debates on corruption and entrepreneurship in transition economies. Section 3 introduces the institutional environment in Montenegro and sets out the methodological approach of the empirical project. Section 4 discusses the findings, highlighting the importance of informal institutions and networks, and how they represent an important aspect of the institutional landscape which affects entrepreneurial behaviours. Lastly, the article concludes by reflecting on the findings, and considers the wider implications for strengthening the institutional environment of Montenegro and other transition economies.

LITERATURE REVIEW

The institutional environment and corruption

Corruption is a multidimensional concept, the causes of which are diverse. It can be understood as a structural problem relating to political-economy, sociocultural issues or a combination thereof (Luo 2005; Transparency International 2016). The literature demonstrates that there are numerous causes of corruption, ranging from the impact of national wealth (Paldam 2002; Treisman 2000), the size of government (Montinola and Jackman 2002), income distribution and poverty (Paldam 2002), trade openness (Broadman and Recanatini 2000), inflation (Paldam, 2002), economic freedom (Goel and Nelson 2005), political stability (Treisman 2000), government regulations (Gerring and Thacker 2005), gender (Swamy et al. 2001) and an economy's competitiveness (Shleifer and Vishny 1993). These wide-ranging causes show that researchers have sought to categorise corruption in different ways to understand how it relates to other social, political and economic processes.

Moreover, the context in which entrepreneurship occurs is heterogeneous (Acs, O'Gorman, C., and

Szerb, 2007; Puffer, McCarthy, and Boisot 2010) and the institutional framework that prevails is fundamental to shaping entrepreneurial orientation, new venture creation, aspirations, perceptions and, ultimately, growth (Welter 2011; Doern and Goss 2014; Efendic, Mickiewicz, and Rebmann, 2015). Entrepreneurs are significantly affected by the institutional environment and, if institutions are weak, entrepreneurs can become exposed to and embroiled in corrupt practices (Basu, Estrin, and Svejnar, 2005; Xheneti, Smallbone, and Welter, 2012). As such, entrepreneurial activities can usefully be considered through the prism of the formal and informal institutions in which they occur. Institutions affect both individuals and organisations, and influence decision-making by signalling which choices, norms and behaviours are normalised and socialised within a society (Ahlstrom and Bruton 2002; Tonoyan et al. 2010). Consequently, institutions have an impact on the cultural perceptions which shape behaviour, and provide the 'rules of the game' within which individuals and organisations operate and compete (North 1990), affecting organisational behaviour by constraining and defining which actions are acceptable and supportable both within and between organisations (Tonoyan et al. 2010).

Formal institutions can be defined as the rules and regulations which are written down or formally accepted and give guidance to the economic and legal framework of a society. Informal institutions can be defined as traditions, customs, societal norms, culture and unwritten codes of conduct. These norms and values are passed from one generation to the next and can therefore be resistant to change (Bruton, Ahlstrom, and Obloj, 2008). Indeed, Estrin and Mickiewicz (2011) assert that changes in informal institutions may take a full generation. Research on entrepreneurship in transition economies has increasingly taken into account the nature of the institutional environment (Ahlstrom and Bruton 2002; Acs, Desai, and Hessels, 2008). Pejovich (1999, p.171) explains that, in transition economies, the incentives created by changes in formal rules often conflict with the prevalent informal rules, and therefore the interaction between formal and informal institutions will "reduce the production of wealth in the community". Moreover, formal and informal institutions are viewed to interact in two key ways, either by complementing or substituting each other (Welter and Smallbone 2011). Informal institutions are complementary if they create and strengthen incentives to comply with the formal rules, and thereby plug gaps in problems of social interaction and coordination, and enhance the efficiency of formal institutions (Baumol 1990; North 1990). Where informal institutions substitute formal institutions, individual incentives are structured in such a way that they are incompatible with formal ones, and exist in environments where formal institutions are weak or not enforced. For example, entrepreneurs draw on extensive networks that are governed by informal norms to circumvent formal and bureaucratic procedures, such as jumping of queues, arranging preferential agreements for loans or settling disputes (Ledeneva 1998; Bruton, Ahlstrom, and Obloj, 2008; Williams and Yang 2017). Whether entrepreneurs are assuming the role of bribe-payers or bribe-takers, the outcome sees corruption embedded in the institutional arrangements. This means that corruption can become a cost and act as a disincentive to (productive) entrepreneurship. Consequently, entrepreneurs often seek to develop contacts and social networks to mitigate the effects of corruption. However, this can potentially see them become embroiled with corruption as a beneficiary (Aidis, Estrin, and Mickiewicz, 2008). This can mean increasing the transaction costs associated with doing business unless they develop strategies to limit the negative effects of corruption (Anokhin and Schulze 2009). While the returns to entrepreneurship will be lower when corruption is higher, Estrin, Korosteleva, and Mickiewicz (2013) hypothesise that this varies according to the type of entrepreneur and enterprise. The disincentive effects of corrupt practices will be more pronounced for high-growth aspiration entrepreneurs, yet the impact on low-growth and subsistence entrepreneurship will be limited. As such, Welter and Smallbone (2011) assert small(er) enterprises are less likely to encounter corruption than larger firms, meaning that they often attract the attention of corrupt officials (Hunt and Laszlo 2012). However, even if larger businesses are more visible, they can be less adversely affected by corruption, as the gains can offset the costs (Anokhin and Schulze 2009).

Formal institutions and corruption

Extant research suggests that the institutions governing the economic environment in transition economies impose costly and bureaucratic burdens on entrepreneurs, which increase uncertainty as well as the operational and transaction costs of doing businesses (Aidis, Estrin, and Mickiewicz, 2008; Tonoyan et al. 2010; Puffer, McCarthy, and Boisot 2010; Budak and Rajh 2014). This is particularly evident with respect to financial institutions. Entrepreneurs in such settings can often be faced with incoherent and constantly changing business regulations (Manolova and Yan 2002; Aidis, Estrin, and Mickiewicz, 2008), meaning that, for example, they are unable to calculate their tax

bills due to changing tax codes (Tonoyan et al. 2010). In relation to accessing finance, Smallbone and Welter (2001) contend that banks tend to favour larger businesses and are generally less willing to finance small enterprises. Obtaining credit is a major constraint on entrepreneurial activity in emerging economies (Aidis, Estrin, and Mickiewicz, 2008), and as a result entrepreneurs and small firms often either have to resort to the informal credit markets or resort to bribing bureaucrats to secure the access to capital (Guseva 2007). Therefore, entrepreneurs in such economies look for opportunities whereby they can get around the constraints created by formal financial institutions.

A stable legal framework with well protected property rights also promotes planning and growth, as well as preventing the ad hoc expropriation of the fruits of entrepreneurship (Baumol 1990; Henrekson 2007). However, the experience of entrepreneurs in many emerging economies has been that the juridical system is incapable of adequately protecting property rights and of resolving business disputes (Manolova and Yan 2002). This is despite reforms being made whereby former Soviet countries have adopted written legal frameworks akin to those of more developed economies, including property, bankruptcy, contracts and taxation laws (Smallbone and Welter 2001; Aidis, Estrin, and Mickiewicz, 2008). However, these reforms have been ineffective in many cases, instead leading to inefficiencies and bureaucracy which means that going to court to settle a business dispute can be time consuming and costly (Luo and Junkunc 2008). In addition, there is a perception that the regulatory and legislative institutions are often themselves corrupt, which means that many entrepreneurs will avoid turning to the courts to settle disputes (Tonoyan et al. 2010). In such circumstances entrepreneurs often turn to informal networks to compensate for the failure of the legal system, for example by using connections to bend the rules or paying bribes that break them (Aidis and Adachi 2007). While entrepreneurs seek to mitigate the effects of corruption through their networks, this can go full circle and see them become embroiled with corruption as a beneficiary (Aidis, Estrin, and Mickiewicz, 2008). In such circumstances the prospect of engaging in illegal deals or corrupt activities will depend on the anticipated cost and probability of being punished (Becker 1968), and therefore entrepreneurs build the punitive costs into their pricing when planning a corrupt deal.

Informal institutions and corruption

With the fall of the Iron Curtain, countries in Eastern Europe and the former Soviet Union experienced dramatic changes in their political, economic and legal institutions. However, the informal norms and values which had been learned and adopted during the socialist years have continued to prevail. As a consequence, informal institutions have not complemented but rather have supplemented changes in the formal institutional environment (Guseva 2007). In environments with weak or uncertain formal institutions, entrepreneurs can lack trust and confidence in rules and regulations (Efendic, Pugh, and Adnett, 2011) and will be guided and governed by informal codes of conduct (Ahlstrom and Bruton 2002). Ledeneva (1998, p.213) finds that entrepreneurial behaviours in many emerging economies continue to be shaped by the rules inherited from the socialist period such as "what leads to success is always correct". Societies have therefore emerged in the former Soviet countries where informal institutions, i.e. the unwritten codes and social conventions, dominate the formal institutions. These informal institutions are often manifested at the individual level. Taken for granted behaviours are learned by living or growing up in a community or society, and are therefore specific to that culture (Scott 2007). This engenders a predictability of behaviour in social interactions, which are reinforced by a system of rewards and sanctions to ensure compliance. DiMaggio and Powell (1983) describe how this sees informal norms established over time.

The social norms and perceptions of behaviour associated with these informal institutions are important determinants of whether corrupt practices are accepted or not (Budak and Rajh 2014). For entrepreneurs, the likelihood of becoming embroiled in corruption is affected by the perception of how many other individuals in the society are engaged in corrupt arrangements (Andvig and Moene 1990). If corruption is rife or perceived as a norm, the expectation will be that the 'moral costs' are low in terms of social sanctions. Indeed, Rose-Ackerman (2001) suggests individuals in the post-Soviet transition states often justify their own corrupt behaviour by the pervasive nature of corruption in their own lives. As such, Tonoyan et al. (2010) posit that corruption may be rationalised for to two reasons: first, entrepreneurs who share the view that the "good" ends justify the means may be more willing to engage in corruption, with the "good" ends referring to economically better outcomes (e.g. receiving a public contract, saving on taxes, getting a license), which may be achieved via "dirty" means (e.g. bribing bureaucrats/public officials); and second, the probability of corruption being high in countries where the majority diverges from legal norms.

Institutional interplay and corruption

It is clear that both the formal and informal institutions present within a country can see corruption normalised, as corrupt behaviours spread and intensify to a point where it is expected and accepted although not necessarily morally approved (Spicer 2009). Indeed, it is the interplay between formal and informal institutions which allows corruption to persist (Vorley and Williams, 2016). The process by which corruption is normalised is described by Ashforth and Anand (2003) in three steps: institutionalisation, rationalisation and socialisation, and is equally applicable to corruption in the public and private sector. In the case of emerging post-socialist economies, a longstanding culture of misusing public power for private gain has existed, which has been appropriated into the private sector during transition. In this way, corruption has become normalised as a rule of the game, being embedded further as corrupt behaviours and practices are perpetuated through social structures and ideologies. Consequently, corruption is often not regarded as a deviant practice, but rather becomes accepted as a fact of life. This, in turn, impacts on entrepreneurs, some of whom accept corruption and act strategically to use it to their advantage, while others who may seek to avoid corruption inadvertently become subject to it as a result of paying bribes or incurring the non-monetary cost of not paying bribes.

The challenges associated with institutional development are common, albeit to differing degrees across transition economies (Efendic, Pugh, and Adnett, 2011; Krasniqi and Mustafa 2016). As Cowen and Coyne (2005) state, developing effective institutions is particularly difficult in post-war environments when concurrent with wider societal reconstruction. Building effective institutions and coordinating public policy in transition economies poses a very real challenge to realising a path towards economic growth and development. The remainder of the paper examines institutional reform and its impacts on corruption and entrepreneurship in Montenegro as a transition economy. Our paper finds that, despite some progress being made in strengthening its formal institutions, reforms have not adequately tackled corruption, which remains an everyday part of an entrepreneur's life. In fact, corruption is normalised, with many people not seeing illegal activities as 'corrupt' per se.

EMPIRICAL FOCUS AND METHOD

The empirical focus is the institutional environment in Montenegro, a small upper middle-income country in South Eastern Europe. Formerly part of the Federal Republic of Yugoslavia, Montenegro is a relatively new transition economy having declared its independence from Serbia in 2006 (Andelic, Cosic, and Dakovic, 2010). In progressing towards a more open market economy, Montenegro faces many challenges such as corruption generated by the misalignment between formal and informal institutions known as institutional asymmetry (Williams and Vorley 2015), institutional vacuums filled by informal practices or "corrupt efforts" that influence the formation of laws, rules and regulations (Hellman and Kaufmann 2001, p.2), which hinder productive entrepreneurship.

Previous research on Montenegro and similar transition economies from South Eastern Europe has identified various barriers to entrepreneurship amongst which financial and fiscal burdens, human resource barriers caused by ineffective employment regulation, and an underdeveloped entrepreneurship culture are some of the most common (Pinto 2005; Bobera, Lekovic, and Berber, 2014). Perceived opportunities for start-up, fear of failure, and social support for entrepreneurial activities are also suffering due to deteriorating business conditions, and institutional barriers continue to stymie productive entrepreneurship. Moreover, there are significant challenges to developing effective entrepreneurship policies, such as resource scarcity, institutional turbulence, ineffective institutional cooperation and coordination, informal economic activities, complicated tax systems, access to finance by SMEs, and inadequate business support programmes (Pinto 2005; Williams, Franic, and Dzhekova, 2015). Indeed, the European Commission (2014) identifies the regulatory and legal environment, contract enforcement, administrative costs and barriers, and privatisation procedures as areas where further improvement is required.

Montenegro became an EU candidate country in 2010 and started accession negotiations in 2012, part of which involves a commitment to tackling corruption (European Commission 2014). In Montenegro corruption was widespread even before independence. Montenegro witnessed what Hellman and Kaufmann (2001) refer to as 'state capture', whereby private interests exert influence on public officials through bribes and kickbacks to shape state laws, policies, and regulations to their own advantage. State capture thus occurs when the boundaries between private and political interests are blurred, undermining and sometimes replacing "legitimate and transparent channels of political influence and interest intermediation" (World Bank 2000, p.3). Montenegro experienced state capture through a combination of economic and political transition, whereby private interests used power vacuums to shape the new rules of the game, international

sanctions, privatisations and a general lack of transparency and effective control mechanisms (Uzelac 2003). The privatisation process in Montenegro led to value destruction and was detrimental to productive entrepreneurship as managers and politically connected individuals took advantage of weak institutions and liquidated more productive firms as well as smaller firms through asset stripping (Koman et al. 2015). Therefore, the seed of corruption started to germinate long before Montenegro's independence, and continues to hinder institutional reforms and the transition to a market economy.

The Corruption Perceptions Index classifies Montenegro as one of the most corrupt states in Europe, ranking 64th out of 176 countries, significantly higher, however, than its neighbour Albania (Transparency International 2016). The World Economic Forum (2016) places Montenegro on the 82nd place out of 138 global economies in terms of overall competitiveness, twelve places lower compared to the previous year, with corruption being in the top five most problematic factors for doing business. Moreover, the institutional environment ranks lower in areas such as organised crime, judicial independence, property rights, and business costs of crimes and violence. Requiring only 6 procedures and taking just over one week to start a business, Montenegro ranks 51st of the 190 countries surveyed by the World Bank (2017) in terms of the ease of doing business, significantly higher than Albania, and made significant improvements in enforcing contracts and trading across borders. However, although improvements have been made, the country still ranks lower in dealing with construction permits, paying taxes, and registering property, areas which can give rise to corrupt practices to reduce the burden or to speed up processes. Ranking 83rd out of 180 global economies in the 2017 Index of Economic Freedom, Montenegro continues to face high levels of corruption which remains pervasive (Heritage Foundation 2017). Thus although Montenegro has made some progress towards aligning its institutions with the European Union (EU) requirements, the European Commission (2014, p.2) concludes that "[t]he impact of anti-corruption measures has so far been limited", and that "corruption remains prevalent in many areas and continues to be a serious problem" (European Commission 2016, p.4). Therefore, Montenegro must continue to strengthen its formal institutions while tackling corruption and creating an institutional framework that fosters more productive entrepreneurship.

As outlined above, the aim of this paper is to examine how the institutional environment impacts the nature of corruption affecting entrepreneurship in transition economies. To do this we utilise a survey of 311 entrepreneurs and 15 in-depth interviews with entrepreneurs across Montenegro. A database of contacts was drawn from the Central Register of the Economic Subjects in Podgorica, and from this 311 businesses from 11 different Montenegrin municipalities took part in interviews. The sample contains a range of demographic characteristics, company activities and size. Interviews were conducted with Directors, owners or authorised company representatives. Face-to-face interviews were carried out with each of the respondents, with the questionnaires lasting 30 minutes on average. The survey was conducted in 2009, three years after Montenegro became an independent state. Table 1 sets out the profile of the survey respondents.

In order to gain further insight into entrepreneurship and corruption in Montenegeo, in-depth interviews were carried out with a further 15 businesses, all of whom were based in the capital city of Podgorica. In emerging economies qualitative research has the potential to improve understanding of entrepreneurs' experiences, as well as provide rich data (Doern 2009).

Table 1: Profile of survey respondents

	N	%
Regions		
Podgorica	87	28
Nikšić	36	11
CENTER	**123**	**39**
Bijelo Polje	25	8
Pljevlja	20	6
Berane	18	5
Rožaje	15	4
NORTH	**78**	**25**
Bar	23	7.4
Herceg Novi	21	6.8
Kotor	15	4.8
Ulcinj	21	6.8
Budva	30	9.6
SOUTH	**110**	**35**
TOTAL	**311**	**100**
Year of establishment		
Before 1996	52	18
1997-2000	60	21
2001-2003	60	21
2003-2005	50	17
2006-2009	67	23
TOTAL	289	100

Table 1: *Continued*

	N	%
Number of employees		
1-2	72	23
3-4	52	17
5-9	63	21
10-16	58	19
17-100	57	19
100 +	4	1
TOTAL	306	100
Ownership		
Domestic capital	294	95
Foreign capital	10	3
Mixed capital	6	2
TOTAL	310	100
Main activity		
Agriculture, forestry and water supply	4	1.3
Hunting and fishing	2	0.6
Processing industry	15	4.9
Construction	11	3.6
Wholesale	117	38.0
Retail	21	6.8
Hotels and restaurants	27	8.8
Transportation	17	5.5
Financial intermediation	9	2.9
Real estate and consulting	5	1.6
Crafts	50	16.2
Other (education, health services, etc)	30	9.7
TOTAL	308	100
Annual turnover		
< €50,000	118	45
€50,000 – €100,000	47	18
€100,000 – €200,000	23	9
€200,000 – €400,000	22	8
€400,000 – €600,000	15	6
€600,000 – €800,000	10	4
€800,000 – €1,000,000	7	3
> €1,000,000	22	8
TOTAL	264	100*

* 101 due to rounding

As the full extent of corruption cannot be accurately measured (Budak and Rajh 2014), a mixed approach using surveys and qualitative interviews provides the opportunity to explore entrepreneurs' experiences and perceptions in great depth. While the small number of entrepreneurs limits generalisability, the value of the approach is in generating theoretical and policy implications for further research (Jack and Anderson 2002). The qualitative interviews were not intended to be representative of entrepreneurs in Podgorica or Montenegro, but rather to explore perceptions and experiences so that in-depth insights into their experiences of corruption could be gained. Potential participants were initially contacted via the Montenegro Chamber of Commerce, and then a snowball sampling technique was applied. Snowball sampling is a method particularly useful for undertaking research on sensitive topics and accessing 'hidden' populations and more suitable for small sample sizes (Hendricks and Blanken, 1992; Ram, Theodorakopoulos, and Jones, 2008). Table 2 profiles the participants in terms of their sector, size and age of their business. Interviews lasted 1 hour on average and were conducted in October 2014. Although the in-depth interviews were conducted five years after the survey, they add depth and voice to the study and offer a recent account of the level of corruption in Montenegro, allowing us to examine how the institutional environment has changed from post-independence in 2009 to the present context. The two data collection stages bridge two significant periods in Montenegro's evolution, i.e. the period when the state was still in its infancy and the period after the state committed to tackling corruption subsequent to starting EU accession negotiations in 2012. Therefore, the data enabled an evaluation of the prevailing level and perceptions of corruption in Montenegro and an assessment of the success achieved in mitigating corrupt activities.

The interviews were semi-structured which meant that a number of issues not on the interview schedule were raised by some respondents which were relevant and were subsequently explored further. The interviews were recorded with the respondent's consent. They were then transcribed, before a grounded approach was taken towards thematically analysing and coding the data to explore emergent themes. During the interviews, the entrepreneurs were asked to reflect on their business development, growth aspirations, and experiences/perceptions of corruption. As Doern and Goss (2013) state, one limitation of such an approach is the risk of fundamental attribution error, in that respondents might offer accounts of past actions or future intentions in terms that protect their self-image as entrepreneurs rather than recounting actual events, for example attributing barriers/challenges to the actions of others rather than to their own shortcomings. However, although such biases

Table 2: Profile of in-depth interview respondents

Respondent	Sector	Size of business (number of employees)	Age of business
INT1	Food and drink	11-50	6-10 years
INT2	Electronics	1-10	6-10 years
INT3	Food and drink	1-10	1-5 years
INT4	Media	11-50	6-10 years
INT5	Pharmaceutical	1-10	1-5 years
INT6	Food and drink	11-50	6-10 years
INT7	Electronics	11-50	1-5 years
INT8	Food and drink	1-10	Less than a year
INT9	Construction	11-50	6-10 years
INT10	Construction	51-250	10+ years
INT11	Financial services	1-10	Less than a year
INT12	Media	11-50	6-10 years
INT13	Retail	1-10	1-5 years
INT14	IT	1-10	1-5 years
INT15	Tourism	1-10	1-5 years

Table 3: Level and perceptions of corruption

	N (out of 311)	%
Level of corruption present		
Very present	67	22
Present	70	23
Somewhat present	90	29
Not present	58	19
Not present at all	26	8
Most corrupt institutions		
Market inspection	138	45
Customs administration	135	43
Least corrupt institutions		
Tax administration	39	13
Commercial Court	35	11
Reasons for corruption		
Lack of professionalism/incompetence	86	28
Complexity of procedures	51	16
High cost of services	43	14
Overwork	25	8
Lack of transparency	14	5
Don't know/no answer	37	12
Other (e.g. low salaries, economic crisis)	55	17
Frequency of corrupt payments among those who have had personal experience		
Paid a bribe/gift in past 12 months	68	22
Expected to pay a bribe/gift in next 12 months	112	36

cannot be ruled out completely, as the interviews allowed the respondents to recount their experiences in depth and for the interviewer to probe responses, a wholly artificial story would be very difficult to sustain. In carrying out qualitative research it is important that the reliability of coding is consistent and structured in order to prevent coder bias (Bryman 2012). As such, the coding process was conducted independently by the authors, with overarching thematic categories identified. Through this, a coding scheme was developed based on the key themes so that intra-coder reliability could be consistent. This coding scheme was then applied by all authors independently, with the results compared to ensure inter-coder reliability by identifying any discrepancies between the coders so that they could be revisited and then agreed. Such a constant comparative method involves continually identifying emergent themes against the interview data, and employing analytic induction so that the researcher can identify the nature of a relationship and develop a narrative (Silverman 2000; Bryman 2012). The qualitative approach enabled entrepreneurs to articulate how they perceive the interplay between institutions, corruption and their own entrepreneurial activity. Quotes from the interviews are used to add voice to the study.

FINDINGS

The remainder of the article presents the findings and analyses the experiences and perceptions of corruption of Montenegrin entrepreneurs. This section is divided into the following sub-sections: institutions as catalysts of corruption, highlighting how weak institutions create incentives to engage in corrupt practices; and the nature of corruption, from prevalent small bribes to large-scale corruption.

Institutions as catalysts of corruption

The survey uncovered the level of corruption that permeates formal and informal institutions in Montenegro. Survey respondents were asked a range of questions related to their perceptions of levels and types of corruption which impact on their entrepreneurial activities (Table 3). When asked to assess the level of corruption, 45% believed that corruption is present or very present.

Entrepreneurs' responses highlight formal institutions as catalysts of corruption. The respondents who rated corruption as present or very present cited customs administration (43% stating it was present or very present) and market inspection (45% stating it was present or very present) as the most common areas of corruption. In identifying the reasons why these two institutions were characterised as the most corrupt, the problem of non-professionalism and/or incompetence of officials were recognised as a key issue (Table 3). Within this, corruption of individual staff is a key issue, as noted by the in-depth interviews. Highlighting the extent to which corruption permeates formal institutions, one respondent stated that: "People expect a bribe or favour. If you want something done, you need to comply" (INT3). At the same time, although the corruption of officials is a key issue, the high cost of services and the complexity of procedures, namely in the case of market inspection, along with a lack of transparency in the work of 'customs administration' are significant problems. Complexity is a key problem in transition economies where rules change quickly. In Montenegro's case complexity is further increased by the EU accession process whereby Montenegro needs to align its formal institutions to EU standards, and therefore the institutional landscape is constantly changing. One respondent stated: "There are new rules all of the time. It is hard to keep up with what you are supposed to adhere to" (INT6), while another stated that due to complexity he does not know whether he follows "all the rules … I hope I do but maybe one day I will get a knock on my door to tell that I don't" (INT8).

Moreover, respondents also mentioned additional reasons for corruption, other than those put forward in the questionnaire as possible answers. The most frequently stated reasons were that officials are in a position to take bribes (24%), that fact that officers have low salaries (20.7%), and also that personal benefit is more important to them and comes before fairness when considering work performance (21%). Many of the in-depth interview respondents stated that such activity leads to nepotism, with friends and family favoured over others. For example, one entrepreneur stated that "If you know someone in the office, then you get your paperwork through quickly. But if you don't it will be much slower" (INT10). Such perceptions mean that the entrepreneurs often perceived the system to be inherently 'unfair', with access to power and influence beneficial for some, but creating barriers to others: "Sometimes you can feel cut off if you don't have any contacts in the customs office or the tax office … the progress of your business can be really slowed down by not having anyone to help" (INT12). These findings reveal that petty corruption is often linked to nepotism rather than money.

Furthermore, when asked to assess their level of trust in the institutions with which they cooperate, the largest percentage of respondents stated that they have the highest level of trust in Tax Administration (13%) and the Commercial Court (11%). Taking into account that the estimated level of corruption in the two aforementioned institutions/services was the lowest, it is possible to conclude that enterprise representatives tend to indicate more confidence in the system institutions in which corruption is estimated at the lowest level.

Respondents were also asked to score the level of corruption in public services on a scale of 1-5 (where 1 is 'not present at all' and 5 is 'extremely present'), and based on their responses (Table 4) the most corrupt processes and services are Issuing of Construction Permits (3.2), Urbanization and Construction Inspections (3.1). Customs Administration and Spatial Planning were given a medium level mark of 2.9. The responses are supported by data from the World Bank (2017) which ranks Montenegro 93rd of 189 countries in terms of dealing with construction permits, with 8 procedures and 152 days required to obtain a permit. However, the World Bank (2017) reports that trading across borders is reported as fairly efficient in Montenegro, which contrasts the level of corruption reported by Montenegrin entrepreneurs in the Customs Administration department. Nevertheless, this discrepancy signals an improvement in this area between 2009 - the time the survey was conducted - and 2015 - the recent international ranking. On the other hand, company representatives believed that corruption is least present in the Commercial Court (2.2). When comparing the results by region, the level of corruption present in the process of obtaining concessions is rated much lower in the central region (1.8) than it is in the northern (3.3) and southern (2.8) regions. Though the least developed, the northern region faces a corruption level above the national average and above the score achieved by the other two regions, as perceived by the entrepreneurs. Since no large transactions are taking place in the least developed region, this emphasises that corruption in Montenegro is linked to nepotism rather than money.

Therefore weak formal institutions and perceptions of corruption give rise to opportunities to engage in corrupt practices which become a norm of doing business, benefiting those with resources and access to power while constraining the others. However, there are two sides to the story and the interviews highlight that the prevalence of corruption cannot be entirely attributed to weak formal institutions.

Table 4: Average rating regarding the level of corruption in the following public service

	Montenegro	Center	North	South
Customs Administration	2.9	3.0	3.1	2.9
Directorate for Public Procurement	2.6	2.3	2.6	2.8
Tax Administration	2.4	2.5	2.2	2.5
Issuance of Construction Permits	3.2	3.3	3.1	3.2
Urbanism	3.1	2.9	2.9	3.3
Spatial Planning	2.9	2.8	2.9	3.1
Issuing Working Permits	2.5	2.7	**3.1**	2.2
Construction Inspection	3.1	3.1	2.8	3.3
Market Inspection	2.8	**3.5**	2.2	2.5
Communal Police	2.5	2.5	2.7	2.4
Labour Inspection	2.4	2.7	2.2	2.2
Sanitary Inspection	2.4	2.5	2.1	2.5
Tax Inspection	2.4	2.6	2.2	2.4
Obtaining Concessions	2.8	**1.8**	3.3	2.8
Judicial Authorities	2.6	2.7	2.4	2.6
Commercial Court	2.2	2.3	1.8	2.4

Corruption instead is the results of a system that creates incentives for both poorly paid officers seeking personal benefits and for entrepreneurs constrained by complexity, high cost of services and the lack of transparency to engage in corrupt practices. As such, corruption becomes both expected and accepted, as highlighted in the following sub-section.

The nature of corruption

Small-scale bribery. Respondents were asked three different questions related to corruption to test their honesty and propensity to engage in corrupt practices, i.e. whether they offered a bribe in the past 12 months, whether they have been in a situation where a bribe was expected from them, and what they would do if they are asked to offer a bribe. While the perception that corruption was widespread was common among the respondents, the majority of companies who took part in the survey (88%) stated that they did not give presents/bribes to officers within the past 12 months; 6% of respondents indicated that they rarely offered bribes, while 4% indicated that they had often offered bribes to competent authorities over the past 12 months. Moreover, when asked whether a bribe was expected from them in return for some service, 18% confirmed, out of which 21% offered a bribe, 41% said they did not offer a bribe, and a significant group - 38% - refused to answer (Table 5). Of the total number of companies that had given bribes, six companies stated that they had given bribes to customs officers and to market inspection officers. The highest value of a bribe offered to a customs officer was €300, whilst the highest amount that a market inspection officer was offered was €500. The main benefit of bribery, according to the survey respondents, is the speeding up of procedures, followed by the avoidance of responsibility in terms of non-compliance with rules as well as the reduction of outstanding liabilities (Table 5). The fact that market inspection was reported to be one of the most corrupt institutions by almost half of the respondents shows not only the level of corruption to which the institution is subject but also the participation of entrepreneurs in corrupt practices, who take advantage of officers' low salaries and offer them small bribes in order to avoid penalties. Thus petty corruption is both expected and accepted. The problems solved by offering bribes emphasise some of the issues encountered by entrepreneurs when having to deal with formal institutions, and the relatively low value of bribes demonstrates that the majority of bribes paid are small-scale. Similarly, the in-depth interviews found that small-scale bribery was prevalent, with only one respondent stating that they paid a bribe of over €1000. To many of the in-depth respondents, paying small-scale bribes was a necessary aspect of ensuring that paperwork, particularly relating to licenses, was approved. One respondent stated that "sometimes you have to pay a bribe, but it won't affect you much. It will only be a few hundred Euros in order to get things processed on time" (INT15), while

Table 5: Frequency and benefits of paying bribes

Frequency of opportunities to give a bribe among those who gave a bribe	%
1-2 times	50
3-5 times	29
5-10 times	9
More than 10 times	12
Actions of companies where bribes/corruption were expected	
Offered a gift/bribe	21
Did not offer a gift/bribe	41
Don't want to answer	38
Response of companies if bribe/corruption would be expected	
Would refuse to offer a bribe	41
Would give a bribe	21
Don't know/Undecided	38
Act of payment/bribery initiators	
Officers who are in direct contact with parties	47
Higher officers in institution/departments	11
Parties (management or employees in the companies)	36
Someone else	6
Benefits of paying bribes	
Faster processing of procedures	32
Avoiding responsibility (misdemeanour, criminal, etc.)	27
Decreasing due obligations (taxes, duties, fees, etc.)	16
Lower tariffs/ payment of required services	8
There was no other alternative way	8
Obtaining services for which the company does not meet conditions	5
Other reasons	4

another said "you don't really think about because the amounts are small. If I pay €100 to get a license sorted I don't really worry about it … it is not right but it does not act as a major barrier" (INT12). In this sense, the formal institutions are permeated with informal practices in that corrupt practices are expected and accepted (Spicer 2009). As Tonoyan et al. (2010) state, if the perception is that corruption is rife, the expectation will be that the 'moral costs' are low in terms of being socially sanctioned. Corruption through bribes thus takes the form of accepted insurance payments to ensure that formal institutions do not constrain entrepreneurial activity. Many of the respondents accepted the fact that bribes needed to be paid and were not concerned by them due to the relatively small amounts involved. Perhaps the small value of bribes is in itself part of the reason why bribery became a prevalent and accepted practice, influencing perceptions to the extent where the benefits gained from participating in the process outweighed the monetary and moral costs. One of the surveys showed that around one out of eight (12 per cent) bribes paid serve no specific immediate purpose for the businesses paying them, suggesting that these are "sweeteners" given to public officials to "groom" them for future interactions in the interest of the company.

Large-scale bribery. At the same time, the in-depth respondents stated that large-scale bribery did take place but that, as one respondent said, "it is not part of our world" (INT3). Large-scale bribes were seen to be related to large, sometimes multinational companies that benefit from close contacts with public officials. As reported by the US Department of State (2016) in the most recent report on Human Rights Practices in Montenegro, though regulation provides criminal penalties for corruption by officials, the law remains implemented ineffectively, and corruption remains the problem. As stated in the report "politicization, poor salaries, and lack of motivation and training of public servants provided fertile ground for corruption" (p.18). During 2016, several cases of "high level corruption" have been processed and investigated, showing strong connection between politicians and businesses. Despite not involving small entrepreneurs, such cases cause lack of trust in institutions and impact entrepreneurial behaviour by preventing new investments and job creation.

The waves of privatisation in Montenegro led to the exit of numerous productive and small enterprises (Koman et al. 2015) and blurred the lines

between state official's public and private interests (Uzelac 2003). At the same time, it created a mechanism whereby new or privatised companies with direct links with the government were able to gain unfair market advantages. This in turn created a system whereby large companies can control their markets by using formal institutions to undermine the activities of their competitors or even eliminate them from the market. The World Economic Forum (2016) shows that, in terms of goods market efficiency, Montenegro ranks significantly lower on intensity of local competition, and lower on extent of market dominance and effectiveness of anti-monopoly policy. It is possible that important players use market inspection to keep smaller players under control, limiting their activities and creating a system where only those who comply with corruption can continue to operate. The in-depth interviewees stated that large players could act to prevent smaller businesses growing to large, mainly by utilising their contacts with government. This meant that smaller businesses were crowded out from public procurement contracts. For example, when publishing public tenders, conditions are set up to simply eliminate small companies by introducing technical specifications which can be met only by certain bidders or by providing unrealistic prices which are much lower compared to the ones on the market (MEF, 2016). As one respondent stated, "we can't hope to compete for public contracts, we have given up on that. A larger business that is prepared to pay larger bribes or use their contacts will always win" (INT4). As shown in Table 5, both officers (47%) and companies (36%) are frequent bribery initiators and therefore it is rather clear that corruption is based on a mutual understanding between public authorities and private interests, creating non-transparent channels of influence whereby only those who can afford the price and have political connections can succeed.

CONCLUSION

This article has examined the nature of corruption affecting entrepreneurship in Montenegro, a transitional economy with an emerging institutional environment. The study contributes to a better understanding of institutional development in countries which are aiming to transition towards a more open market economy and of how legacies of corruption permeate formal and informal institutions stymie productive entrepreneurial activity. We show that regardless of whether entrepreneurs try to act strategically to take advantage of corrupt opportunities or endeavour to avoid corrupt activities, the interplay between formal and informal institutions means that corruption is embedded. As such, entrepreneurs almost inevitably become subject to the corrupt practices of others. Some accept it as a normal aspect of the culture, while others engage in it as perpetrators. Corruption is facilitated by complicated procedures and weak informal institutions which act as catalysts of corrupt activities, creating incentives for both officials and entrepreneurs to engage in corrupt practices. The nature of corruption in Montenegro affects all entrepreneurs, irrespective of the size of their ventures, and corrupt practices range from small-scale almost incidental bribery and nepotism to large-scale activities.

Often corruption involves small bribes which are not perceived as a problem by entrepreneurs, but rather as an accepted part of doing business. In this way, petty corruption acts as an insurance payment compensating for institutional failure, as bribes can ensure that entrepreneurial activity is not directly constrained by institutional inefficiencies. Petty corruption is often liked to nepotism rather than money, and entrepreneurs can turn to informal networks to circumvent or speed up complex bureaucratic procedures and to obtain preferential deals (Williams and Yang 2017). Large-scale financial corruption mostly affects large businesses with links to the government and involves public contracts for which small businesses usually cannot compete. Moreover, even though most entrepreneurs do not experience corruption on a day-to-day basis, perceptions of corruption perpetuate corrupt practices and hinder the convergence of formal and informal institutions. In addition, corruption prevents safe and rational investment, both foreign and domestic; it slows down and hinders development and limits trade, leads to irrational and wasteful use of public funds, encourages the "gray" economy, and reduces tax sources (Vorley and Williams 2016).

Transitioning from a formerly centrally planned economy and only experiencing independence for the past decade, Montenegro's institutional framework remains underdeveloped. Montenegro's independence, albeit an important step towards a more open market economy, was used as an opportunity by private interests to influence the development of institutions to shape the 'rules of the game' to their own advantage. Moreover, the waves of privatisation blurred the lines between private and public interests, creating unfair, non-transparent channels of access to power and influence. Therefore legacies of corruption continue to hinder entrepreneurship in Montenegro and its ability to contribute to economic development, and to permeate formal and informal institutions, maintaining perceptions of corruption and perpetuating

corrupt practices which became accepted as a norm of doing business. Our paper finds that, despite some progress being made in strengthening its formal institutions and improving its legislative framework, reforms have not adequately tackled corruption, which remains prevalent. This is confirmed by the majority of Montenegrin entrepreneurs who are either convinced that the fight against corruption has been unsuccessful or are unsure about its effects.

Given the prevalence of corruption in Montenegro, strengthening formal institutions, changing perceptions of corruption, and achieving congruence between formal and informal institutions is undoubtedly a long-term process. Despite further progress being expected as part of its accession negotiations, perceptions of corruption are likely to persist unless Montenegro achieves a credible track record of fighting against corruption. Understanding how Montenegro and other transition economies can break free from legacies of corruption to harness entrepreneurship as a catalyst of economic development represents a fruitful avenue for future research.

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South East European Journal of Economics and Business
Volume 12 (2) 2017, 35-46
DOI: 10.1515/jeb-2017-0016

THE PROBABILITY OF RETURN CONDITIONAL ON MIGRATION DURATION: EVIDENCE FROM KOSOVO

Mrika Kotorri

Abstract

The aim of this paper is to conceptualise the migration duration decision within the expected utility maximisation framework, and from that to derive and estimate an empirical proposition. For this purpose, the conceptual framework in Kotorri (2015) is extended where households decide to return to the home country conditional on their migration duration. In the empirical analysis, the Cox proportional hazards model is employed. This analysis is the first to investigate migration duration based on a random sample stemming from the Kosovo census of population conducted in 2011. The findings suggest rather mixed support for the household approach. The hazard to return decreases with income but not nonlinearly. The results indicate that household return migration behaviour is influenced by demographic characteristics, psychic income, and political factors.

Keywords: *Return, Migration, Duration, Survival Analysis*

JEL Classification: *J60, D1, O15*

INTRODUCTION

Kosovo has a long migration experience, which has passed through three waves, and a large number of its population lives abroad. According to the latest census of the migrant population undertaken by the Ministry of Diaspora, around 400,000 Kosovans live abroad. The motivation of this analysis is that due to the large share of the Kosovan population living abroad, the characteristics of migrant households that return are important from the perspective of Kosovo's future economic development. This renders the analysis of whether the probability of return is higher among the more or the less educated valuable to find out whether Kosovo is benefiting from Brain Gain. If the poor and elderly are more likely to return, this will increase the future burden on the currently weak welfare system in Kosovo. Usually, returnees transfer savings and know-how through business investments fostering economic growth at home. So, the demographic and economic characteristics of returnees are also worth investigating.

In the return migration literature, Dustmann (2002) and Dustmann and Weiss (2007) recognise that both temporary and circular migration occurred, irrespective of persisting wage differentials. Azzari and Carletto (2009) argue that analysing the migration process by ignoring its dynamic and repetitive nature

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may be limited and misleading. Accordingly, studies adjust the theoretical framework and model migration as a dynamic process within an optimal lifecycle framework.

Given the above, the aim of this paper is to extend the theoretical framework deployed in Kotorri (2015) to investigate the determinants of the optimal migration duration among Kosovan migrant households. Hence, migration is modelled as a dynamic household decision. This phenomenon has been recognised by a rather low number of migration studies.

This paper contributes to knowledge in several respects. It slightly extends the conceptual framework developed in Kotorri (2015) adding the effects of business ownership and house ownership. These two are hypothesised to capture aspects of psychic income different from those controlled for by existing variables. Second, it is the first to test the applicability of the household perspective and employ the Cox proportional hazards model in investigating migration duration among Kosovan households based on a sample derived from the latest Kosovo census. Third, given this, it contributes to knowledge by providing policy implications of return migration based on more accurate results compared to those in Kotorri (2015), as the survey of that analysis was based on the 2004 Voters Official Registry.

LITERATURE REVIEW

This literature review focuses exclusively on theoretical models developed in the migration literature ignoring empirical results, for brevity. Following differences in the theoretical approaches are considered.

Early studies, modelled emigration and return as one decision within the optimal lifecycle approach focussing exclusively on its determinants (Borjas and Bratsberg 1996; Kotorri 2010; Efendic 2016). One of the limitations of this framework is that it ignores the relevance of time. Time is rendered important in influencing the return decision, if the emigration reason is related to a savings target. Due to differences in employment and earnings abilities, some migrants may never manage to reach their savings target and hence not return. So, differences in migration and remigration costs over time among migrants, and differences in returns conditional on migration duration are relevant too. But it is impossible to integrate migration duration within this model as it assumes constant migration and remigration costs and constant returns to migration spells among migrants. Several studies analyse the return decision ignoring the importance of duration (Waldorf 1995; de Coulon and Piracha 2005; de Coulon and Wolff 2006; Sander 2007; Kotorri et al. 2013).

To fill this gap, some studies amend the conceptual approach to consider the relevance of time. These studies conceptualise the return decision in terms of migration duration, rather than the probability of return (Djajic and Milbourne 1988; Dustmann 2002; Carrion-Flores 2006; Dustmann and Weiss 2007; Gundel and Peters 2008; Azzari and Carletto 2009; Gaule 2011). The first three studies provide a conceptual analysis in addition to the empirical investigation of the determinants of migration duration. For illustration the theoretical approach in Dustmann (2002) is discussed below. Carrion-Flores (2006) elaborates a conceptual framework identical to that in Dustmann (2002), but does not make reference to it.

Employing the individual perspective, Dustmann (2002) models the return decision by weighting the benefits of staying an additional time unit against the costs of it. This is then maximised given a budget constraint. Here, the migration duration is maximised conditional on wage differentials, consumption preferences, relative price of consuming in the host country and cost of migration. The relationship between the wage deferential and migration duration is assumed to be ambiguous. Due to the relative wage effect, an increase in the wage differential positively impacts on the marginal benefit of staying abroad leading to longer migration duration. Yet, the income effect works in opposite direction. As wage differentials increase the lifetime wealth, given diminishing marginal utility from wealth, migrants have a lower incentive to stay abroad for another period. Because of this ambiguity, wage cannot be considered the only determinant of migration duration rendering other factors important. The author hypothesises that the preference for consumption at home and the purchasing power of the host country currency at home are relatively higher. Thus, irrespective of better economic conditions abroad, migrants may return due to the greater utility from consumption at home. Migrants benefit from longer migration duration because of the assumed positive wage differential in favour of the host country, and/or preferences and favourable relative prices. Hence, migration duration is considered to have a positive impact on migrants' lifetime wealth. Migration costs include the forgone utility from consumption at home. Given the hypothesis on the relatively higher preference for consumption at home or the hypothesis on the relatively higher purchasing power of the host country currency at home, or both, migration costs are positive and increase with migration duration. Consequently, the migration duration is optimal when the expected total benefits equal the

total costs of staying one extra time unit. Unlike Borjas and Bratsberg (1996) they introduce heterogeneous migration costs among migrants. Arguing that return migration may be a result of the return to the human capital acquired/accumulated in the host country being higher at home, Dustmann and Weiss (2007) enrich this model to integrate the relevance of human capital.

This model is further amended by integrating the possibility of different activity choices upon return into the optimal migration duration (Dustmann and Kirchkamp 2002). Piracha and Vadean (2010), and Borodak and Piracha (2011) deploy a similar framework allowing for the option of jointly deciding on return and activity choice, but ignore migration duration. Later, the theoretical approach was adjusted to consider the possibility of circular migration (Azzari and Carletto 2009; Vadean and Piracha 2010). Circular migration is not common among Kosovan migrants. A discussion on these extensions is not provided here given that it is out of the scope of this research.

The studies reviewed above, deploy either the individual or the eclectic approach to model the return decision. To fill this gap, Kotorri (2015) conceptualises return migration using the expected utility maximisation framework from the perspective of the household. In this paper, to analyse factors influencing the probability to return conditional on the length of stay abroad, the framework developed in Kotorri (2015) is extended. This extension is explained in detail in the section on Model Specification.

SURVEY AND DATA

This analysis is performed using a sample stemming from a survey of 1,600 Kosovan households conducted in 2012. The survey was based on the latest census of population (Kotorri et al. 2013). The sample is stratified by region, and within regions it is stratified by type of area, urban and rural. This was done to ensure representativeness, which is a key prerequisite for the accuracy of results. The observation unit is the household and household heads were directly interviewed. The survey was conducted by Economic Development Group in 2012 for the purposes of analysing migration and its accompanying components on the economic development of the home country. Accordingly, the data set contains information on both household members at home and those abroad. For this analysis, variables are created using the section on household members abroad which contains information on both those who are abroad and those who have returned. Hence, the total sample used for this analysis is reduced to 418 observations. Henceforth, migrant household refers only to that part of the household that is living or has lived abroad.

Given the focus of the investigation, the questions of interest are "in what year has the migrant household emigrated?", "has the migrant household returned permanently to Kosovo?", and "in what year has the migrant household returned to Kosovo?". As presented in Table 1, descriptives show that out of the total of 418 migrant households 64 have returned permanently to Kosovo.

Table 1: Migrant households, return migrant households and migration duration

Migrant households	418
Permanently return migrants	64
Shortest migration duration, years	0.5
Longest migration duration, years	56
Average migration duration, years	14
Standard deviation of migration duration, years	8.63

There is a very high difference between the longest (56 years) and the shortest time spent abroad (0.5 years) by migrant households, 55.5 years. The mean of the migration duration is 14 years, which is relatively low, around one-fourth of the longest time span. The standard deviation is 8.63 years.

Similar to empirical analyses using survey data, this analysis too suffers from missing data. Data missingness is the results of giving the respondents the option of refusing to answer. In this context, deploying listwise deletion (LD) implies ignoring incomplete cases resulting in loss of information, and as a consequence in inflated standard errors and reduced level of statistical significance. Also, potential systematic differences between the incomplete and complete cases are ignored which leads to inaccurate results. Thus, it is highly recommended that one uses techniques that handle missing data, such as multiple imputation (MI). Yet, LD is appropriate if data follow the missing completely at random mechanism (MCR). This implies that sample representativeness is not affected by data missingness and, in turn, the accuracy of results is not harmed. However, Little and Rubin (2002) consider that in survey data the MCR is too strong an assumption, and Cameron and Trivedi (2005) argue that it is nontestable. Given these arguments, multiple imputation to address data missingness is not performed in the empirical investigation reducing the sample size to 290 complete observations. Hence, it may be considered a limitation. Another limitation of

this investigation is the shortcomings associated with self-declaration. All variables, including the dependent variable (whether the household has returned and its migration duration) are self-reported rather than stemming from any official documents which could serve as proof for the declarations. Although they are not recognised explicitly, such limitations are a common characteristic of the empirical analyses reviewed above. Yet, for the purposes of our empirical investigation this sample data is one of the most adequate and rich sources of information available in Kosovo, despite its limitations. It is important to admit that focussing only on migrant households is a limitation of this analysis given the household approach.

MODEL SPECIFICATION

This analysis extends the conceptual framework elaborated in Kotorri (2015) and, thus, is built on the same basis as that developed in Kotorri (2010). Given social relations and the dominant system of values within Kosovan households and the absence in the literature of a fully articulated and consistent theoretical framework, Kotorri (2015) develops an initial theoretical framework for analysing household behaviour within the expected utility maximisation framework. She elaborates and examines several complementary hypotheses, aiming at investigating the applicability of the household approach in describing migration behaviour among KS-households. The results of both empirical investigations provide broad support for the validity of a household perspective in modelling migration decisions. Consequently, the household approach is deployed. Accordingly, return migration is modelled within the household decision-making process where the household as a whole tries to maximise utility subject to its income constraint. The maximisation problem varies according to two choices facing the household: 1) remain in the host country for an additional period or 2) return permanently to the home country. This theoretical framework guides the specification of hypotheses on the economic migration duration from the household perspective. Even though the theoretical framework is an extension of that developed in Kotorri (2015), for ease of following the empirical investigation it will be reproduced in full below and differences will be emphasised.

Prior to elaborating the extended conceptual framework, issues regarding endogeneity relating to return migration behaviour are discussed. Kotorri (2015) argues that Kosovan emigration consists of three waves and that return migration was rather unusual. The first wave is characterised by emigration based on labour programmes, the second by legal and illegal emigration for both political and economic reasons, and the last wave consisted of forced emigration. After 1989, the political situation worsened tremendously leading to return migration becoming extremely difficult. Back then, in case of visits to the home country, even for migrants with host country citizenship return to the host countries was uncertain. Uncertainty of return to the host country was even higher among illegal migrants most of whom did probably not even have legal residence abroad. Given Kosovo's great geographic distance from the host countries, successful re-emigration may have been very costly and less certain for both legal and illegal migrants visiting Kosovo. Consequently, it is assumed that there is no difference in unobserved characteristics between return migrant households and non-return migrant households which may impact on the return decision. Accordingly, the return decision is not expected to be endogenously determined. So, no bias in the empirical results is expected.

Given the nature of the empirical technique, the dependent variable is specified as the instantaneous hazard of return conditional on the current migration duration. For return migrant households, the migration duration is calculated as the difference between the year of initial emigration and permanent return. For non-return migrant households this is measured as the differences between the year of the initial emigration and the year of the survey.

Pecuniary income

For reasons explained in Kotorri (2015), the impact of pecuniary income is captured by current average gross monthly income per capita (YA)**.** Given household budget constraints and the cost of return, low-income households are assumed to need more time to accumulate capital in case of return. Hence, income has a positive impact on migration duration, all else equal. Yet, after a certain level of income is achieved, due to the diminishing marginal utility from wealth, the effect of this variable on the hazard to return is expected to be negative, all else equal. Accordingly, income is expected to have a non-linear relationship with the hazard to return. This effect is captured by introducing average monthly household income per capita abroad and its squared term.

Following Kotorri (2015), household demographic characteristics are introduced to reflect other wealth aspects. In case these variables capture other effects, it is discussed along with their definition.

Given the lower probability of finding paid

employment in Kosovo, having a higher share of those in working age who are in employment (SWAE) makes households perceive the risk related to return more strongly as they would have to leave their paid employment. Thus, SWAE is hypothesised as having a negative impact on the return hazard. To capture this effect, SWAE is introduced as a continuous variable.

It is expected that females are affected more than males by perceived undesirable social customs in host countries. Following this argument, households with a larger share of females are a priori assumed to prefer consumption in the home country. So, share of females (SF) is expected to have a positive impact on the hazard to return and is introduced as a continuous variable.

The educational attainment of the household head is use to proxy for human capital within the household. The better educated households are assumed to be more likely to have information on employment opportunities in host countries and better knowledge of foreign languages. Hence, they are hypothesised as having a higher probability of socio-economic integration leading to a lower hazard to return. However, they may have a lower likelihood of finding adequate employment abroad due to possible low interregional mobility of their skills and diplomas (Eggert, Krieger and Meier, 2010). Also, Borjas and Bratsberg (1996) argue that host countries are a type of magnet for the less educated. This leads to the better educated having a lower likelihood of being successful in the labour market, which in turn, reduces the likelihood of them experiencing appropriate socio-economic integration in the host country. Further, due to labour market premia in the Kosovan labour market, the better educated may be more willing to return. Hence, such households may perceive the utility from consumption at home to be greater increasing the hazard to return, all else equal. Following these arguments, a priori this variable is expected to have an ambiguous effect.

Psychic income

In addition to the household demographic characteristics introduced above, this analysis controls for the impact of whether the migrant household consists of only one member (Individual). However, unlike Kotorri (2015), this investigation is extended by introducing household size to capture other aspects of the effect of social interactions. The variable Individual is assumed to capture an effect similar to that of networks introduced in Kotorri (2010). So, it is hypothesised to have a negative effect on migrants' destination-specific utility leading to an a priori positive impact on the hazard to return, all else equal. This effect is captured by a dummy variable taking the value of one if the migrant household consists of only one member, zero otherwise. Unlike this variable, household size is assumed to control for the effect of family ties within the migrant household. So, a larger household size enables greater benefits from social interactions leading to higher psychic income in the host country, all else equal. It may also control for the nonlinear effect of continuous migration costs derived from economies of scale. Household size is expected to have a positive impact on psychic income lowering the hazard to return, all else equal.

Studies reviewed above suggest that having the citizenship of the host country is considered a specific social investment by migrant household. As such, it is modelled to control for the impact of greater preference for consumption in the host country resulting from increased socio-economic integration. Such households are expected to have a lower hazard to return, all else equal. To capture this effect a dummy variable is constructed taking the value of one if the household has the citizenship of the host country and zero otherwise.

Whether any household member has attained education at institutions in the host country is a variable that is hypothesised to capture another aspect of specific investments of migrant households. As such, this variable is expected to control for the impact of the greater destination-specific utility in the host country resulting from the increased level of socio-economic integration of members attaining or having attained education abroad. It is hypothesised to have a negative impact on the hazard to return. This variable is introduced as a dummy variable taking the value one if any member of the migrant household has or is attaining education abroad.

Unlike Kotorri (2015) and following the strategy of studies reviewed above, two additional variables are included, house ownership and business ownership among migrant households. In addition to an income effect, both capture different aspects of the effect of household psychic income. Hence, their effects are in principle different from that of income.

Owning a house in the host country is considered to capture yet another aspect of specific investment leading to an increased preference for consumption in the host country. This variable is expected to control for the effect of increased preference for consumption abroad due to the greater level of socio-economic integration. Moreover, if the household has used a mortgage to buy a house it will be legally bound to pay it back. Consequently, such households are likely

to have a longer migration span. Accordingly, a priori owning a house abroad is expected to negatively impact on the hazard to return, all else equal. To capture this effect a dummy variable is introduced taking the value one if the household owns a house, zero otherwise.

Whether the household owns a business abroad is expected to capture the effect of the preference for consumption in the host country resulting from the increased economic integration abroad. Owning a business implies intensive engagement and continuous management and oversight. So, this effect is different from that of owning a house. This variable is hypothesised as having a negative impact on the hazard to return. Yet, given that such households are expected to be more entrepreneurial and given social ties with household members at home, such households may have greater incentives to return for investment purposes. Hence, the a priori sign of this variable is inconclusive. It is constructed as a dummy variable taking the value one if the household owns a business abroad, zero otherwise.

Political situation

As argued above and following Efendic (2016) migration behaviour is affected by political stability. Accordingly, the decisions on return migration and migration duration of households that emigrated during the 1998/1999 war in Kosovo may be influenced by political rather than economic factors. Such migrant households are expected to be more likely to return to Kosovo and more likely to have a shorter migration duration. This specific political effect is controlled for by a dummy variable taking the value of one if emigration took place in 1998 or 1999, zero otherwise. The variable is expected to positively impact on the hazard to return.

As introduced above, the dependent variable is the instantaneous hazard of return conditional on the current duration of migration. The issue here is that the dependent variable is characterised by right-censoring. Households, which continue their migration spell after the year of the survey, are considered as right censored observations, whereas households, which have returned to the home country, are considered as having 'failed'. Right-censoring, which is a problem in linear regressions, can be handled by deploying censored normal-regressions. Possible techniques within this framework are also binary analysis methods. These have the advantage that they do not impose any assumption on the distribution of failure time. However, they focus only on the probability of return ignoring differences in migration durations and thus lead to the inefficient use of the data (Cleves, Gould and Gutierrez 2002).

Given these arguments, other techniques are required. In this context, the Cox proportional hazards model is an appropriate technique as it does not assume normality and so overcomes issues which render binary regression models problematic. It also efficiently uses the data by considering both return and migration duration.

The Cox model is a semi-parametric model, which takes the form of Equation (1.1). The dependent variable is the instantaneous hazard of return to the home country of the household at time t, conditional on migration duration and is a function of the independent variables (covariates) and an unknown and arbitrary baseline hazard function of time:

$$h_i(t) = h_0(t)\exp(x_i^{'}\beta_x) \quad (1.1)$$

where $h_j(t)$ is the hazard of return migration of household i at time t conditional on having survived up to time t, that is, conditional on having remained in the host country up to time t, and $h_0(t)$ is the baseline hazard rate. x_j is a vector of explanatory variables, consisting of pecuniary income (py), a set of variables representing psychic income (psy), and a set of variables representing migration costs (mc), while β_x is a column vector of regression coefficients.

This model is based on the proportionality assumption which implies that the effect of the covariates is proportional over the entire baseline hazard (Cleves, Gould and Gutierrez 2002). So, irrespective of its shape the baseline hazard function is the same for all observations and the hazard rate of an observation depends only on the covariates. This assumption represents the key issue when deploying the Cox model (Box-Steffensmeier and Jones 2004) and it can be tested by standard tests, which are based on residuals.

Key to this method is the estimation of regression parameters, while the baseline hazard in which the intercept is subsumed is not estimated (Cox 1972; Cleves, Gould and Gutierrez 2002). This advantage is particularly important in a context where no adequate assumptions about the shape of the hazard can be made (Cleves, Gould and Gutierrez 2002). Any incorrect assumptions would lead to efficiency loss and consequently inaccurate results.

Guided by the theoretical framework and based on the above, the empirical model is presented in Equation 1.2 (all the terms are defined above):

$$h_i(t|py, psy, mm) = h_0(t)\exp(\beta_1 py + \beta_1 psy + \beta_1 mc) \quad (1.2)$$

EMPIRICAL ANALYSIS

The Cox model is estimated using the maximum partial likelihood method. This method has large sample properties. As this empirical investigation is based on a sample of around 418 observations (migrants' households) of which 64 are failures (return migrants' households), the importance of sample size and baseline risk in Cox models regarding biasness is discussed. Adam et al. (2004) investigate the bias of ML estimators in small samples by comparing Maximum Likelihood (ML) and the Method of Moments (MOM). The authors run a number of simulations by allowing sample size to increase and argue that the ML estimator of the variable of interest is considerably upward biased for samples smaller than 50 observations. Further, they find that the sample size must be at least 220 (450) observations so that the bias of the ML estimator be smaller than 10 (5) per cent. Given that this analysis is based on a sample size of slightly less than 450 observations, one may expect a bias of around 5 per cent.

Biasness is also dependent on the number of failures in the sample. Samples with a number of failures less than 5, and sometimes less than 10, are considered to be small. Hence, the MLEs can be biased estimators of the true population and the large sample properties may not apply leading to bias in Cox models. Yet, this does not apply to this analysis, as the number of failures in this sample is 64.

Following the results from the Cox model of the probability of return conditional on migration duration are interpreted. Given the discussion above, the results have to be considered with caution regarding biasness resulting from small sample size and low number of failures in the sample.

Diagnostics tests

Prior to the interpretation of empirical results, as suggested in Cleves, Gould and Gutierrez (2002) the proportional-hazards assumption and the predictive power of the model are tested. The Schoenfeld test of the proportional-hazards assumption is based on the examination of residuals. Results indicate that the proportional hazards assumption is not violated, chi2(12)=20.27 and p=0.06. The Harrell's C concordance statistic is used to evaluate the predictive power of the Cox model. This statistic can take values between zero and one. A value of 0.5 implies no predictive power. In this analysis, the Harrell's C statistic is 0.85 which is greater than the reference statistic of 0.5 suggesting that the predictive power of the model is relatively good.

The exponential of the estimated coefficients are taken to give the hazard ratios for a one-unit change in the corresponding covariate. The direction of the impact of exponentiated coefficients is determined based on whether the coefficient is lower or greater than one. A negative impact is implied by the former case, while a positive by the latter (Cleves, Gould and Gutierrez 2002).

As shown in Table 2, contrary to expectations results provide no support for the inverse U-shaped relationship between migrant household average monthly income per capita and migration duration. Results indicate that the relationship is linear and negative. So, household income has a negative impact on the hazard to return to the home country, all else equal. Of the variables capturing the effect household demographic characteristics the only statistically significant variable is the share of females. Empirically, we find that having a larger share of females in the household reduces the hazard to return. This is inconsistent with the hypothesis that in Kosovan migrant households females may be more likely to be affected than males by perceived negative social customs in the host country. An explanation could be that females are more likely to appreciate and adopt the host-country specific system of values allowing for more freedom of choice for the individual leading to a stronger socioeconomic integration and so lower hazard to return. A priori, the expected sign of the impact of the household head having higher education was ambiguous. Results suggest that it has no significant impact, implying that the estimates do not provide support for either hypothesis.

Among the variables controlling for the impact of psychic income, the dummy variables Citizenship and Houseownership are statistically significant. However, the latter variable is statistically significant only at 10% level. Theoretically, they are expected to have a negative impact on the hazard to return. Results suggest that households that have the citizenship of the host country have a lower hazard of return. This supports the hypothesis that households having the citizenship of the host country have a higher level of socio-economic integration, implying that they have a higher preference for consumption in the host country. Households owning a house abroad are found to have a greater hazard to return. This contradicts the hypothesis that such households have a greater preference for consumption in the host country given their investments. Although statistically insignificant (p=0.11), probably due to being statistically not well defined, owning a business has a very strong positive impact on the return hazard.

Theoretically, it is argued that households that

Table 2: The estimated determinants of migration duration

Variable	Hazard Ratio	P> | t |	Expected sign
Household Characteristics			
YA	0.99	0.06**	Greater than 1
YASQ	1	0.90	Less than 1
SWAE	0.99	0.30	Less than 1
SF	0.98	0.04**	Greater than 1
Education	1.2	0.66	Ambiguous
Psychic Income			
Individual	0.53	0.29	Less than 1
Householdsize	0.81	0.28	Less than 1
Citizenship	0.30	0.01***	Less than 1
EduInstitution	0.59	0.30	Less than 1
Houseownership	1.85	0.10*	Less than 1
Businessownership	2.30	0.11	Ambiguous
Political situation			
Year1998/99	3.01	0.01***	Greater than 1
Number of observations	290		
Number of failures	39		
Time at risk	42.41		
LR chi2(12)	68.50	0.001	
Log likelihood	-147.23		
Test of the proportional-hazards based on the Schoenfeld residuals chi2(12)	20.27	0.06	
Harrell's C concordance statistic	0.85		

have emigrated during the war makeup a specific group for which, at least, the initial emigration motive may be considered as forced. Thus, such households are expected to have a greater hazard to return compared to households that belong to migration waves that took place before or after the war. Empirically, we find a strong statistically significant difference (at the 1% level) in the return decision between the two groups. Households that have emigrated during the war have a three times higher hazard to return compared to the reference group, all else equal.

The household approach deployed here is more limited than that deployed in Kotorri (2010) due to the definition of the household, resulting from missing data on the part of migrant or non-migrant households. Overall the results are not completely in line with the theoretical expectations of the model. Out of the variables for which theoretically the signs were statistically clearly defined, for six of them the results are in line with the theoretical expectations: share of those of working age employed, household size, citizenship, education institution, and the year dummy. However, only one of them is statistically significant. Education and Businessownership are the only variables for which the a priori impact was not clearly defined. Empirically, both have a positive but insignificant effect. It is important to note that the statistical insignificance may be due to cancelling out of opposing effects. Inconsistency with theoretical expectations is found regarding the variable that controls for the share of females within the household, whether the migrant household consists of one member only, whether the household owns a house and whether the household owns a business. Yet, with the exception of share of females the other variables are not statistically significant.

As a sensitivity analysis, the model specification in Kotorri (2015) is estimated using this sample (Appendix 2). The results are almost identical to those reported in Table 2.

CONCLUDING REMARKS AND POLICY RECOMMENDATIONS

In this paper, the conceptual framework of Kotorri (2015) is extended and an empirical model is specified to investigate the determinants of the probability to return conditional on migration duration. It is estimated using the Cox model on a sample of over 400 Kosovan migrant households.

The diagnostic tests indicate that the predictive power of the model is relatively strong and overall the model is correctly specified providing support for the hypothesis that there is no evidence of non-proportional hazards, which is a fundamental consideration with the Cox model. The results provide mixed support for the theoretical expectations of the model raising doubts about the applicability of the household approach in modelling return migration. One explanation could be that, as acknowledged, given the definition of the household, this household approach is considered more limited than that deployed in Kotorri (2015). Another explanation for this may be that migrant households while going through a process of socioeconomic integration adopt social customs and norms specific to host countries. Thus, the Kosovan social relations and the system of values among migrant households fade away. These results warrant further research on the applicability of the household view given the arguments in favour of it provided in Kotorri (2010).

Contrary to Kotorri (2015), there is no evidence of the hypothesised non-linear relationship between income and the hazard to return. Similar to results of this research, Carrion-Flores (2006) finds the impact to be significantly negative and linear.

Unlike Carrion-Flores (2006) and Gundel and Peters (2008), higher levels of education are not found to have a statistically significant effect on return. From a policy perspective, this analysis does not provide support for either a Brian Drain or Brain Gain from return migration. Contrary to Kotorri (2015), there is no support for a Brain Gain resulting from the higher probability of return if the household has members educated or attaining education in the host country. Although statistically insignificant, this variable actually has a negative impact on the hazard to return.

Similar to Kotorri et al. (2013), that ignore the time relevance, but contrary to Kotorri (2015), the findings indicate that having a higher share of females implies a lower hazard to return. An explanation for this may be that Kosovan females prefer the position of the female within the foreign system of values resulting in a faster socioeconomic integration abroad.

Having the citizenship of the host country and owning a house are statistically significant. The former variable has the expected negative sign which supports the hypothesis put forward earlier on such households have a higher preference for consumption abroad. Although they used a slightly different variable, the results in Gundel and Peters (2008) and Sander (2007) show a similar effect. Contrary Gundel and Peters (2008) and Sander (2007), findings reveal that owning a house increases the hazard to return. However, this variable is only statistically significant at the 10% level. Businessownership, although statistically insignificant reveals that such households have a greater hazard to return.

Similar to Kotorri (2015) and Kotorri et al. (2013) and in line with empirical findings in Efendic (2016) about the importance of political factors in shaping migration behaviour, as well as consistent with theoretical expectations, results indicate that migrant households that have emigrated during the war have a higher hazard of return. This finding supports the relevance of the war effect on migration behaviour among Kosovan households.

In sum, the statistically significant effect of the income variable, having the host country citizenship controlling for the effect of socioeconomic integration and this strong effect of the variable controlling for the effect of political events suggest that the return migration behaviour of Kosovan migrant households is determined by both economic and non-economic factors.

Due to the large number of Kosovan migrants and their potential benefits to fostering development, it is important to derive policy recommendations. The findings reveal that those that have businesses in the host countries are more likely to return suggesting the need for policies aiming at improving the business environment and business investment promotion policies to encourage migrants to return and invest utilising their financial and human capital, and business networks. Second, such policies should focus on maintaining cooperation among the Kosovo government, Kosovo-based business associations and migrant host-country based business associations in identifying investment opportunities, and the need for customised support in establishing businesses and other relevant government support instruments.

The Kosovo government is implementing repatriation programmes with host countries. As return migration is more likely among those that have emigrated during the 1998/9 War and lower-income households, it is recommended that the government continues these programmes in the future. Stronger emphasis within these programmes should be put on supporting returnees in acquiring education and training upon return and providing speedy and low cost accreditation of qualifications for those that have

acquired human capital abroad. Such programmes should focus on potential returnees in general.

Additionally, in the world of technological advance, policies should focus on lowering travel costs rather than communication costs to encourage the maintenance of family ties between migrant and non-migrant members and migrants' ties with the home country. In turn, such policies would encourage return. Lastly, to ensure their effectiveness, policy recommendations should be followed by evaluation strategies.

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APPENDIX 1

Table A1: Variable Lable, Variable Description, and Descriptive Statistics

Variables	Description	Mean	Standard deviation
YA	Household income per capita in Kosovo	1860.30	1993.34
YASQ	Household income per capita in Kosovo, squared		
Household demographic characteristics			
SWAE	Share of those of working age who are in employment	83.75	32.76
SF	Share of females	13.25	23.47
Edu	Equals 1 if the household head has higher education, 0 otherwise	0.15	0.35
Psychic income			
Individual	Equals 1 if the household consists of only one member, 0 otherwise	0.6	0.49
Householdsize	Number of household members within a household	1.8	1.3
Citizenship	Equals 1 if the household has the citizenship of the host country, 0 otherwise	0.65	0.48
EduInstitution	Equals 1 if any of the household members has attained or is attaining education at any institution abroad, 0 otherwise	0.21	0.41
Houseownership	Equals 1 if the household owns a house in the host country	0.30	0.45
Businessownership	Equals 1 if the household owns a business in the host country	0.06	0.23
Political situation			
Year1998/99	Equals 1 if household emigrated in 1998 or 1999, zero otherwise	0.14	0.34

APPENDIX 2

Table A2: The estimated determinants of migration duration, replication of Kotorri (2015)

Variable	Hazard Ratio	P> | t |	Expected sign
Household Characteristics			
YA	0.99	0.03**	Greater than 1
YASQ	1	0.95	Less than 1
SWAE	0.99	0.56	Less than 1
SF	0.98	0.05**	Greater than 1
Education	1.12	0.78	Ambiguous
Psychic Income			
Individual	0.73	0.51	Less than 1
Citizenship	0.32	0.01***	Less than 1
EduInstitution	0.47	0.12	Less than 1
Political situation			
Year1998/99	3.08	0.01***	Greater than 1
Number of observations	290		
Number of failures	39		
Time at risk	4241		
LR chi2(9)	62.76		
Prob>chi2	0.001		
Log likelihood	-150.10		
Test of the proportional-hazards based on the Schoenfeld residuals chi2(12)	16.63	0.054	
Harrell's C concordance statistic	0.84		

DE GRUYTER OPEN

South East European Journal of Economics and Business
Volume 12 (2) 2017, 47-60
DOI: 10.1515/jeb-2017-0015

THE IMPACT OF NATIONAL ECONOMY STRUCTURAL TRANSFORMATION ON REGIONAL EMPLOYMENT AND INCOME: THE CASE OF LATVIA

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Abstract

Structural changes taking place in national and regional economy may vary across nations and regions, causing socio-economic differentiation. This research is focused on analysis of the employment structure, its changes and influence on the level of social welfare, and its deepening of economic disparities between Latvian regions. We apply a comparative statistical analysis based on two tools: the Location Quotient and shift-share analysis, using official Latvian statistical data on employment and income with a breakdown by ten groups of economic activities for the period from 2008 to 2016. The obtained results indicate that the changes in the employment structure during the studied period had a noticeable impact on regional differentiation in Latvia. The authors have discovered that although employment concentration varies across Latvian regions, it remains remarkably stable over time, with occasional re-employment shifts occurring not always in the direction of industries providing higher income, which causes further regional socio-economic differentiation in Latvia.

Keywords: *regional economics; employment structure; income; structural changes; comparative analysis; location quotient.*

JEL classification: *J21, J31, R11*

1. INTRODUCTION

The balanced development of all regions is vital for the sustainable growth of each country and the prosperity of its population. Nevertheless, each country faces various obstacles connected with the different types of disparities that prevent it from reaching these goals. Latvia has been an independent country for twenty-five years, and for more than ten years it has been a member-state of the European Union. During this period, Latvia has undergone considerable changes on its way of development and growth. The first decade of the reestablishment of independence was marked by extensive economic, social and political changes in the process of sustainable growth and social well-being. These changes also affected territorial division within the country. The territory of Latvia is divided into the following six statistical regions: Riga, Pieriga, Vidzeme, Kurzeme, Zemgale, and Latgale.

Latvia and its statistical regions still face various challenges. One of the factors impeding the economic

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development of Latvia is the high regional differentiation between the Riga region and other regions of the country (Central Statistical Bureau of Latvia, 2017). Although there is some evidence of convergence at the national level for EU countries, in most cases regional convergence within countries is not observed, especially in Latvia, where the level of divergence between regions is persistent over time and remains one of the highest across the EU, including the other two Baltic countries (Mikulić, Lovrinčević, and Nagyszombaty 2013; Melihovs and Kasjanovs 2011). However, there has not been any recent research that has studied regional differentiation in Latvia.

Moreover, the process of structural changes, in terms of output and employment distribution between different types of economic activity, takes place not only at the national level, but also affects the structure of regional economies. As has been claimed, structural changes do not contribute in all cases to rapid economic growth (McMillan, Rodrik, and Sepúlveda 2016). Unfortunately, in the case of Latvia there have not been any recent studies that would link the process of structural changes with regional differentiation through the analysis of changes in employment distribution and income.

The case of Latvia is important for research because it had the highest rates of GDP growth among EU member states before the economic crisis of 2008-2010, which was followed by the deepest downturn within the EU as the overall GDP decreased by 21.3% (Skribane and Jekabsone 2013). Therefore, the goal of this research is to analyze the changes in the employment structure and income across ten groups of economic activity in Latvian statistical regions and to find out whether the changes in the employment structure have any impact on regional socio-economic differentiation. To conduct the research, we applied a comparative statistical analysis for the period of 2008-2016.

The structure of the research is organized as follows: First, we define the types of economic activity in terms of employment in which a certain statistical region specializes, applying the Location Quotiet as a tool for this part of our research. Second, we analyze the impact of the changes in the employment structure on the changes in income across Latvian regions, applying the breakdown of income changes. Third, we compare the level of income in a certain type of economic activity with the average income in a certain region and with the average income at the national level in a particular type of economic activity. Finally, we draw a conclusion on the revealed specialization of certain regions and their existing employment structure, and whether the changes in it contribute to the development of the corresoponding region.

2. THEORETICAL BACKGROUND

2.1. Aspects of regional disparities

Regarding regional disparities within one country or between multiple countries, Wishlade and Yuill (1997) and other authors (Tvrdoň and Skokan 2011; Kutscherauer et al. 2010) distinguish and apply for analysis three types of disparities – physical, economic and social disparities. However, a precise assignment of factors to each particular type of disparity has not yet been developed.

According to Wishlade and Yuill (1997), the following factors characterize the relevant types of disparities:

- *Territorial* or *physical* disparities are used to estimate the natural environment of a certain territory with its advantages and disadvantages. These indicators mostly aim to evaluate climate conditions and environment, the development and availability of infrastructure, population density and its changes over time;
- *Economic* disparities refer to the economic potential of the region and its possibility to contribute to employment, with added consideration given to the structure of the economy. The most well-known and traditional indicator for the aforementioned purposes is GDP per capita. Moreover, the evaluation of the economic situation in the region also incorporates the analysis of tax revenues, transport facilities and demographic trends;
- *Social* disparities relate to the level of income and standards of living, with a focus on employment indicators, i.e. unemployment and its structure, employment trends, etc.

Many authors have studied social and economic challenges to an economy and resulting socio-economic disparities. For example, Kutscherauer et al. (2010) apply a three-type division of regional disparities and factor assignment similar to the one described above, while for economic factors they use an analysis of employment beyond the previously mentioned indicators. For example, the most frequently applied indicators within the EU regarding economic disparities are GDP per capita and disposable income. To assess social differences, employment and unemployment rates are applied, as well as indicators related to tertiary education (Poledníková and Lelková 2012). The economists suggest that income and employment have an impact on social as well as economic disparities within a country – social well-being depends on people`s employment status and the level of their income. Higher employment rates and income levels are tied to higher living standards and greater potential growth. Therefore, it is necessary to analyze

income (wages, salaries, and other types of remuneration that represent a considerable part of workforce income, and consequently disposable income) and its changes in Latvia and statistical regions to disclose the aforementioned disparities.

2.2 Structural changes and specialization

In addition to research on income, currently economists are also concerned with the structure of the national economy, because this structure affects the potential for national development. As Stiglitz notes (Stiglitz 2011), structural changes in a national economy have a considerable effect on the development of a sustainable economic strategy.

The process of structural changes has attracted economists` attention for a long time and is still discussed in the literature, as well as in in the context of Latvia (Skribane and Jekabsone 2013; Šipilova and Baldi 2013; Mihnenoka and Saulītis 2013). Structural changes in a national economy also imply changes in the sectoral composition of output and employment. Clark (1940) proposes the most applicable and traditional division of the national economy – he distinguishes three sectors of the national economy: agriculture, industry and services or the *primary, secondary* and *tertiary* sectors. In addition, Fisher (1939), Wolfe (1955), Fourastie (1954) and others have also made a considerable contribution to the explanation of the sectoral division of a national economy and its changes Kruger (2008), Silva and Teixera (2008) have summarized the theoretical aspects of structural economic changes. For instance, Fourastié, Fisher and Clark claim that during the process of economic development, employment first shifts from agriculture to manufacturing and then to services. This is the core aspect of the three-sector hypothesis.

Kuznets (1973) has made a significant contribution to the research on economic growth and interpretation of the process of structural changes. He has discovered the relationship between an increase in GDP level per capita and a shift in the structure of consumption. He states that, among other factors, technological progress is the primary source of economic growth and structural changes. In addition, there is some evidence that aggregate economic growth causes structural changes, as well as the other way round (Dietrich 2012). All of this points to the necessity for the planned development of a national economy's structure.

The rise of the tertiary sector, especially knowledge-based services, is a predominant pattern of structural changes in most countries today (Wölfl 2005). In addition, it is widely known that manufacturing contributes to national development and regional development (Stojčić, Bezić, and Galović 2016). Therefore, concerns regarding the decrease of manufacturing share and the necessity of reindustrialization at the national and regional level routinely appear. Moreover, Wolfi (2005) points out that services and manufacturing interact with each other, which may be beneficial for all industries. For example, the transitional period in Latvia since the reestablishment of independence was also characterized by large shifts in the sectoral composition of output and employment (Havlik 2005; Šipilova 2012) towards the adjustment to developed economies, reducing the shares of the primary and secondary sectors and increasing the importance of the tertiary sector.

Therefore, attention to the driving forces behind these changes and development is also increasing (Peneder, Kaniovski, and Dachs 2003; Peneder 2009). Moreover, in terms of output and employment distribution, sectoral structure is an additional factor that influences, affects and provokes regional differentiation (Šipilova 2013; Šipilova and Baldi 2013). In addition, O'Leary and Webber (2015) claim that the reallocation of workforces between and within sectors has a positive impact on productivity growth at the national and regional levels, increasing the income of employees. However, the researchers admit that structural changes for richer regions promote divergence, while structural changes implemented for relatively poor regions that are falling behind the average growth pace may contribute to convergence to the average (O'Leary and Webber 2015).

Moreover, the investigation of the economic specialization of regions and/or countries is becoming increasingly topical among researchers in the world (MPS Task Force of the ESCB 2004; Kemeny and Storper 2015) and especially in Latvia (Šipilova and Baldi 2013), as the structure of the national economy has been significantly reshaped after the reestablishment of independence and the transition to a market economy. Consequently, regional specialization and the concentration of certain types of economic activities in these regions are important factors that may also affect regional disparities I (Makarem, Storper, and Kemeny 2015).

3. RESEARCH DATA AND METHOD

The structure of a national as well as regional economies can be studied from the vantage of GDP and employment distribution, with a breakdown by sectors and/or a broader division by types of economic

activity, while the income of employees is a significant indicator for the study of socio-economic disparities. Therefore, we applied a comparative statistical method to analyze changes in employment structure and income occurring during the years 2008-2016, and to reveal the impact of the structural changes on social welfare across Latvian regions.

The research data were compiled from the *Central Statistical Bureau of Latvia* (2017). The choice of the period from 2008-2010 was based on the assumption that the year 2008 was the last year prior to the economic downturn, which caused considerable structural changes in the economy of Latvia, while reliable statistical data were available only till 2015/2016 (we used the last available data). The data comprise the following indicators for six statistical regions of Latvia and for the country as a whole: the number of employees and the average monthly income in economic activities based on NACE 2. Rev. division; and data on income, including basic wages and salaries, all remunerations, bonuses, compensations, employees` social security compulsory contributions and personal income tax. The data are analyzed for the following six statistical regions of Latvia: Riga, Pieriga, Vidzeme, Kurzeme, Zemgale, and Latgale.

First, the structures of national as well as regional economies were divided into ten groups of economic activities: agriculture, forestry and fishing (A); manufacturing, mining, quarrying, and power engineering (B-E); construction (F); trade, hospitality and catering s (G, I); transportation and storage, and information and communication technologies (ICT) (H, J); financial, insurance, scientific, administrative and real estate (K-N); public administration, defence, and compulsory social security (O); education (P); human health and social work (Q); other services such as arts, entertainment, recreation and others (R-U). Hereinafter the authors use the aforementioned abbreviations for types of economic activities.

Second, we aggregated and sorted the data on average monthly income from nineteen economic activities to ten groups of economic activities using the method of a simple average, because the employment data for regional purposes had been already provided in the breakdown by ten branches. Furthermore, the authors calculated the real income adjusted for inflation using Consumer Price Indices with the reference period 2010=100.

Finally, to conduct the research the authors applied the following tools: Location Quotient and breakdown of income change.

3.1. Location Quotient

To identify regional specialization in terms of employment distribution between industries (10 groups of economic activities) within a certain region, the authors used *Location Quotient (LQ)*, which is similar to the *Balassa index*. Researchers widely apply it to make an assessment of area composition (MPS Task Force of the ESCB 2004; Gokan 2010; Šipilova and Baldi 2013; Fracasso and Vittucci Marzetti 2017). It is defined as follows:

$$LQ = \left(\frac{E_j^i}{E_C^i}\right) \div \left(\frac{E_j}{E_C}\right). \quad (1)$$

In Formula 1, LQ is *Location Quotient*, which reveals local preferences regarding the aggregate area. The following notation is used. LQ is a Location Quotient for an industry (a type of economic activity) i in a region j. E is an employment; however, in other cases instead of data on employees data on value added or even income can be used. The subscript i, j, and c identify a type of economic activity, a region, and the whole country respectively.

The first part of Formula 1, the dividend, displays a regional percentage share of a certain activity, in other words, the share of employees that are engaged in a certain activity within this region. The divider in Formula 1 represents the share of employees that are engaged in a certain activity within the whole country. The values of LQ are interpreted as follows (Dinc 2002; Gokan 2010):

- If LQ takes values higher than 1, this indicates a regional comparative advantage of a region j in a type of economic activity i relative to the reference country c. That is, in region j in economic activity i relatively more people are employed than in country c as a whole;
- If an LQ is equal to 1, a type of activity i has the same share of employment in a region R as it does in the reference area c;
- If an LQ is less than 1, that implies that the share of regional employment j is smaller than the share of national employment c in the same activity i.

According to Sayago-Gomez and Stair (2015), LQs of economic activities are basically used to define the industries that either make a regional economy unique or are not appealing to employees, as well as to identify the most export-oriented industries and still developing activities in the region. Implementation of the LQ tool makes it possible to map spatial patterns of industrial concentration, while the investigation of changes in LQs provides useful information on whether each type of economic activity is increasing or

decreasing its concentration and importance in a local area relative to other areas (Dinc 2002). Economic activities that compose specialization contribute to the growth of exports and increase the level of employment. Therefore, the LQ tool is applicable for both national and regional policymaking purposes to facilitate economic growth and development of this area. For the case of Latvia, the results of LQ value measurement are presented in Subsection 4.1.

3.2. Decomposition of income changes

Regarding the decomposition of changes in income, the authors implemented the "shift-share analysis" adjusted to the evaluation of the changes in income of employees, considering the impact of changes in employment shares. This method is proposed by Keller (2009); however, in this study we used it with some modifications in order to reveal how the average level of income in Latvian statistical regions has changed due to employment shifts between economic activities. Instead of occupational division, the method was used in terms of employment distribution, applying a breakdown by 10 types of economic activity, i.e. decomposition was made not for the national but for the regional level.

Assuming that the change in the real average income in a certain region depends on three components (Keller 2009) – a regional income component, a regional employment component and a regional residual component, the authors use the following mathematical notation to describe the decomposition:

$$\overline{w_{t+1}} - \overline{w_t} = \overline{w_{t+1}} - \overline{w_t} =$$

$$\underbrace{\sum_{i=1}^{i}\left(\frac{E_i}{E}\right)_t \Delta\overline{w}_i}_{\text{Regional income component}} + \underbrace{\sum_{i=1}^{i}\overline{w}_{it}\,\Delta\left(\frac{E_i}{E}\right)}_{\text{Regional employment component}} + \underbrace{\sum_{i=1}^{i}\Delta\overline{w}_i\;\Delta\left(\frac{E_i}{E}\right)}_{\text{Regional residual component}}, \quad (2)$$

where:

- i – a type of economic activity, in a total 10 groups of the aggregated branches, (A-U),
- Δ – change from 2008 to 2016,
- $\overline{w}$ – real average income of a certain region,
- $\overline{w_i}$ – real average income in an economic activity i within a certain region,
- E – number of employees in a region,
- E_i – number of employees in an economic activity i in a certain region,
- t – the year 2008,
- $t+1$ – the year 2016.

The first constituent of Formula 2 is the regional income component. It displays the contribution of changes in income of the particular economic activity to the changes in the regional average income. If this component is positive, this indicates that the mean income in a particular economic activity has increased during the research period, while a negative result indicates a decrease.

The regional employment component, the second constituent of Formula 2, represents the contribution of changes in the employment structure to the changes in average regional income level. If this component is positive, the employment share increased during the research period, but the negative component indicates the opposite result.

The third component of Formula 2, the residual, captures the joint effect of changes in employment share and income, though it is not solely attributed neither to the employment effect nor to the income component. Therefore, in terms of this research, it is less significant.

The sum of all three components for all economic activities represents the change in the real average income in a certain region. For the case of Latvia, the results of the breakdown in income changes are presented in Subsection 4.2.

4. RESULTS AND DISCUSSION

4.1. Employment specialization in Latvian regions

Table 1 presents the results of Location Quotient calculations for 2016 (Column 2); its percentage changes from 2008 to 2016 (Column 3) and employment share (Column 4) varies by the type of economic activity (Column 1) in Latvian statistical regions. The highest values of LQ in 2016 are marked out in bold in Columns 1 and 2. The results in Table 1 are based on the authors` calculations, using the statistical data compiled from the *Central Statistical Bureau of Latvia* on the number of employees with a breakdown by the type of economic activity and region.

The results of this analysis not only display the trends in employment specialization, i.e. employment concentration and its change in regions, but also reveal that regions do not perform equally. Furthermore, it becomes evident that there are several types of economic activities, which are typical of the Latvian national economy.

Table 1. Location Quotients and employment shares (%) by the type of economic activity and statistical region of Latvia, in 2016

Type of activity	LQ 2016	ΔLQ from 2008 to 2016 (%)	Employment share in activity ***i*** in region ***j*** (%)
1	2	3	4
Riga region			
(A)	0.09	***97.0***	0.7
(B-E)	0.83	-14.2	12.9
(F)	0.84	***-18.4***	6.8
(G, I)	**1.12**	-5.0	***19.9***
(H, J)	**1.32**	0.9	***16.4***
(K-N)	**1.57**	1.7	***17.9***
(O)	0.87	3.5	5.7
(P)	0.89	11.4	8.3
(Q)	1.00	2.6	6.2
(R-U)	**1.14**	10.4	5.3
Pieriga region			
(A)	0.96	2.7	7.6
(B-E)	***1.08***	**14.7**	***16.8***
(F)	***1.11***	5.7	8.9
(G, I)	1.04	-8.0	***18.5***
(H, J)	0.90	9.8	11.2
(K-N)	0.97	5.7	11.1
(O)	1.04	6.1	6.9
(P)	0.91	-10.9	8.4
(Q)	0.84	-16.9	5.2
(R-U)	***1.13***	-7.2	5.2
Vidzeme region			
(A)	**2.11**	0.0	7.6
(B-E)	1.06	18.8	***16.8***
(F)	**1.26**	***35.1***	8.9
(G, I)	0.81	-15.9	***18.5***
(H, J)	0.62	-5.1	11.2
(K-N)	0.44	***-42.9***	11.1
(O)	1.10	13.9	6.9
(P)	1.15	2.4	8.4
(Q)	1.13	15.8	5.2
(R-U)	0.91	9.9	5.2

Type of activity	LQ 2016	ΔLQ from 2008 to 2016 (%)	Employment share in activity ***i*** in region ***j*** (%)
1	2	3	4
Kurzeme region			
(A)	***1.48***	***-12.7***	11.8
(B-E)	**1.22**	-3.8	***19.0***
(F)	***1.12***	***32.9***	9.0
(G, I)	0.91	32.8	***16.1***
(H, J)	0.97	-5.9	12.1
(K-N)	0.57	-3.3	6.6
(O)	0.89	-12.1	5.9
(P)	1.08	-4.9	10.0
(Q)	0.87	1.2	5.4
(R-U)	0.89	-7.1	4.1
Zemgale region			
(A)	***1.72***	***24.1***	13.7
(B-E)	***1.12***	16.3	***17.4***
(F)	1.05	-14.5	8.4
(G, I)	1.00	2.9	***17.7***
(H, J)	0.76	5.2	9.4
(K-N)	0.63	-15.6	7.2
(O)	1.10	0.8	7.3
(P)	1.00	-1.6	9.3
(Q)	1.03	14.7	6.4
(R-U)	0.68	***-34.1***	3.2
Latgale region			
(A)	***1.65***	-4.8	13.1
(B-E)	1.00	-2.6	***15.6***
(F)	0.90	6.0	7.2
(G, I)	0.84	12.7	***15.0***
(H, J)	0.80	***-11.2***	10.0
(K-N)	0.63	***24.3***	7.2
(O)	**1.23**	-8.6	8.1
(P)	**1.28**	1.6	11.9
(Q)	**1.25**	-2.6	7.8
(R-U)	0.89	14.3	4.2

Source of raw data for authors` calculations: *Central Statistical Bureau of Latvia (accessed in 2017)*

Regarding the data in Table 1, the Riga region distinctly specializes in four groups of economic activities – trade and related activities (G, I), transportation, storage and ICT (H, J), financial activities (K-N), and other services (R-U). In the Riga region, these industries, except other services (R-U), engage the highest shares of employees in comparison with the other activities in the region – 19.9%, 16.4% and 17.9% of employees, respectively.

During the research period, the Riga region increased its employment specialization (change of LQ) in almost all activities, except industry and power engineering (B-E) and construction (F), which declined by 14.2% and 18.4%, respectively. Specialization in the Riga region can be explained by the high economic activity of the region: it is the capital of Latvia and its financial and communications center, which contributes to the whole country.

The Pieriga region does not stand out in terms of any type of economic activity regarding employment concentration in comparison with other regions. However, in terms of regional importance, it can be stated that Pieriga has LQ values close to specialization in industry and power engineering (B-E), construction (F) and other services (R-U). Furthermore, the Pieriga region has the lowest dispersion of LQ values – the concentration of employees in the sectors of economic activities is rather similar to the national distribution.

In comparison with other regions, the Vidzeme region strongly specializes in agriculture (LQ=2.11) and construction (F); the latter specialisation has increased by 35.1% since 2008. However, the highest employment shares in the region are in industry, power engineering (B-E) and trade, hospitality and catering activities (G, I); these comprise 16.8% and 18.5% of employment, respectively.

The Kurzeme region, similarly to Vidzeme, has the highest employment shares in industry and power engineering (B-E) and trade, hospitality and catering related activities (G, I), but its highest level of specialisation nationally is in industry and power engineering sector (LQ=1.22). In terms of regional importance, agriculture and construction, where employment specialization has increased the most during the research period, can also be marked as significant relative to other regions.

The Zemgale region is similar to Pieriga and has no obvious employment specialization. However, since 2008 it has displayed an increase in employment concentration in agriculture (by 24.1% to LQ=1.48). There is also the highest share of employees in the primary sector in comparison with other regions, while high LQ values are also marked in agriculture (A), industry and power engineering (B-E), which form relative advantages for this region.

The Latgale region stands out with its employment concentration in the following activities: public administration, defence and compulsory social security (O), education (P), and human health and social work activities (Q), as well as agriculture (A), which makes for a relative advantage in terms of the regional specialisation. High employment specialization in the aforementioned industries may be explained by the underdevelopment of the region. On the one hand, the Latgale region is the least developed region in Latvia, with the highest unemployment rates (*Cross-sectoral Coordination Centre* 2013). On the other hand, it has the highest decrease in the number of inhabitants – on average by 2.08% per year, while in Latvia on average it is 1.21%; furthermore, in the Latgale region, there is the highest share of elderly people and the lowest share of people under working age (Kamola, Ivanova, and Kamols 2016). Such a situation and the government attempts to mitigate its negative effects resulted in the necessity of different types of health and social work activities. Regarding education, the Latgale region, specifically the city of Daugavpils, is the location of Daugavpils University, one of the notable universities in Latvia, and which attracts students not only from Latgale but from other regions and countries. This increases the number of people employed in education.

In general, the relative employment specialization of Latvian regions, in terms of employment concentration, varies according to the type of economic activities. However, agriculture (A) exists as an employment specialization in most Latvian regions, except Riga and Pieriga. The Riga region stands distinctly ahead of other regions with the highest rates of employment specialization in finance, trade and transportation-related activities. Furthermore, these spheres, especially trade-related activities, employ a significant share of the workforce. Industry and power engineering (B-E) in the Pieriga, Kurzeme and Zemgale regions, and construction (F) in the Pieriga, Kurzeme, and Vidzeme regions, also show employment specialization.

In addition, comparing our results with the results of Vanags, Basarova and Titova (2002) obtained about 15 years ago, we can conclude that the Riga region has maintained its major positions in the activities related to trade, hospitality and catering, finances and real estate, while it has lost its status as a manufacturing center because many factories and plants in Riga were closed during the transition period. Although the previous research results showed that the primary sector was more developed in Zemgale and Kurzeme, and to a lesser extent in Vidzeme, our research demonstrates that agriculture-related activities are also substantially represented in almost all regions, with the highest concentration in Vidzeme. The number of activities related to manufacturing, mining, quarrying and power engineering is especially high in Vidzeme, as well as in Zemgale and Latgale, which specialize in these activities, but recently Kurzeme has moved distinctly ahead. On the other hand, Kurzeme specialized in construction, while recently this industry has become typical not only of the Kurzeme region, but also of Vidzeme (to a greater degree), Zemgale and Pieriga. At the end of the nineties, public activities related to administration, medicine, education, etc., were the mostly localized in Latgale, Vidzeme and Zemgale. Currently, the localization of these activities remains the same, with a noticeable predominance of Latgale. Overall, the employment specialization of Latvian regions remains relatively permanent, with some noticeable changes in levels of concentration. Vanags, Basarova, and Titova (2002) provide a comparison of three Baltic countries and report that, in contrast to both Estonia and Latvia, in Lithuania any growth aureole around its capital Vilnius is not created, while economic activities at the national level are distributed rather evenly, where the differences between agricultural and heavily industrialized regions are clearly noted (Vanags, Basarova, and Titova 2002, 26).

Moreover, the observed changes in the degree of employment concentration (ΔLQ) in different types of

economic activity prove that the spatial localization of economic activities in Latvia is not a constant value but a dynamically developing indicator (Boronenko and Zeibote 2011, 49), and the results of this paper (Table 1, LQ level changes) are in line with this statement.

Other researchers (Boronenko and Zeibote 2011) provide evidence of the employment concentration across regions in Finland, which can be compared to Latvia. While Finland is considered to be a highly-clustered economy, and in almost all of its regions there is potential for cluster development and competitiveness (at least in some industries of the national economy), this is not the case in Latvia. Moreover, in Finland the degree of employment concentration in some industries and regions is two to four times greater (transportation, warehousing and communication) than the average level in the whole economy of Finland. In contrast, in only one Latvian region – Vidzeme – is the LQ in agriculture greater than 2. At the same time, even in Finland, whose level of economic development is obviously higher than that of Latvia, some regions also specialize in the primary sector (LQ values vary from 1.26 to 1.98), while other industries with relatively high levels of employment concentration include mining, industrial production and energy (LQ values from 1.32 to 1.47); finances, ICT, business services (LQ from 1.25 to 1.56), which are also concentrated near the capital of the country; and transportation, warehousing and communications (LQ from 4.04 to 4.52) (Boronenko and Zeibote 2011). To resume the comparison, Latvia has a lower degree of employment concentration in certain economic activities than Finland. Nevertheless, Kemeny and Storper (2015) also point out that it is not a higher level of specialization that makes a region rich and developed, but the type of industry it specializes in – which may also partially explain why the Riga region is more economically developed than others. As a result, it is claimed that Latvia failed to distinguish highly competitive and export-oriented industries within its national and regional structures upon which to concentrate its efforts and resources, and to promote the further development of these industries – that is mentioned as one of the major causes of the deep recession in Latvia in 2008-2010 (Skribane and Jekabsone 2013). In addition, Skribane and Jekabsone (2013) note that the structure of the national economy of Latvia, which was spontaneously formed by private investors, does not result in the increase of economic competitiveness of Latvia.

The findings presented in this subsection disclose regional disparities and emphasize the necessity of the planned development of national and regional economic structures. However, to answer the main research question of the paper, the authors provide the results of the further analysis of income and its changes across regions and industries in the following section.

4.2. Breakdown of income changes in Latvian regions

Table 2 displays the results on the breakdown of the changes in real average income (see Subsection 3.2) by the type of economic activity and in the statistical regions of Latvia from 2008 to 2016. The results in Table 2 are based on the authors` calculations using data compiled from the *Central Statistical Bureau of Latvia* on the number of employees and income, with a breakdown by the type of economic activity and region.

First, the data in Table 2 display an absolute change in the average income in the regions from 2008 to 2016. Second, the applied method reveals the extent to which each industry contributes to the change in the aggregate income of the region. Furthermore, it also displays whether these changes in the aggregate income in a certain industry and/or region occurred due to changes in the average real income (the income component) or because of changes in employment shares (the employment component).

In Table 2, the highest increase of the real average income is in the Riga region (by 82.25 Euros), and the lowest in the Kurzeme region (36.47 Euros). This growth in the Riga region is mostly due to the high positive changes in two sectors, financial and scientific activities (K-N) and transportation and ICT (H, J), which add to the average income of this region 75.36 and 44.26 Euros, respectively. At the same time, the most negative impact is from construction (F) (– 37.16 Euros), as well as industry and power engineering (B-E), and public activities (O), (19.03 and 18.6 Euros respectively). These effects appear largely due to higher and/or negative changes in the employment share.

In the Pieriga region the same activities as those of the Riga region facilitated the growth of its average income in 2016, while the negative effect also appeared because of the decrease of income in construction (F), public activities (O), education (P) and trade related activities (G, I), which reduced the average income level in the region.

In the Vidzeme and Zemgale regions, agriculture (A) and industry and power engineering activities (B-E) especially promote the increase of average income, which is principally due to the positive changes in the real average income (see also Figure 2). The reduction of the average income by public activities (O) is also common for these regions. Furthermore, in Vidzeme,

Table 2. Decomposition of the changes in the real average income by type of economic activity and statistical region of Latvia, in Euros

Type of activity	Income component	Employment component	Residual component	Total change in the real average income
1	2	3	4	5
Riga region				
(A)	0.38	3.60	0.19	4.17
(B-E)	20.56	**-33.11**	-6.49	-19.03
(F)	4.86	**-38.15**	-3.87	-37.16
(G, I)	17.70	-11.84	-1.89	3.97
(H, J)	17.54	**24.09**	2.64	44.26
(K-N)	16.87	**53.03**	5.46	75.36
(O)	-9.37	**-10.76**	1.54	-18.58
(P)	-5.79	**13.07**	-1.19	6.10
(Q)	-0.27	**13.86**	-0.08	13.52
(R-U)	6.26	2.82	0.58	9.65
Total				**82.25**
Pieriga region				
(A)	**4.20**	1.02	0.10	5.32
(B-E)	**11.61**	1.88	0.19	13.68
(F)	8.36	**-22.88**	-3.23	-17.76
(G, I)	10.97	**-13.83**	-1.57	-4.43
(H, J)	4.09	**17.62**	0.90	22.61
(K-N)	13.32	**29.54**	4.65	47.51
(O)	-3.44	**-9.27**	0.47	-12.24
(P)	**-5.42**	0.39	-0.03	-5.06
(Q)	0.27	4.08	0.03	4.38
(R-U)	**4.71**	-2.24	-0.37	2.09
Total				**56.10**
Vidzeme region				
(A)	**23.59**	-0.24	-0.07	23.28
(B-E)	**13.69**	4.95	0.69	19.34
(F)	**10.44**	-4.86	-0.89	4.69
(G, I)	**13.47**	**-13.45**	-3.37	-3.36
(H, J)	2.68	4.35	0.26	7.29
(K-N)	6.76	-5.39	-1.39	-0.02
(O)	-1.04	-3.31	0.06	-4.29
(P)	-8.59	9.32	-1.17	-0.45
(Q)	-2.90	**17.29**	-1.06	13.32
(R-U)	3.66	1.62	0.32	5.60
Total				**65.40**

Type of activity	Income component	Employment component	Residual component	Total change in the real average income
1	2	3	4	5
Kurzeme region				
(A)	6.06	**-9.37**	-0.90	-4.21
(B-E)	**23.86**	-19.57	-4.14	0.16
(F)	14.03	-5.90	-1.44	6.69
(G, I)	**12.79**	**12.90**	2.66	28.35
(H, J)	**12.92**	7.15	1.15	21.22
(K-N)	**-17.32**	**17.53**	-4.99	-4.78
(O)	-2.60	**-17.56**	0.96	-19.19
(P)	**-7.50**	4.49	-0.52	-3.53
(Q)	0.48	**9.74**	0.13	10.35
(R-U)	3.17	-1.51	-0.25	1.41
Total				**36.47**
Zemgale region				
(A)	**18.40**	16.13	3.53	38.06
(B-E)	**21.55**	3.37	0.63	25.55
(F)	6.20	**-32.46**	-4.43	-30.69
(G, I)	**19.26**	-1.46	-0.43	17.37
(H, J)	0.75	**9.86**	0.14	10.75
(K-N)	5.59	6.53	1.03	13.15
(O)	1.31	**-11.19**	-0.26	-10.15
(P)	**-11.55**	6.57	-1.16	-6.14
(Q)	-1.84	**15.40**	-0.66	12.90
(R-U)	3.14	**-7.00**	-1.64	-5.49
Total				**65.31**
Latgale region				
(A)	**17.34**	-3.04	-0.93	13.38
(B-E)	9.31	**-12.39**	-1.47	-4.55
(F)	2.61	**-12.57**	-1.00	-10.96
(G, I)	**14.69**	2.99	0.99	18.67
(H, J)	**13.70**	1.53	0.48	15.71
(K-N)	7.27	**13.21**	3.25	23.74
(O)	**-4.51**	**-18.27**	1.44	-21.34
(P)	**-9.76**	**9.77**	-1.26	-1.25
(Q)	-1.35	**11.73**	-0.33	10.05
(R-U)	**4.04**	1.91	0.50	6.45
Total				**49.90**

Source of raw data for authors` calculations: *Central Statistical Bureau of Latvia (accessed in 2017)*

the activities related to trade (G, I), as well as financial activities (K-N) and education (P) also display a negative impact, while in Zemgale those with a negative impact are construction (F) and education (P) (with a high negative effect from its employment component, rather than its income component) and other services (R-U).

In the Kurzeme and Latgale regions an increase in the average income is mainly connected with trade and related activities (G, I). In Kurzeme, which is considered a transportation and storage junction, activities related to transportation (H, J) significantly added to positive changes in average income, while in the Latgale region this was the case for the finance sector (K-N). Changes within activities related to the public sphere (O) and education (P) had a negative impact, as in other regions. Furthermore, in the Latgale region, construction (F) and, to a lesser degree, industry and power engineering (B-E), reinforce the negative impact on the average income in the region, while in the Kurzeme region a negative result arose from agriculture (A) and financial and related activities (K-N).

The three main sectors that most negatively impact changes in the average income in the regions are

activities related to the public sphere (O), education (P) and construction (F). The explanation might be that the research period involves the year 2008 – the beginning of the economic downturn in 2008-2010. For Latvia, this was a period of sharp decline in internal demand and income, resulting in extensive reforms in the public sector, and followed by a transformation of the education system, partially because of a decrease in the population (Kamola, Ivanova, and Kamols 2016). On the other hand, due to extensive budget reforms during the crisis of 2008-2010, the contraction of income in the public sector in Latvia was the largest, in comparison with the other Baltic states, though the decrease in income in construction was comparatively more modest than in Lithuania and Estonia, it nevertheless resulted in a substantial employment cuts in this sector (Masso and Krillo 2011).

4.3. Comparison of income by industry in Latvian regions

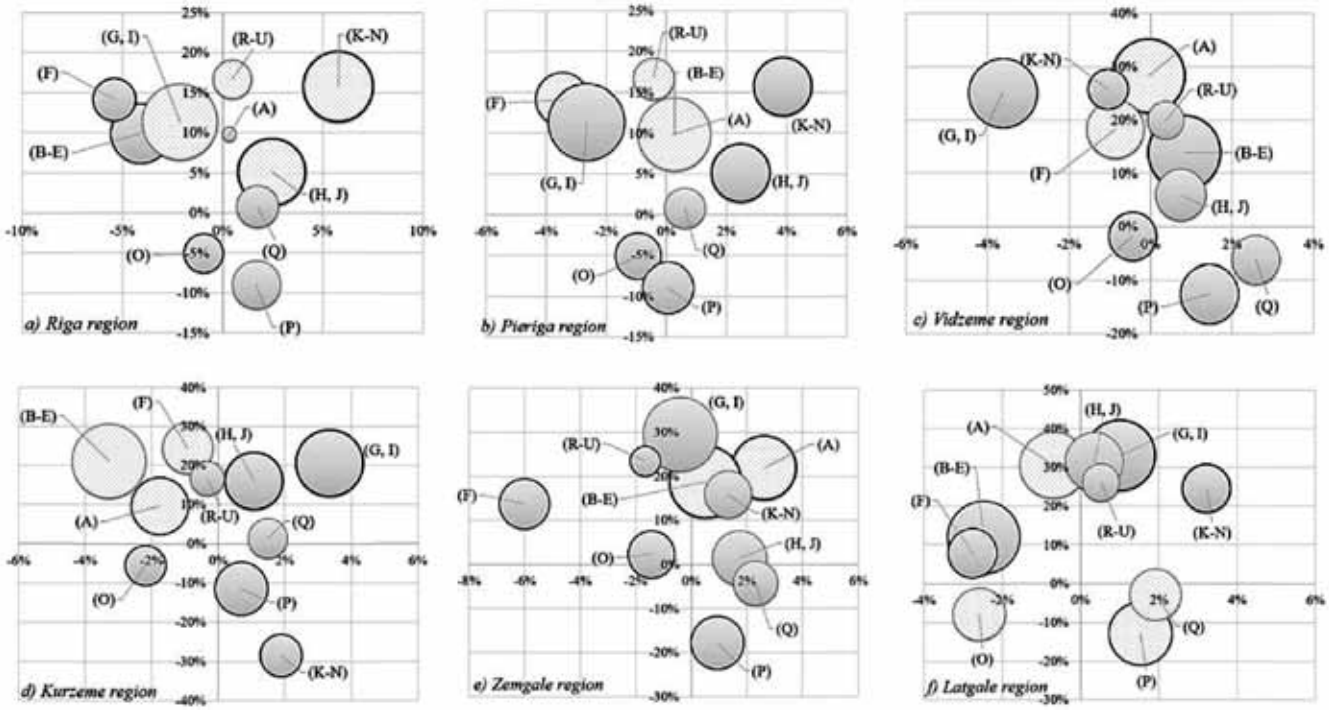
In this section, the authors further analyze changes in the real average income across Latvian regions in order to find out whether a shift of employees took place towards high-income, low-income, or both types of industries, and hence making an impact on regional differentiation. We first analyze the changes in average income and employment shares by industry. The results are presented in Figure 1.

During the period researched, the real average income increased in those economic activities where the regions have relative employment specialization or positions close to specialization (except Latgale, where growth was observed only in agriculture). These results are coincident with evidence from the US economy (Kemeny and Storper 2015), where findings display a positive relationship between employment specialization and income.

Figure 1 displays that in all types of economic activities across all Latvian regions the average income has increased since 2008, except the three sectors related to the public sphere (O), education (P) and health and social work activities (Q). On the one hand, the increase of income is positive. On the other hand, it is necessary to compare, first, the level of income in a certain industry with the average income at the regional level and, second, with the average income in this sector at the national level (see Figure 2).

Figure 2 displays that only in the Riga region is the average income in all economic activities higher than the average of the country. This is unsurprising because the Riga region is the most developed region in Latvia. In other regions, the average income in

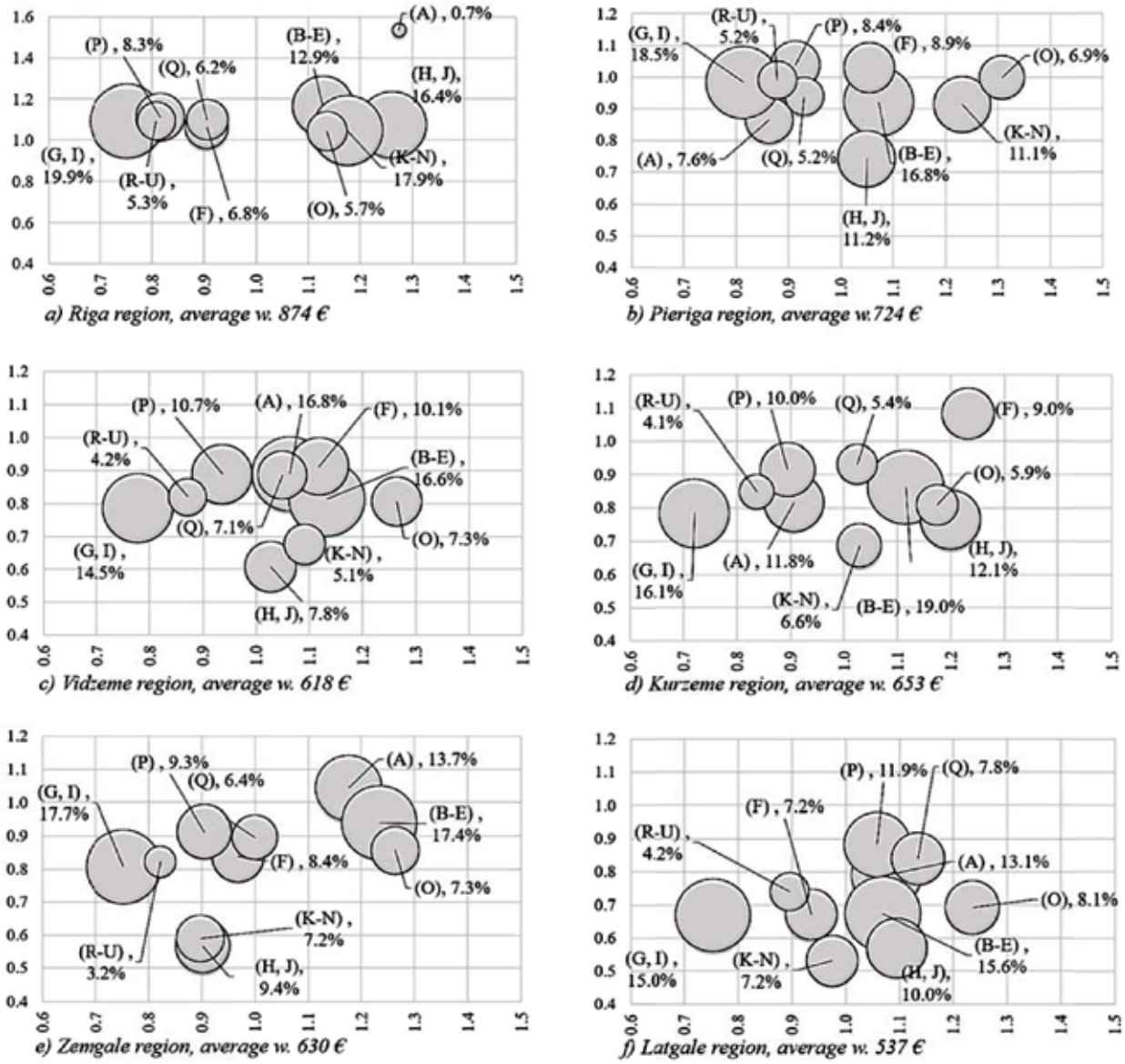
Figure 1. Absolute changes in employment shares (horizontal axis, in %p) and relative changes in real average income (vertical axis, in %) in Latvian regions from 2008 to 2016



Source of raw data for authors` calculations: *Central Statistical Bureau of Latvia (accessed in 2017)*

Pattern fill – specialization of a region; Dark border – negative impact on the changes in the average income in a region; Thick grey border – highly positive impact on the changes in the average income in a region; Size of bubbles represents employment shares in 2016.

Figure 2. Comparison of the real average monthly income (average wage) within 10 types of economic activities in Latvian statistical regions, 2016



Source of raw data for authors` calculations: *Central Statistical Bureau of Latvia (accessed in 2017)*

Values on the horizontal axis represent a comparison with the average regional income level, while on the vertical axis – a comparison with the national average income level in a certain economic activity; The size of bubbles represent employment shares in 2016.

different types of economic activity is lower than the average national level in the same type of economic activity. However, there were also observed some economic activities where income is higher than that of regional as well as national levels, for example, in the Pieriga region (construction (F), public administration, defence, and compulsory social security (O)), the Kurzeme region (construction (F) – based on data from the *Central Statistical Bureau of Latvia*, many construction-related enterprises come from this region, i.e. are registered there), and the Zemgale region (agriculture (A) – based on data from the *Latvian Rural Advisory and Training Centre*; Zemgale is the most productive land in Latvia).

Furthermore, regarding employment concentration and the average income level, in those economic activities where regions have employment specialization or positions near specialization, the average income is generally higher than the average income in the region, with some exceptions in the Riga region (trade related activities (G, I) and other services (R-U)), Pieriga (agriculture (A) and other services (R-U)), and Kurzeme (agriculture (A)).

Moreover, in the Riga region almost 54% of all employees in the region receive an income that is higher than the average of the region, in Pieriga – almost 55%, in Vidzeme – almost 71%, in Kurzeme – about 58%, in Zemgale – almost 45%, and in Latgale – about

67%. But it should be noted that in certain regions a large part of economic activities are low income activities (wage dispersion in Latvia is one of the highest across the EU (Magda et al. 2011)).

The results obtained in this research regarding the income differences between the industries of national and/or regional economies are consistent with evidence from Eastern and Western Europe – notable wage differences exist across industries of a national economy (Magda et al. 2011; Du Caju et al. 2010). In addition, Magda et al. (2011) and Du Caju et al. (2010) agree that the industries with the highest income are similar across European countries and are related to oil and gas extraction, nuclear power, chemicals, mining and quarrying, production and distribution of electricity/gas/water, air transport, finances and ICT, while the industries with the lowest income are traditional industries, including among others the clothing industry, woodwork, as well as trade, hospitality and catering activities. In Latvia, low-income industries (see Figure 2), in which the average income is below the average regional level, also include trade, hospitality and catering activities (G, I), as well as education (P) and other services (R-U), which are marked out particularly in all regions. Moreover, there is some evidence that the ranking of the best-worst paid industries remains persistent over time (Du Caju et al. 2010). The fluctuations of income level differences between industries vastly vary across European countries: they are more concentrated in such developed countries as Norway and Belgium, while, for example, in Latvia, Lithuania and Slovakia, dispersions are the highest (Magda et al. 2011). Therefore, this partly explains the substantial regional differentiation between Riga and other regions in employment distribution. Applying efforts to reducing these differences may help to lower regional differentiation.

Comparison of the data from Figure 1 and Figure 2 reveals that not all employment shifts between economic activities are towards employment types that provide higher income. Expanding the comparison to industries which demonstrated positive changes in the employment shares and where the average income increased within low- and high-income activities across regions, it becomes evident that during the research period in the Riga and Pieriga regions the shifts occurred not only towards high-income industries but also towards low-income activities. For more developed regions such a shift of employees may not have a large negative effect. At the same time, those regions that are below the average level of development may deteriorate even more. However, in the long run, such shifts may result in rather negative consequences, even for economically developed regions. The case in point are two regions of the USA. During the majority of the twentieth century, the Los Angeles region had the highest performing economy, while today, in terms of income, it is outpaced by a third by San Francisco. Therefore, Makarem, Storper and Kemeny (2015) claim that in order to promote development and to minimize regional differentiation it is necessary to engage in the "new economy" – to attract and support new high-cost and high-wage industries rather than develop and maintain low- and medium-wage jobs.

CONCLUSION

The findings obtained reveal an evident economic disparity between the Riga region and other statistical regions of the country, which remains rather persistent over time and one of the highest across the European Union. Furthermore, the structure of the national and regional economies has a negative impact on regional differentiation in the statistical regions of Latvia.

The analysis of employment distribution showed that employment specialization varied between Latvian regions during the period researched. According to the obtained results, the most characteristic employment specialization areas in the Latvian economy in general are agriculture, forestry and fishing (A), manufacturing, mining and quarrying, energy (B-E), and construction (F).

Riga region stands distinctly ahead of the other regions, with the highest rate of specialization in financial, trade and transportation activities. In addition, during the research period its regional specialization remained stable, showing only slight changes. In comparison to a more developed country, differentials appear in the level of specialization – Latvian regions did not reveal a rather strong level of specialization, which also may lower further development prospects; however, it also depends on which type of economic activity the region specializes in.

The results of the decomposition of changes in the received income revealed that mainly three sectors negatively impacted the changes in the average income level in Latvia – the activities related to the public sphere (O), education (P) and construction (F), which appeared to be more exposed to changes in economic conditions. While the largest positive effect of economic activities varied across regions, it was mainly related to agriculture (A) and industry and power engineering (B-E), or trade-related activities (G, I) in the less-developed regions. However, in the Riga and Pieriga regions it was largely connected with activities related to finance (K-N), transportation and ICT

activities (H, J), activities that were typical of the central regions.

In addition, in the Latvian statistical regions, the least financially-rewarding sectors were related to trade activities (G, I), education (P), and other services (R-U). These findings are partly in line with the results obtained in previous research.

Overall, during the researched period the regions mainly specialized in low-value-added activities, such as agriculture, which could facilitate neither regional development nor the growth of the population's income. On the other hand, the real average income slightly increased in these industries, and the average income in such industries was generally higher than the average level in the region. Nevertheless, in some regions, a large part of economic activities was insufficiently paid for, which could not promote the further development of the region. Furthermore, it should be noted that not all shifts of employees between economic activities are towards better-paid job types; some are also towards worse-paid job types. For the regions that are below the average level of development this may allow the situation to deteriorate further, while for such well-developed regions as Riga, over a short-term period, such shifts of employees may not have a large negative effect.

The authors conclude that the main purpose of this research, namely to find out whether changes in employment structure have an impact on regional differentiation, was achieved. The applied method of comparative statistical analysis allowed the authors to conduct the research, and the obtained results indicate that changes in the employment structure influenced regional differentiation in Latvia during the period researched.

Nevertheless, in further research it is necessary to analyze to a greater degree whether it is possible to reduce regional disparities by implementing structural changes, and which factors can facilitate this and to what extent. A more detailed analysis of the structure of national economy and the reasons for people's preferences for certain types of economic activities is recommended.

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DE GRUYTER OPEN

South East European Journal of Economics and Business
Volume 12 (2) 2017, 61-71
DOI: 10.1515/jeb-2017-0017

EXPLAINING INDIVIDUAL- AND COUNTRY-LEVEL VARIATIONS IN UNREGISTERED EMPLOYMENT USING A MULTI-LEVEL MODEL: EVIDENCE FROM 35 EURASIAN COUNTRIES

Besnik A. Krasniqi, Colin C. Williams

Abstract

The aim of this paper is to evaluate the individual- and country-level variations in unregistered employment. To analyse whether it is marginalised groups who are more likely to engage in unregistered employment and explain the country-level variations, a 2010 Life in Transition Survey (LiTS) involving 38,864 interviews in 35 Eurasian countries is reported. Multilevel logistic regression analysis reveals that younger age groups, the divorced, and those with fewer years in education, are more likely to be unregistered employed. On a country-level, meanwhile, the prevalence of unregistered employment is strongly associated with tax morale; the greater the asymmetry between informal and formal institutions, the greater is the prevalence of unregistered employment. It is also higher when GDP per capita as well as social distribution and state intervention (subsidies and transfers, social contribution expenditure, health expenditure) are lower. The paper concludes by discussing the theoretical and policy implications.

Keywords: *informal sector; tax morale, institutional theory; labour law; tax evasion; Europe.*

JEL classification: *H26, J46, K34, K42, O17, P2*

1. INTRODUCTION

Tackling unregistered employment is high on the political agenda both in Europe and beyond. This is exemplified by the European Commission establishing the European Platform Tackling Undeclared Work (European Commission 2016) and the International Labour Organisation passing Recommendation 208 (ILO 2015). The reason it is high on the political agenda is because the prevalence of employees without written contracts or terms of employment means not only that the state has reduced control over the quality of working conditions, but it also weakens trade union and collective bargaining, and it increases pressure on legitimate businesses to themselves employ unregistered workers due to the unfair competition they witness (Andrews, Sanchez, and Johansson 2011)

2011; Williams 2014). To advance understanding of this phenomenon, the aim of this paper is to evaluate the individual- and country-level variations in unregistered employment so as to provide a new way of explaining and tackling this employment relationship.

To do so, this paper draws upon theoretical developments in the study of the wider informal economy in order to evaluate the individual- and country-level variations in unregistered employment. On the hand, this paper evaluates at the individual-level the

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marginalisation thesis which asserts that populations marginalised from the formal labour market are more likely to engage in unregistered employment (see Williams and Horodnic 2015a,b,c). On the other hand, and to explain country-level variations, this paper follows the lead of recent developments in the study of the informal economy by drawing inspiration from institutional theory (Baumol and Blinder 2008; Helmke and Levitsky 2004; North 1990). This argues that all societies have formal institutions (i.e., codified laws and regulations) that define the legal rules of the game and informal institutions which are socially shared unwritten rules (Helmke and Levitsky 2004). When there is asymmetry between these formal and informal institutions, the result is the emergence of forms of work such as unregistered employment. If correct, then it suggests that reducing the commonality of this practice will require not simply the stronger enforcement of formal rules (e.g., by using effective workplace inspections), but also a new emphasis on the reduction of this institutional asymmetry, which will require changes in both informal and formal institutions. To determine the changes in formal institutions required, three theories are evaluated which have sought to explain the various country-level formal structural imperfections and failings that are argued to result in larger informal economies (Krasniqi, 2007; Krasniqi 2011; Williams 2013; Krasniqi and Mustafa 2016; Lajqi and Krasniqi 2017), namely: economic under-development and the lack of modernisation of government (modernisation thesis); too much state interference in social expenditure and redistribution (state over-interference thesis), or inadequate state intervention and protection of workers (state under-intervention thesis). Here, however, these structural conditions are more seen as ways of reducing institutional asymmetry rather than free-standing explanations.

Therefore, this paper makes following important contributions to the informal economy literature. Firstly, in the paper reveals some support for the marginalisation thesis in relation to unregistered employment, although it reveals that care is required when identifying which marginal groups are more likely to engage in unregistered employment. Secondly, by revealing the strong association between tax morale and participation in unregistered employment, it confirms the usefulness of an institutional theory framework. Thirdly, and importantly for advancing understanding of unregistered employment from an institutional theory viewpoint, the finding of this multi-level analysis (individuals within countries) is that the propensity to engage in unregistered employment is higher when the level of economic development is lower (confirming modernisation theory) and when the levels of social distribution and state intervention (subsidies and transfers, social contribution expenditure, health expenditure) are lower (confirming state under-intervention theory and refuting state over-interference theory). Finally, the paper contributes to literature by testing the hypothesis in a cross-country analysis in a sample of countries with varying degree of insertional reforms, thus making our findings stronger in terms of heterogeneity of sample.

The paper is structured as follows. To advance understanding on unregistered employment, section 2 briefly reviews the previous literature on unregistered employment and draws upon the study of the wider informal economy to develop hypotheses regarding the individual- and country-level variations. To test these hypotheses, section 3 then reports the data used, namely the 2010 Life in Transition Survey (LiTS) involving 38,864 interviews in 35 Eurasian countries, and the analytical methods employed; a multi-level logistic regression model utilizing the hierarchical nature of the data (individuals within countries). Section 4 reports the findings regarding the individual- and country-level variations in unregistered employment, while section 5 draws conclusions about the theoretical and policy implications of the findings.

2. *EXPLAINING UNREGISTERED EMPLOYMENT: THEORETICAL FRAMING AND HYPOTHESES DEVELOPMENT*

The informal economy, by which is here meant paid work that is not unregistered by, or not declared to, the authorities for tax, social security and/or labour purposes (Khan 2017; Slack et al. 2017; Williams 2017; Williams and Windebank 1998; Windebank and Horodnic 2017), has attracted the interest of both policymakers and academics in recent years. This stems from that fact that globally, 60 per cent of jobs globally are in the informal economy (Jütting and Laiglesia 2009) and that the informal economy is expanding relative to the formal economy in many global regions (ILO 2011; Williams 2014; Williams and Schneider 2016).

The informal economy includes not only paid work without a legal written contract (i.e., unregistered employment) but also other paid work not declared to the authorities. This includes formal employers not declaring some and/or all of the work they undertake and also under-declaring employment by paying some and/or all formal employees an official declared wage and an additional undeclared (envelope) wage (ILO 2015; Williams 2017b). Although the informal economy as whole has been subject to widespread

evaluation in recent years, unregistered employment has received little attention. The only exceptions are Hazans (2011) and Williams and Kayaoglu (2017), both of which evaluate its prevalence. Williams and Kayaoglu (2017) find that in the European Union, 5 per cent of employees reported that they did not have a written contract of employment in 2013, while Hazans (2011), using European Social Survey data on 30 countries for the period between 2004 and 2009, finds that the proportion of employees without a contract is 2.7% in Nordic countries, 9.5% in Southern Europe, and 5 per cent in Western and East-Central Europe.

The result is that not only are there few, if any, studies of the individual-level distribution of unregistered employment, but neither has there been any attempt to explain the country-level variations. To do so, therefore, theories used to explain the individual- and country-level variations in the broader informal economy can be used (Williams 2014; Williams and Horodnic 2016).

When theorising the informal economy at the individual level, a marginalisation thesis dominates, which argues that the informal economy is concentrated among populations marginalised from the formal labour market and social protection (Williams and Horodnic 2015a,b, c, 2017a). Until now, some limited evidence exists to support this marginalization thesis when studying the informal economy. Studies have shown informal employment to be concentrated among those more likely to be excluded from the formal labour market, including the unemployed (Brill 2011; Slavnic 2010; Taiwo 2013) and women (ILO 2013; Leonard 1994; Stănculescu 2004). However, other studies reveal that the unemployed are not more likely to participate (Williams 2001), and that men are more likely to participate (Lemieux, Fortin, and Frechette 1994; McInnis-Dittrich 1995). Indeed, a recent evaluation of this marginalisation thesis in relation to the informal economy across the European Union reveals that although valid when discussing younger people, it is not when considering those with fewer years in education, women and the unemployed (Williams and Horodnic 2015b). Meanwhile, and in relation to undeclared employment (i.e., where formal employees are paid an official declared wage and an additional undeclared 'envelope' wage so that employers evade paying their full tax and social contributions), the finding has been that this is more likely among younger persons, men, divorced people (doubtless to hide their level of income), and unskilled manual workers (Williams and Horodnic 2017b), suggesting again that some marginal populations are more likely to be engaged in the informal economy but not others.

The only known studies of the distribution of unregistered employment similarly find partial support for the marginalisation thesis. Although Williams and Kayaoglu (2017) find no significant association between various socio-demographic and socio-economic factors (i.e., gender, age, educational level, and occupational status) and the probability of unregistered employment, Hazans (2011) finds that the likelihood of unregistered employment is inversely related to education level, students more likely than other occupational groups, older and younger employees more likely, and women more likely than men to work without a contract. Based on these findings from the study of the informal economy in general, and the only two studies of unregistered employment, regarding the relevance of the marginalisation thesis when explaining its distribution, we can therefore here test the following propositions:

Individual-level marginalisation hypothesis (H1)

H1a*:* Women are more likely to participate in unregistered employment than men.

H1b: Younger age groups are more likely to participate in unregistered employment than older age groups.

H1c: Those divorced or separated are more likely to participate in unregistered employment than married individuals.

H1d: Those with fewer years in formal education are more likely to participate in unregistered employment than those who spent longer in formal education.

H1e: Homeowners are less likely to participate in unregistered employment than those renting or paying a mortgage.

Turning to country-level variations, it is again the case that theories of the wider informal economy can be used to explain cross-national variations in the prevalence of unregistered employment. In recent years, a new umbrella theorisation, drawing inspiration from institutional theory (Baumol and Blinder 2008; North 1990), has emerged to explain individual- and country-level variations in the informal economy (Williams and Horodnic 2015a,b,c). This could be also used to explain unregistered employment. From this institutionalist perspective, all societies have formal institutions, which are codified laws and regulations that define the legal rules of the game, and informal institutions, which are the 'socially shared rules, usually unwritten, that are created, communicated and enforced outside of officially sanctioned channels' (Helmke and Levitsky 2004: 727). According to the institutional theory research, asymmetries between formal and informal institutions can have negative

impact on economic development (Williams and Vorley 2015; Krasniqi 2014). Literature argues that formal and informal institutions interact in two key ways, with formal institutions either supporting (i.e. complementing) or undermining (i.e. substituting) informal institutions (Williams et al. 2017; Tonoyan, Strohmeyer, and Habib 2010; Krasniqi and Desai 2016; Hashi and Krasniqi 2011). Informal institutions can complement formal institutions if they create incentives to comply with the formal institutions, thereby addressing problems of social interaction and coordination and enhancing the efficiency of formal institutions (Baumol 1990; North 1990). Similarly, labour law violations, such as engaging in unregistered employment thus arise when there is a gap between the formal institutions and informal institutions. When this gap is large, the prevalence of unregistered employment will be higher (cf. Kistruck et al. 2015; Webb et al. 2009). The greater the degree of asymmetry between formal and informal institutions, the more prevalent will be unregistered employment (cf. Williams and Horodnic 2015a,b). Here, therefore, and to test this explanation for country-level variations, the following proposition can be tested:

Institutional asymmetry hypothesis (H2): The greater is the asymmetry between formal and informal institutions, the greater is the prevalence of unregistered employment.

What, however, causes the existence of this asymmetry? Much of the existing literature asserts that it is country-level formal institutional imperfections and failures that lead populations' norms, values and beliefs not to be in symmetry with the codified laws and regulations. In the study of the informal economy, three alternative theories exist that seek to explain the country-level formal structural imperfections and failings that result in larger informal economies (Williams 2013).

Firstly, a 'modernisation' thesis has argued that the informal economy becomes less prevalent with economic development and the modernisation of government which leads to a reduction in public sector corruption (Lewis 1959; Packard 2007). Applying this to the cross-national variations in unregistered employment, this perspective would thus view unregistered employment as more prevalent in less developed economies, measured in terms of GDP per capita, and societies in which there is a lack of modernisation of the state bureaucracy. To explore its validity, therefore, the following hypothesis can be tested:

Modernisation hypothesis (H3): Unregistered employment will be less prevalent in wealthier and more modernised economies.

- H3a: Unregistered employment will be less prevalent in wealthier economies
- H3b: Unregistered employment will be less prevalent in societies with stronger legal rights.
- H3c: Unregistered employment will be less prevalent in societies with lower levels of corruption.

Secondly, a 'state over-interference' thesis asserts that the informal economy is the result of high taxes and too much state interference in the free market and that reducing taxes and state interference in work and welfare arrangements is the way forward (De Soto 1989, 2001; London and Hart 2004; Nwabuzor 2005; Schneider and Williams 2013). From this perspective therefore, unregistered employment will be more prevalent in countries with higher taxes and levels of state interference in work and welfare systems. To explore the validity of this explanation in consequence, the following hypothesis can be tested:

State over-interference hypothesis (H4): unregistered employment will be less prevalent in economies with lower levels of state-interference.

Third and finally, and inverse to the 'state over-interference' thesis, a 'state under-intervention' thesis claims that the informal economy results from inadequate levels of state intervention in work and welfare arrangements which leaves workers less than fully protected. The focus therefore should be upon introducing social protection for workers, reducing inequality and pursuing labour market interventions to help vulnerable groups (Castells and Portes 1989; Davis 2006; Gallin 2001; ILO 2014; Slavnic 2010; Taiwo 2013). In consequence, unregistered employment from this perspective will be less prevalent in countries with relatively high levels of state intervention in work and welfare arrangements. To evaluate the validity of this explanation therefore, the following hypothesis can be tested:

State under-intervention hypothesis (H5): Unregistered employment will be less prevalent in economies with greater state intervention

3. DATA AND VARIABLES

3.1 Data and sample

To evaluate these hypotheses in relation to Eurasian countries, data is here reported from the second round of the Life in Transition Survey (LiTS II), conducted

jointly by the World Bank and the European Bank for Reconstruction and Development (EBRD) in 2010 (for details see EBRD 2011; Williams and Krasniqi 2017). The survey covers 35 Eurasian countries with varying degrees of economic development, including transition and developed economies[1]. The survey coverage has been expanded to include five western European "comparator" countries (France, Germany, Italy, Sweden and the UK) 'allowing us to benchmark the transition region against some advanced market economies, thereby giving a clearer perspective on the remaining challenges facing transition countries' (EBRD 2011, p.2).

In each country, a nationally representative sample of between 1000-1500 households was selected for face-to-face interviews, depending on the size of the country. The advantage of the LiTS is that it builds on a consistent sampling methodology across countries. Within each household the head of household was interviewed about individual and household characteristics, and the 'last birthday' rule was applied to randomly choose the household member (who could also be the household head) for the remaining modules of the survey. The standard approach to sample design in each country was multi-stage random probability stratified clustered sampling. The sample was stratified by geographical region and the level of urbanity. To aid the development of the questionnaire, two rounds of piloting were conducted.

The questionnaire enables a detailed analysis of how people across the region perceive the impacts of transition on their lives and their attitudes towards transition issues in general. The survey contains specific questions on peoples' economic status and for those employed, whether they have written work contracts or not. The survey also contains information about their attitudes towards paying taxes as well as their individual (gender, age, marital status, education) and household characteristics (owning or renting a house). In addition to the results of this survey, the original database has been here combined with country-level indicators from the World Bank such as GDP per capita, government spending, health expenditures, corruption perception index, and strength of the legal rights system. The country level indicators enable an evaluation of the explanations for the country-level variations in unregistered employment, including the influence of tax morale (as a proxy indicator of the degree of institutional asymmetry), which is becoming a very popular strand in recent research (Krasniqi and Desai 2016; Williams and Krasniqi 2017, Williams and Martínez 2014, Williams and Horodnic 2017b).

3.2 Variables

To analyse the above hypotheses, the dependent variable is a dichotomous variable extracted from the LiTs II (2010) survey based on the following question: " Do you have a written contract or a labour book for this job?". For the purposes of multi-level logit estimation, the dependent variable takes values of 1 when the answer is No, and 0 otherwise.

To analyse the hypotheses regarding the levels of unregistered employment across socio-demographic and socio-economic groups, the following individual-level variables are analysed to test hypotheses H1a-1e and H2:

- *Tax morale*: a dummy variable with value of 1 if individual has answered - seriously wrong and wrong, and 0 otherwise from the following question: "how wrong if at all, do you consider the following behaviour: paying cash with no receipts to avoid paying VAT or other taxes: not wrong at all, a bit wrong, wrong, and seriously wrong"
- *Gender*: a dummy variable with value 1 for males and 0 for females.
- *Age*: a continuous variable for the age and its squared term.
- *Marital status*: a categorical variables for the marital status of the respondent with value 1, for singles, for those separated or divorced, widowed, and value 0 for reference base category for married individuals.
- *Number of Children***:** it is a continuous variable for the number of children below in the household.
- *Household ownership***:** a categorical variable for the home ownership status of the respondent, with value 1 for those who are paying the mortgage or rent a house, and zero for those who own outright a house as a reference base category.
- *Education***:** a categorical variable for the educational level with value of 1 for primary and secondary education, and zero for university or postgraduate education as a reference base category.

To analyse hypotheses H3-H5, we examine the country-level variables deemed important in each

1 Countries included in the sample Albania, Armenia, Azerbaijan, Estonia, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, France, Georgia, Germany, Great Britain, Hungary, Italy, Kazakhstan, Kosovo, Kyrgyzstan, Latvia, Lithuania, Macedonia, Moldova, Mongolia, Montenegro, Poland, Romania, Russia, Serbia, Slovakia, Slovenia, Sweden, Tajikistan, Turkey, Ukraine, and Uzbekistan.

explanation. To do this, we here use data from the World Development Indicators database from 2010 and Transparency International (2014). To evaluate the modernisation hypotheses H3a, H3b and H3c, the respective indicators used are as follows:

- *GDP per capita* in purchasing power standards (current international $). For the purposes of testing for a nonlinear relationship with tax morale, we constructed GDP per capita squared.
- *Strength of legal rights index*. Strength of legal rights index measures the degree to which collateral and bankruptcy laws protect the rights of borrowers and lenders and thus facilitate lending. The index ranges from 0 to 12, with higher scores indicating that these laws are better designed.
- *CPI (corruption perception index)*. Public sector corruption perceptions index, which scores countries on a scale from zero to 10, with zero indicating high levels and 10 low levels of perceived public sector corruption.

To evaluate the contrary 'state over-interference' and 'state under-intervention' hypotheses (H3 and H4), meanwhile, the indicators used to measure the level of social redistribution, and state intervention and expenditure, are:

- *Subsidies and other transfers (% of expense)*. Subsidies, grants, and other social benefits include all unrequited, nonrepayable transfers on current account to private and public enterprises; grants to foreign governments, international organizations, and other government units; and social security, social assistance benefits, and employer social benefits in cash and in kind.
- *Social contributions (% of revenue)*. Social contributions include social security contributions by employees, employers, and self-employed individuals, and other contributions whose source cannot be determined. They also include actual or imputed contributions to social insurance schemes operated by governments.
- *Health expenditure per capita* as a percentage of GDP per capita

4. MULTI-LEVEL MODELLING

Given the hierarchical structure of the data, with individuals nested within countries, for the econometric analysis we use a series of multilevel models. As the dependent variable is a binary variable taking a value of 1 if the respondent declared that s/he is working without contract, and 0 otherwise, we employ mixed-effects logistic regression (Snijders and Bosker 2011, Hamilton 2012). The likelihood-ratio test that there is no cross-country variation in unregistered employment can be safely rejected in baseline model as well as in all other models. This means that the mixed-effects logistic regression should be used. In the first stage of the analysis, a baseline random model with no explanatory variables was estimated to test whether a multilevel approach was appropriate for this analysis. The analysis shows that 8-12 per cent of the variance in participation in unregistered employment was accounted for at the country level (see ICC in Table 2). Random intercepts in the output above exhibit significant variation, judged by a likelihood-ratio test versus an ordinary logistic regression (p = 0.000), or by the standard deviation of random intercepts (0.668) being much more than its standard error (0.082) (baseline Model 0). The Model 1 includes socio-demographic variables, while in Model 2 to Model 9 in sequence order country level indictors have been introduced.

Altogether, the seven models introducing these contextual variables (M2-5) improve significantly the explanatory power of models. Yet, the interclass correlation has only lowered to 8.2 (model 6) per cent from the initial 11.9 per cent of the baseline (M0 model). The ICC still indicates that 8.2 per cent of the variation in participation in unregistered employment due to country level differences across the countries in our sample remains unexplained. The country level characteristics we consider to test our hypotheses only account for 2 per cent of the country level variation in unregistered employment. Cleary, there may be other country level factors that we do not consider here that may explain the differences. The final logit intercept model including both individual level explanatory variables and country-level explanatory variables takes the following form (see Steele 2009; Williams and Horodnic, 2017a):

$$\log\left(\frac{\pi_{ij}}{1-\pi_{ij}}\right) = \beta_0 + \beta_1 X_{ij} + \beta_2 X_j + u_j$$

where, β_0 is the overall intercept, β_1 is the cluster specific effect, β_2 is the contextual effect, X_{ij} is the vector containing individual level explanatory variables, X_j is the vector containing country level explanatory variables and u_j is the group (random) effect.

5. RESULTS

To evaluate firstly, whether the association between tax morale and participation in unregistered employment is significant when other characteristics are taken into account and held constant (H1),

Table 1: Multilevel Mixed-Effects Logistic Regression of Participation in Unregistered Employment

VARIABLES	M0	M1	M2	M3	M4	M5	M6	M7
Tax morale		-0.162***	-0.162***	-0.162***	-0.163***	-0.166***	-0.217***	-0.146***
		(0.0368)	(0.0368)	(0.0368)	(0.0368)	(0.0410)	(0.0438)	(0.0372)
Gender (male)		0.660***	0.660***	0.660***	0.660***	0.575***	0.560***	0.647***
		(0.0341)	(0.0341)	(0.0341)	(0.0341)	(0.0387)	(0.0414)	(0.0346)
Age		0.0950***	0.0951***	0.0950***	0.0953***	0.0786***	0.0713***	0.0964***
		(0.00724)	(0.00724)	(0.00724)	(0.00724)	(0.00798)	(0.00855)	(0.00734)
Age squared		-0.00126***	-0.00126***	-0.00126***	-0.00126***	-0.00108***	-0.00100***	-0.00128***
		(8.11e-05)	(8.11e-05)	(8.11e-05)	(8.11e-05)	(8.80e-05)	(9.42e-05)	(8.21e-05)
Marital status (RC: Married)								
Single		0.0674	0.0695	0.0670	0.0702	0.0707	0.123**	0.0700
		(0.0485)	(0.0485)	(0.0485)	(0.0485)	(0.0542)	(0.0568)	(0.0493)
Divorced/separated		0.109*	0.110*	0.109*	0.111*	0.127*	0.183***	0.111*
		(0.0613)	(0.0613)	(0.0613)	(0.0613)	(0.0662)	(0.0691)	(0.0614)
Widowed		-0.340***	-0.341***	-0.340***	-0.341***	-0.435***	-0.449***	-0.339***
		(0.0855)	(0.0855)	(0.0855)	(0.0855)	(0.0925)	(0.103)	(0.0856)
No of children		-0.0195	-0.0198	-0.0196	-0.0203	-0.0716***	-0.0744***	-0.0161
		(0.0178)	(0.0178)	(0.0178)	(0.0178)	(0.0219)	(0.0243)	(0.0182)
Home ownership (RC owner)								
Rented		0.00790	0.0138	0.00872	0.0152	-0.0101	-0.0245	0.00775
		(0.0543)	(0.0543)	(0.0543)	(0.0544)	(0.0584)	(0.0607)	(0.0547)
Paying mortgage		0.00481	0.0146	0.00564	0.0138	0.0158	0.0292	0.00141
		(0.0724)	(0.0726)	(0.0724)	(0.0727)	(0.0753)	(0.0763)	(0.0732)
Education (primary RC)								
Secondary		0.189***	0.188***	0.189***	0.187***	0.148**	0.115	0.164**
		(0.0622)	(0.0622)	(0.0622)	(0.0621)	(0.0703)	(0.0714)	(0.0640)
University		-0.170**	-0.171**	-0.170**	-0.174**	-0.116	-0.0205	-0.194***
		(0.0728)	(0.0728)	(0.0728)	(0.0727)	(0.0810)	(0.0829)	(0.0742)
Country-level indicators								
Corruption Perception Index			-0.114*					
			(0.0619)					
Strength of legal rights index				0.000135				
				(0.000103)				
GDP per capita					-9.04e-05***			
					(2.94e-05)			
GDP per capita squared					1.67e-09***			
					(6.46e-10)			
Subsidies and other transfers (% of revenue)						-0.0244**		
						(0.0110)		
Social contributions (% of revenue)							-0.0192*	
							(0.00995)	
Health expenditure, total (% of GDP)								-0.000201**
								(9.93e-05)
Constant	-2.139***	-3.862***	-3.402***	-3.876***	-3.270***	-2.072***	-2.821***	-3.602***
	(0.115)	(0.203)	(0.319)	(0.203)	(0.262)	(0.670)	(0.386)	(0.240)
Observations	38,864	36,263	36,263	36,263	36,263	30,049	28,276	35,198
Number of groups	35	35	35	35	35	29	27	34
Identity: country (Variance constant)	0.668	.673	.642	.668	.583	.656	.542	.642
ICC	0.119	.121	.111	.119	.093	.115	.082	.111
LR Test	1601***	1426***	1305***	1402***	1060***	1089***	583***	1210***

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

secondly, whether various marginalised groups are more likely to engage in unregistered employment (H2), and third and finally, the validity of the contrasting explanations for the cross-national variations in the prevalence of unregistered employment (H3-5), we here report the results of a multilevel logistic regression model, which utilises the hierarchical nature of the data (individuals within countries).

Examining whether there is a significant association between tax morale and participation in unregistered employment, this is found to be the case across all models (confirming H1). This reinforces previous work on this subject with regard to the wider informal economy (Williams and Franic 2015; Williams and Horodnic, 2015a,b,c, 2017; Williams et al. 2015) which has used tax morale as a proxy for the degree of institutional asymmetry. It displays that the greater the degree of institutional asymmetry, the greater is the prevalence of unregistered employment.

To evaluate the marginalisation thesis that unregistered employment is concentrated among populations marginalised from the formal labour market and social protection we introduce series of econometric models. Model 1 in Table evaluates the relationship between various socio-demographic and socio-economic characteristics and the likelihood of participation in unregistered employment. This shows that everything else being equal, men are more likely to participate in unregistered employment than women (refuting hypothesis 2a). Instead, it reveals how the exclusion of women from the formal labour market is further compounded when examining unregistered employment. It also reveals, similar to previous studies (European Commission 2014; Williams and Horodnic 2016) that younger age groups seem to have higher levels of participation in unregistered employment due to their greater exclusion form the formal labour market (confirming hypothesis 2b). However, it also reveals an inverted U-shaped relationship between age and unregistered employment, suggesting that participation in unregistered employment increase with age up to certain level and then decreases as age increases. It is also the case that divorced tend to have higher probability of engaging in unregistered employment compared with the reference group of married people (confirming H2c), while the widowed have less likelihood of participating in informal work. There is no relationship, however, between home ownership and those paying a mortgage and renting house, and participation in unregistered employment (refuting H2d), although educational level is important. Individuals with secondary education are more to engage in unregistered employment and those with university education less likely, to engage in unregistered employment (confirming H2e).

To test H3-5 regarding the explanations for the cross-national variations in the prevalence of unregistered employment, and given that these country-level variables are strongly correlated (see Table A1 in the Appendix), sequential models are applied to provide alternative perspectives on the cross-national variations in the prevalence of unregistered employment.

Starting with the modernisation thesis, model 2 reveals that for the index of perceived public sector corruption, coded in a way where higher values mean lower levels of perceived public sector corruption, the lower is the perception of public sector corruption, the lower is the prevalence of unregistered employment (confirming H3b). However, model 3 identifies no significant association between the strength of legal rights and the prevalence of unregistered employment (refuting H3c). In model 4, meanwhile, a significant U-shaped relationship is identified between unregistered employment and GDP per capita. That is, the higher the level of economic development as measured by GDP per capita is, the lower is the prevalence of unregistered employment, but this effect holds only after GDP per capita has reached some minimum level (confirming H3a), thus supporting the modernisation thesis.

Turning to the state over-interference versus the state under-intervention theses, a positive and statistically significant relationship is found for the two measures of social redistribution, namely subsidies and other transfers in model 5, and social contribution expenditure in model 6, as well as for one measure on the expenditure side of government, namely health expenditure in model 7. The greater the state intervention and the greater the state expenditure on social redistribution, the lower is the prevalence of unregistered employment, thus supporting the state under-intervention thesis that unregistered employment will be less prevalent in economies with higher levels of state expenditure (confirming H5) and negating the state over-interference thesis that unregistered employment will be more prevalent in economies with higher levels of state expenditure (refuting H4).

DISCUSSION AND CONCLUSIONS

To evaluate whether unregistered employment is more likely to be conducted by marginalised populations, this paper has revealed that that younger age groups, the divorced, and those with fewer years in education, are more likely to be unregistered employed. However, women and those not owning their own household are not more likely to do so. On a

country-level, meanwhile, the prevalence of unregistered employment is strongly associated with tax morale; the greater the asymmetry between informal and formal institutions, the greater is the prevalence of unregistered employment. It is also higher when GDP per capita as well as social distribution and state intervention (subsidies and transfers, social contribution expenditure, health expenditure) are lower.

In terms of theoretical advances therefore, this paper makes three major contributions. Firstly, it reveals some support for the marginalisation thesis in relation to unregistered employment, although it reveals that care is required when identifying which marginal groups are more likely to engage in unregistered employment. Secondly, by revealing the strong association between tax morale and participation in unregistered employment, it confirms the usefulness of an institutional theory lens. The greater the degree of asymmetry between the codified laws and regulations of formal institutions and the norms, values and beliefs of citizens that constitute the informal institutions, the greater is the prevalence of unregistered employment. Thirdly, and importantly for advancing understanding of unregistered employment from an institutional theory viewpoint, the finding of this multi-level analysis (individuals within countries) is that the propensity to engage in unregistered employment is higher when the level of economic development is lower (confirming modernisation theory) and when the levels of social distribution and state intervention (subsidies and transfers, social contribution expenditure, health expenditure) are lower (confirming state under-intervention theory and refuting state over-interference theory).

In terms of policy implications therefore, the finding is that reducing the prevalence of unregistered employment will require a new emphasis on the reduction of institutional asymmetry, which will require changes in both informal and formal institutions. To determine the changes in formal institutions required, this paper has revealed that there needs to be a focus upon not only awareness raising to change attitudes norms and beliefs but also the formal institutional failings and imperfections that lead to this asymmetry, namely by increasing the level of GDP per capita and importantly, increasing spending on social distribution and state intervention (subsidies and transfers, social contribution expenditure, health expenditure).

There are, however, limitations to this study and what is known. It is not currently known how the working conditions of those engaged in unregistered employment differ to their equivalents in registered employment, nor their motives for engaging in such employment. Until this is evaluated, the evidence-base on the implications of unregistered employment will remain unknown. Moreover, only a limited range of country-level structural conditions associated with unregistered employment have been evaluated, albeit selected based on existing theoretical positions. Future research might evaluate a wider range of country-level structural conditions, albeit from a similar theoretically-driven perspective from the emergent understanding of this form of work. It would also be useful to know whether similar findings are identified in other global regions as has been identified across these 35 Eurasian countries.

In sum, this paper has revealed the individual- and country-level variations in unregistered employment, revealing that unregistered employment is concentrated among marginal groups and that it is more prevalent in countries where the degree of asymmetry between formal and informal institutions is greater, and where there are lower levels of GDP per capita and lower levels of social distribution and state intervention. If this stimulates further research on unregistered employment both to develop a more in-depth understanding and to test whether similar findings are identified in other global regions, then it will have fulfilled one of its intentions. If this then leads to a reconsideration of how unregistered employment is tackled, and to greater emphasis being put on tackling the formal institutional imperfections and failings that lead to this institutional asymmetry, and thus higher levels of unregistered employment, then it will have fulfilled its wider intention.

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APPENDIX

Table A: Correlations amongst the Country Level Variables

	Variables	Corruption Perception Index	Strength of the legal rights index	GDP per capita	GDP per capita squared	Subsidies and other transfers (% of revenue)	Social contributions (% of revenue)	Health expenditure, total (% of GDP)
1	Corruption Perception Index	1.000						
2	Strength of the legal rights index	0.268***	1.000					
3	GDP per capita	0.837***	-0.013*	1.000				
4	GDP per capita squared	0.788***	-0.002	0.966***	1.000			
5	Subsidies and other transfers (% of revenue)	0.190***	0.090***	0.213***	0.142***	1.000		
6	Social contributions (% of revenue)	0.290***	-0.186***	0.240***	0.089***	0.616***	1.000	
7	Health expenditure, total (% of GDP)	0.816***	-0.004	0.969***	0.908***	0.260***	0.360***	1.000

* p<0.05, ** p<0.01, *** p<0.00

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South East European Journal of Economics and Business
Volume 12 (2) 2017, 73-84
DOI: 10.1515/jeb-2017-0019

HOW DID RAPID CREDIT GROWTH CAUSE NON-PERFORMING LOANS IN THE CEE COUNTRIES?

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Abstract

This paper investigates the influence of three types of credit growth on non-performing loans in eleven Central and Eastern European countries during the period from 1999 to 2013. As opposed to previous research on credit risk, we have moved the focus from the usually investigated bank-specific and macroeconomic variables to different types of credit growth from earlier periods. At the same time, the results of this research give answer on the studies before the crisis, which tried to determine the possible consequences of rapid credit growth in the CEE countries. The results indicate that at least two years are necessary for each type of credit growth to increase credit risk. Finally, empirical results confirm the importance of both bank-specific and macroeconomic variables.

Keywords: *Credit Growth, Non-Performing Loans, CEE countries, Dynamic Panel Data*

JEL classification: *G21, G32, C23*

1. INTRODUCTION

Considering rapid credit growth in Central and Eastern European (CEE) countries before the crisis and more intensive increase of non-performing loans (NPLs) during the crisis in these countries in comparison to other European countries, motivated us to investigate the influence of rapid credit growth on credit risk in the CEE countries. Before the financial crisis, rapid credit growth in the CEE countries was a very intriguing research topic (Pazarbasioglu et al. 2005; Backé and Égert 2006; Backé et al. 2007). The stated authors concluded that rapid credit growth which is not followed by economic growth can cause macroeconomic and financial instability and endanger asset quality in the future.

However, at that time it was not possible to find empirical evidence on the relationship between credit growth and credit risk. The emergence of the crisis and rise of NPLs increased the interest for analyzing the determinants of credit risk in the CEE countries. Most of the research papers focus on macroeconomic and/or bank-specific determinants of NPLs (Cerutti et al. 2010; Jakubík and Reininger 2013; Klein 2013; Tanasković and Jandrić 2015) while credit growth is still not recognized as one of the key determinants. Several research studies considered certain indicators of credit growth as control variables but the results

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vary with the indicator used and with the number of lags as well.

However, the problem of rapid credit growth and bank system stability is not a problem which is specific only for the CEE countries, but it also exists in other developing and developed countries. To preserve the stability of the bank system, the Basel Committee on Banking Supervision (2010) provided guidance for national authorities on how to use a buffer of capital to protect the banking sector from periods of excess aggregate credit growth that had often been associated with the buildup of system-wide risk. They proposed the credit-to-GDP gap as a useful common reference point for taking buffer decisions. This document additionally motivates researchers to evaluate the countercyclical capital buffer proposal. On the one hand, Derhmannn and Gambarcorta (2012) in a simulation study confirmed that buffer decision by using the credit-to-GDP gap could help to reduce credit growth during the booms and attenuate the credit contraction once it is released. On the other hand, Repullo and Saurina (2011) critically assessed the countercyclical buffer, which is based on the credit-to-GDP gap indicator. They found weaknesses of the credit-to-GDP gap indicator and they proposed GDP growth as a more suitable indicator of capital buffer decisions.

Nevertheless, only a few papers have attempted to seriously investigate the relationship between the lagged value of credit growth and bank credit risk. Jiménez and Saurina (2006) found that four years were necessary for rapid credit growth to increase the level of NPLs in Spain while Foos et al. (2010) found that three years were necessary for abnormal loan growth to increase loan loss provisions in 16 developed countries. Their results give us an additional argument to determine which time period is necessary for credit growth to lead to an increase of NPLs in the CEE countries.

Considering the results of previous empirical research, this research includes micro and macro determinants of credit risk with a special focus on lagged credit growth as a cause of NPLs. Considering different indicators of credit growth used in previous research, this research considers three different types of credit growth which indicate different bank strategies. Hence, the central aim of this research is to give an answer to the following questions: How did rapid credit growth cause NPLs in the CEE countries? and how many years does it take for credit growth to influence NPLs? The recent financial crisis caused a strong increase of NPLs in the last few years which created an interesting economic situation and provided us with an opportunity to test the impact of rapid credit growth on credit risk in the CEE countries. The research is based on a dynamic panel analysis of the macroeconomic data and bank level data from the Bankscope database for 237 banks from 11 CEE countries, EU members, for the period from 1999 to 2013.

This study contributes to previous research on credit risk in several ways. Firstly, the empirical literature on the relationship between rapid credit growth and credit risk is rare. Secondly, the research period includes a period of credit growth and a period of growth of NPLs that enables us to find the relationship between credit cycles and credit risk in the CEE countries. Thirdly, most of the related studies for the CEE countries analyzed the link the between economic cycles, loan growth and loan losses at the aggregate level. Our paper considers the relationship between rapid credit growth and credit risk on bank level. Additionally, the considered period provides an opportunity to get an empirical answer on possible consequences of rapid credit growth in the CEE countries that have been only theoretically considered before the crisis. Fourthly, the results provide robust evidence of a positive relationship between previous credit growth and NPLs. Precisely, it provides evidence that credit growth is reflected on NPLs in two years. Finally, this research considers three types of credit growth (*bank's* credit growth*, bank's* credit growth above the country average and *bank's* credit growth above the CEE region average) in order to make a conclusion as to what kind of credit growth affects the NPLs the most. The results indicate that all considered types of credit growth will influence on the increase of NPLs in the future.

The following section of the paper gives a short review of previous research on credit risk and the relationship between credit growth and NPLs in the CEE countries. Section 3 discusses the main methodological issues. Section 4 describes the empirical model and data used. Section 5 presents a review of the empirical results and Section 6 provides conclusions.

2. *LITERATURE REVIEW*

In the last two decades, the banking sector of the CEE countries has attracted the attention of many scholars. During the process of transition from planned to market-oriented economies that started in 1990, these countries went through many changes. The period was characterized by foreign capital inflow, foreign bank ownership, reforms of the banking system, and rapid credit growth.

Therefore, the main focus of previous research was banking system reform and development (Bonin

and Schnabel 2011; Bonin et al. 2013), the role of foreign ownership in the CEE countries (Kraft 2002; de Haas and van Lelyveld 2006; Aydin 2008) and differences between foreign and domestic banks (Bonin et al. 2005; Degryse et al. 2012; Havrylchyk and Jurzyk 2011). Rapid credit growth in the CEE countries was also in the focus of some authors (Pazarbasioglu et al. 2005; Backé and Égert 2006; Backé et al. 2007). These authors concluded that rapid credit growth which is not followed by economic growth can cause macroeconomic and financial instability and endanger asset quality in the future. It was not possible to find empirical evidence about the relationship between credit growth and credit risk at that time. Therefore, researchers could only detect credit growth above equilibrium and try to predict possible consequences of rapid credit growth.

During the credit and economic growth in the CEE countries, credit risk was not the focus of scientific research. However, several papers analyzing credit risk in these countries were written during that period (Glogowski 2008; Agoraki et al. 2011). The emergence of the crisis and the rise of NPLs increased the interest for analyzing determinants of credit risk in developed and developing countries. However, most of the research papers still focused on macroeconomic determinants and/or bank-specific variables of NPLs (Cerutti et al. 2010; Jakubík and Reininger 2013; Klein 2013). The general conclusion of these papers is that various macroeconomic variables have a significant impact on rise of NPLs. The main determinant in all papers is GDP growth. Other macroeconomic determinants such as unemployment, interest rate, inflation and exchange rate also show a significant influence on the NPLs ratio. Some researchers found that bank-specific variables such as profitability, capital ratio and bank size also have a significant influence.

Considering the rapid credit growth before the crisis and the fact that the increase of NPLs was greater in the CEE than other European countries motivated us to investigate the influence of rapid credit growth on credit risk in the CEE countries. However, rapid credit growth is very rarely included in credit risk modeling in the CEE countries. Some recent research papers on credit risk in the CEE countries also include first or second lag of credit growth as control variables (Glogowski 2008; Škrabić Perić 2012; Jakubík and Reininger 2013; Klein 2013; Skarica 2014). The results changed the sign and statistical significance with regard to the indicator used and the number of lags. Additionally, most of the abovementioned studies, except Glogowski (2008) and Škrabić Perić (2012), used the indicator of credit growth on aggregate level (credit to GDP). This research tries to investigate the real influence of rapid credit growth on NPLs on the bank level by using three different indicators of credit growth.

3. METHODOLOGY

Considering previous research on credit risk, it is obvious that NPLs are an autoregressive process (Agoraki et al. 2011; Jakubík and Reininger 2013; Klein 2013,...). Therefore, the lagged value of NPLs is included in the model.

For empirical analysis of NPLs, the following regression is used:

$$npls_{it} = \mu + \gamma npls_{i,t-1} + \beta_1 x_{it1} + \beta_2 x_{it2} + \ldots + \beta_K x_{itK} + \alpha_i + \varepsilon_{it}, i = 1,\ldots, N, t = 1,\ldots, T, \quad (1)$$

where N is the number of banks, T is the number of periods, npl_{it} is the value of the dependent variable of bank i in the period t, the parameter μ is the constant, $npls_{i,t-1}$ is the lagged value of $npls_{it}$, x_{it1}, ..., x_{itK} are the independent variables and K is the number of independent variables in the model while β_1, β_2, ..., β_K are the parameters of exogenous variables and γ is the parameter of lagged dependent variable. Finally, α_i is the time-invariant bank-specific effect (it can be alternatively specified to belong to an error term) and ε_{it} is the remaining part of the error term in the model. It is assumed that all variables x_{it} are uncorrelated with ε_{it}. With inclusion of lagged dependent variable $npls_{i,t-1}$ in the model, it becomes correlated with α_i. Due to the observed correlation, the most commonly used estimator for static panel data becomes a bias and is inconsistent. Therefore, specific estimators are derived for dynamic panel data. The most used estimators in research with a large N and a small T are the difference GMM estimator proposed by Arellano and Bond (1991) and the system GMM estimator proposed by Arellano and Bover (1995) and Blundell and Bond (1998). To overcome the correlation between $npls_{i,t-1}$ and α_i , Arellano and Bond (1991) proposed taking equation (1) in first differences:

$$npls_{it} - npls_{i,t-1} = \gamma\left(npls_{i,t-1} - npls_{i,t-2}\right) + \beta_1(x_{it1} - x_{i,t-1,1}) + \beta_2(x_{it2} - x_{i,t-1,2}) + \ldots + \beta_K(x_{itK} - x_{i,t-1,K}) + \left(\varepsilon_{it} - \varepsilon_{i,t-1}\right); \quad (2)$$
$$i = 1,\ldots N, t = 1,\ldots, T$$

Although (2) α_i is excluded from the equation, the problem arises with $npls_{i,t-1}$ which is correlated with ε_{it-1}. In order to solve this problem, instrumental

variables are included in the model. Valid instruments for ($npls_{i,t-1} - npls_{i,t-2}$) are lagged values of dependent variable in level ($npls_{i,t-2},...,npls_{i2},npls_{i1}$). Further, if some of $x_{itk}, k=1,2,...,K$ is endogenous in the sense that $E(x_{itk}\varepsilon_{is})=0$ for $s>t$ and $E(x_{itk}\varepsilon_{is})\neq 0$ otherwise, lagged values of independent variable ($x_{it-2,k},...,x_{i2k}, x_{i1k}$) are valid instruments for ($x_{itk}-x_{i,t-1,k}$). Thus, this estimator outperforms previous estimators in terms of bias, but it shows weaknesses when the dependent variable is highly persistent and in the case when the ratio of the individual effect variance and the remained error variance increases. However, the system GMM, except the equation in first differences (2), uses equation in levels (1). To avoid the problem of correlation between $npls_{i,t-1}$ and α_i in equation (1), instrumental variables are introduced. The valid instrument for lagged dependent variable $npls_{i,t-1}$ in equation (1) is lagged value of dependent variable in first differences $\Delta npls_{i,t-1}$. Also, in the case of endogenous independent variable $x_{itk}, k=1,2,...,K$, $\Delta x_{i,t-1,k}$ is a valid instrument for this variable. This estimator shows better properties than the difference GMM estimator and all other estimators in numerous studies (Blundell and Bond, 2000; Bond 2002,...). The two-step system GMM estimator is applied here because it relaxes the assumption of error term independency and, moreover, it is robust to heteroscedasticity and it is more efficient than the one-step estimator. However, standard errors of the two-step estimator underestimate the standard error in small samples but Windmeijer (2005) corrected the formula for the two-step variance and made it concurrent to the one-step estimator.

4. EMPIRICAL MODEL AND DATA

Considering the results of previous research, the basic model of NPLs consists of the main determinants of bank-specific and main macroeconomic indicators:

$$\begin{aligned} npls_{it} &= \mu + \gamma npls_{i,t-1} + \beta_1 roa_{it} + \\ &+ \beta_2 ltotalassets_{it} + \beta_3 inflation_{it} + \\ &+ \beta_4 gdpg_{it} + \beta_5 rirr_{it} + \alpha_i + \varepsilon_{it}; \\ i &= 1,\ldots,N, t = 1,\ldots,T, \end{aligned} \quad (3)$$

where dependent variable $npls_{it}$ is a share of NPLs in total loans for bank i in year t, $npls_{i,t-1}$ is a lagged value of dependent variable, roa_{it} is an indicator of profitability for bank i in year t, $ltotalassets_{it}$ is an indicator of the size of bank i in year t, $inflation_{it}$ is the percentage of price change in the country of the bank i in year t, $gdpg_{it}$ is the GDP growth in the country of the bank i in year t, $rirr_{it}$ is the real interest rate in the country of the bank i in year t, μ is a constant term, α_i is a specific error for each bank and ε_{it} is the remain part of error, γ, $\beta_1,...,\beta_5$ are parameters to estimate.

Data has been obtained from the Bankscope database and covers the period from 1999 to 2013 *(T=15)* for $N=237$ banks from eleven CEE countries which are members of the European Union: Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia, and Slovenia. The research includes 4 types of banks: bank holdings, commercial banks, cooperative banks, and savings banks. All macroeconomic variables are obtained from the World Bank Database.

The first group of variables is a group of bank-specific variables. The dependent variable is *non-performing loans in total loans ratio (npls)* and it is expected that the lagged values of NPLs will have a statistically significant positive influence on NPLs today. The same influence was found in similar studies (Jiménez and Saurina 2006; Škrabić Perić 2012; Jakubík and Reininger 2013).

The first bank-specific independent variable is *return on average assets (roa)* and it is expected that the increase in ROA will have a statistically significant negative influence on NPLs because a higher profitability results in a lower rate of NPLs. Moreover, many authors have emphasized this highly negative connection between ROA and NPLs.

The second bank-specific variable is *logarithm of banks' total assets (ltotassets)* and it is expected that the value of total assets will have a positive or negative influence on NPLs. On the one hand, it is expected that greater assets bring a greater responsibility for managers and that way greater assets decreases the bank's risk taking. Additionally, big banks usually have corporate governance and a better quality system, therefore, negative relation can be expected. On the other hand, large banks can increase their risk because of "too big to fail" presumption.

The second group of variables is a group of macroeconomic variables that includes three indicators. *Gross domestic product growth (gdpg)* is measured as a percentage. The expected sign is negative because a better economic situation would increase the creditworthiness of borrowers and facilitate loan repayment. In most empirical papers, GDP growth is proven as the most important determinant of NPLs.

The second macroeconomic variable is inflation. *A percentage change of general price increase (inflation)* is the measure of inflation. Inflation can have a positive or negative influence. In some cases, inflation can have a negative influence on NPLs because it reduces the loan's real value and makes repayment easier or, based on the Philip curve, inflation can decrease

unemployment and increase creditworthiness of borrowers. However, more often, it has a positive sign which indicates that because of 'sticky wages' inflation diminishes the real value of wages (Klein 2013; Skarica 2014).

The third macroeconomic determinant is the interest rate measured by *real interest rate (rirr)*. The expected sign for interest rate is positive because an increase in interest rate decreases the borrower's ability to repay debt. In most previous research, the interest rate has shown a positive sign.

To investigate the relationship between credit growth and NPLs, the model of credit risk is extended by previous values of credit growth:

$$\begin{aligned} npls_{it} &= \mu + \gamma npls_{i,t-1} + \beta_1 roa_{it} + \\ &+ \beta_2 ltotalassets_{it} + \beta_3 inflation_{it} + \\ &+ \beta_4 gdpg_{it} + \beta_5 rirr_{it} + \sum_{k=1}^{p} \beta_{5+k} gloans_{i,t-k} + \\ &+ \alpha_i + \varepsilon_{it}; i = 1,\ldots, N, t = 1,\ldots, T, \end{aligned} \quad (4)$$

where $gloans_{i,t-k}$ is an indicator of credit growth for bank i in year t-k, p is the maximum number of previous years which are being considered.

The basic model of credit risk is upgraded by previous values of credit growth. Three different types of *credit growth* indicators are considered. The first indicator is *bank's total loans growth (gloans)* in percentage.

The second indicator of credit growth is *the difference between a bank's loan growth in year t and average loan growth in the whole country in the year t (lcounaverage)*. This indicator refers to the bank's credit growth in comparison to the country average. The significance of this indicator suggests that banks with credit growth above industry average have a higher portfolio risk. Namely, to achieve above average credit growth, banks have to attract new clients by offering better conditions (lower interest rate) or accepting less transparent clients. The second scenario increases NPLs in the future.

Finally, the third indicator is *the difference between a bank's loan growth in year t and average loan growth in the whole CEE region in the year t (lregaverage)*. This indicator is introduced because most foreign banks in the CEE countries are a part of a multinational bank holding and all credit policies are designed in the head office for all subsidiaries considering the situation in the whole CEE region. This indicator can, therefore, show whether this group's credit policy is a cause of credit risk in CEE banks because country specifics are neglected.

Different *credit growth* indicators have been chosen in order to determine what kind of credit growth influences NPLs the most and how fast it is manifested. Also, using different indicators of credit growth contributes to the robustness of the relationship between NPLs and credit growth.

Descriptive statistics of all variables and their mean values, minimum and maximum values, standard deviations and number of observations are presented in Table1.

In the correlation matrix in Table 2, it is evident that the correlation coefficient between NPLs and other independent variables except credit growth have the expected signs. Correlation between *gloans* and *npls* is negative. Its relation is not totally unexpected because it is not possible that credit growth endangers credit quality in the same year. Our assumptions is that several years are necessary for credit growth to influence the growth of NPLs.

Considering coefficients between independent variables, it can be concluded that the problem of multicollinearity can arise because of the correlation between *gdpg* and *rirr*. Therefore, greater attention will be given to these two variables in the empirical part.

Table 1: Descriptive statistics of all variables

Variable	Obs	Mean	Std. Dev.	Min	Max
npls (%)	1219	11.30948	13.02354	0	96.24
roa (%)	1219	0.446669	2.639641	-29.28	18.41
totassets (million USD)	1219	5107.661	8464.637	11.13	52017.19
gdpg (%)	1219	2.284307	4.748597	-14.81	11.62
inflation (%)	1219	4.602264	5.055068	-1.22	45.8
rirr (%)	1219	5.229902	4.437748	-7.21	29.36
gloans (%)	1162	18.82279	37.54952	-67.28	602.65
lcounaverage (percentage point)	1162	-3.6187	34.50223	-139.14	537.61
lregaverage (percentage point)	1162	-5.46248	35.07209	-98.16	565.24

Table 2: Correlation matrix of dependent and independent variables

	npls	roa	ltotassets	inflation	gdpg	rirr	gloans
npls	1.0000						
roa	-0.4391	1.0000					
ltotassets	-0.2150	0.2153	1.0000				
inflation	-0.1429	0.0536	-0.1085	1.0000			
gdpg	-0.2363	0.2350	-0.0380	0.1285	1.0000		
rirr	0.2185	-0.2088	-0.0863	-0.1344	-0.6148	1.0000	
gloans	-0.2689	0.0202	-0.1369	0.1855	0.3301	-0.2352	1.0000

Table 3: Correlation matrix between three different credit growth indicators

	gloans	lcounaverage	lregaverage
gloans	1.0000		
lcounaverage	0.8494	1.0000	
lregaverage	0.9390	0.9023	1.0000

The correlation matrix in Table 3 shows very strong positive correlation levels between the three credit growth indicators. In that sense, it is expected that all credit growth indicators will have a similar impact on NPLs and they will be included separately in different specifications of the model to prevent the problem of multicollinearity.

5. EMPIRICAL RESULTS

To look for evidence on relationship between previous values of credit growth and credit risk, nine different specifications of the model of credit risk are estimated using the two-step system GMM estimator with a robust standard error. To avoid the problem of too many instruments for a dependent variable, a maximum of two lags is used as the instrument. There is convincing evidence that too many instrument conditions introduce bias while increasing efficiency. Simply by being numerous, instruments can overfit instrumented variables (Roodman 2009). Additional instruments for independent variables are introduced only if the result of the Sargan test indicates a problem of endogeneity in the model. The Sargan test has the null hypothesis that the instrumental variables are uncorrelated with the residuals. The results of the empirical part of the research are presented in Table 4 and Table 5.

All model specifications from Table 4 and Table 5 except Model(3) passed the Sargan test which means there is no problem of endogeneity in all the specified models except in Model(3). Additional instrument variables are introduced but the result of the Sargan test did not change. Also, in all specifications there is no second order autocorrelations between the difference residuals. The p value of all AR(2) tests is above 0.05.

Model(1), Model(2) and Model(6) are different specifications of the basic model. When Model(1) was upgraded with additional variables, a lot of variables became statistically insignificant or changed the sign. That can be a consequence of multicollinearity between the interest rate and GDP growth. A potential problem is indicated by the value correlation coefficient in Table 2. Therefore, two different versions of basic models are considered. In Model(2)-Model(5) the variable *rirr* is omitted while in Model(6)-Model(9) the variable *gdpg* is omitted.

The results from Table 4 and Table 5 indicate that the lagged value of NPLs is, as expected, positive and statistically significant. The results indicate a high persistence of NPLs in the CEE countries. Therefore, *roa* has a negative and statistically significant influence, *gdpg* a negative and statistically significant influence, *rirr* a positive and statistically significant influence while *bank's size* and *inflation* are not statistically significant.

Based on our research findings, *roa* has a negative and statistically significant influence on dependent variable in all specifications of the model. This result was expected because it corresponds with economic theory and earlier empirical findings (Jiménez and Saurina 2006; Škrabić Perić 2012).

The second bank-specific variable is *ltotassets* which turned out to be statistically insignificant in all specifications of the model. These results can be explained with the fact that several big banks dominate in most of the CEE countries. Therefore, big banks increase credit risk to additionally increase market share. On the other hand, smaller banks are forced to accept riskier business in order to survive. Additionally, these results are in line with Škrabić Perić (2012).

The most important macroeconomic variable in our model is *gdpg* and the results indicate that it has

Table 4: Results of models of NPLs and credit growth (1-5)

Variable	Model (1)	Model (2)	Model (3)	Model (4)	Model (5)
L.npls	0.858***	0.818***	0.807***	0.805***	0.798***
	(0.0421)[a]	(0.0978)	(0.138)	(0.102)	(0.112)
roa	-1.174***	-1.054***	-1.488***	-1.508***	-1.540***
	(0.284)	(0.239)	(0.325)	(0.274)	(0.293)
ltotassets	0.498	0.347	0.904	0.187	0.353
	(1.466)	(1.431)	(1.669)	(1.713)	(1.851)
inflation	0.0116	-0.00765	0.00367	0.0514	0.00300
	(0.0757)	(0.0877)	(0.0960)	(0.0918)	(0.0947)
gdpg	-0.102**	-0.157***	-0.0824	-0.106**	-0.102*
	(0.0501)	(0.0486)	(0.0587)	(0.0532)	(0.0577)
rirr	0.141**				
	(0.0687)				
L.gloans			0.00768		
			(0.00933)		
L2.gloans			0.0209**		
			(0.00911)		
L3.gloans			0.0125		
			(0.00799)		
L.lcounaverage				0.0185	
				(0.0129)	
L2.lcounaverage				0.0228**	
				(0.0101)	
L3.lcounaverage				0.00669	
				(0.0102)	
L.lregaverage					0.0187
					(0.0120)
L2.lregaverage					0.0230*
					(0.0122)
L3.lregaverage					0.0110
					(0.0106)
_cons	0.814	2.360	-0.108	3.436	3.109
	(5.035)	(5.223)	(6.612)	(6.492)	(6.970)
N	958	1252	965	965	965
Sargan	0.1246	0.0405	0.0354	0.0899	0.0965
AR(2)	0.4977	0.8703	0.9937	0.9081	0.9620

[a]Standard errors in parentheses, * p<0.1, **p<0.05, ***p<0.01

a negative sign and statistical significance in different specifications. However, *gdpg* is economically and theoretically an important determinant of NPLs in all previous empirical studies. Another macroeconomic indicator *rirr* was included in model specifications, i.e. Model(6)-Model(9) and the results showed a positive influence and strong statistical significance.

In contrast with previous research on credit risk, inflation is not statistically significant. Similar results were obtained from a recent paper by Tanasković and Jandrić (2015). In the last several years, NPLs in the CEE countries has increased rapidly while all these countries have kept the inflation stable (Iossifov and Podpiera 2014). Considering this fact, the result of non-significant inflation is not totally unexpected.

In Model(3)-(5) and Model(7)-(9), lagged values of different types of credit growth are included. In order to avoid introduction of too many lags, considering the previous results and short time span, first, second and third lags are included in all specifications.

From the results, it is clear that all types of credit growth are dangerous. All used indicators of credit growth have similar values. Hence, two-year lagged credit growth has a positive influence on the

Table 5: Results of models of NPLs and credit growth (6-9)

Variable	Model (6)	Model (7)	Model (8)	Model (9)
L.npls	0.857***	0.923***	0.867***	0.859***
	(0.0428)[a]	(0.0792)	(0.0641)	(0.0605)
roa	-1.229***	-1.550***	-1.488***	-1.580***
	(0.272)	(0.342)	(0.295)	(0.309)
ltotassets	0.826	-0.000932	-0.531	-0.513
	(1.420)	(1.905)	(1.928)	(2.007)
inflation	0.0187	-0.0232	0.0674	0.0119
	(0.0810)	(0.101)	(0.0873)	(0.0927)
rirr	0.186***	0.125*	0.157**	0.161**
	(0.0638)	(0.0752)	(0.0788)	(0.0791)
L.gloans		0.0179		
		(0.0201)		
L2.gloans		0.0336**		
		(0.0162)		
L3.gloans		0.00795		
		(0.0118)		
L.lcounaverage			0.0244	
			(0.0195)	
L2.lcounaverage			0.0218*	
			(0.0124)	
L3.lcounaverage			-0.00569	
			(0.0107)	
L.lregaverage				0.0275
				(0.0190)
L2.lregaverage				0.0253*
				(0.0131)
L3.lregaverage				0.00415
				(0.0102)
_cons	-0.662	1.258	4.534	4.946
	(4.845)	(6.896)	(6.948)	(7.101)
N	958	736	736	736
Sargan	0.1576	0.1877	0.2740	0.2449
AR(2)	0.4787	0.6756	0.7414	0.6784

[a]Standard errors in parentheses, * p<0.1, **p<0.05, ***p<0.01

occurrence of NPLs in the CEE countries. Finally, the bank's credit growth above credit growth in the CEE region is the least dangerous one. It is statistically significant at the level of 10% in Model(5) and Model(9). Therefore, credit policy on a regional base does not additionally increase the credit risk of banks in the CEE countries.

The results indicate that credit growth in the CEE countries influences NPLs somewhat faster than in developed countries i.e. four years in Spain (Jiménez and Saurina 2006) and three years in developed economies (Foos et al. 2010). However, these results are in line with Jakubík and Reininger (2013) who used quarterly data and found that the sixth lag of credit to GDP influence increases NPLs on the aggregate level.

As additional robustness check, all model specifications are estimated by using Least Squares Dummy Variables corrected estimator proposed by Kiviet (1995). Namely, Kiviet (1995) upgraded fixed effects estimator by removing bias from estimation. This estimator showed good properties in simulation studies (Kiviet 1995; Judson and Owen 1999,…). The results are presented in Table A1 and Table A2 in the Appendix. The results additionally confirm the findings in Table 4 and Table 5.

6. CONCLUSION

This paper investigates the influence of bank-specific variables, macroeconomic variables and credit growth indicators on NPLs in eleven CEE countries in the period 1999-2013. The results of all bank-specific and macroeconomic variables are almost in line with previous research on credit risk. ROA has a negative and statistically significant influence on NPLs, while the size is not statistically significant. GDP growth and interest rate are significant macroeconomic variables. GDP growth has a negative influence on NPLs. Inflation is not statistically significant. This paper contributes to previous research by considering theoretical implications of credit growth on the increase of NPLs and by introducing different indicators of credit growth in the empirical model of credit risk. In that sense, the focus from the usually investigated variables has been moved to earlier values of credit growth when the problem actually occurred. Our research has shown that two years are necessary for credit growth to influence the growth of NPLs for all types of credit growth.

Therefore, based on the results of our research, several important *policy implications* have emerged. Firstly, supervisors should pay much more attention to the possibility that credit risk can also increase during the upturns in the economy. This phenomenon can be controlled by introducing the previous value of credit growth of the bank in the credit risk model. Also, credit risk models have to be detected by banks that have credit growth above the country average in an observed year. Supervisors have to monitor those banks more strictly by requiring additional loan loss provisions or limiting their lending.

Lastly, our suggestion for further research is to estimate a similar model with credit by industry sector specifications and credit by currency specifications. Unfortunately, the above mentioned data are not available in the Bankscope database.

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APPENDIX. ROBUSTNESS CHECK

Table A1: Results of models of NPLs and credit growth (A1-A5) - LSDVc estimator

Variable	Model (A1)	Model (A2)	Model (A3)	Model (A4)	Model (A5)
L.npls	0.807***	0.756***	0.702***	0.705***	0.711***
	(0.0354)[a]	(0.0264)	(0.0229)	(0.0257)	(0.0247)
roa	-0.845***	-0.996***	-1.375***	-1.352***	-1.348***
	(0.169)	(0.115)	(0.149)	(0.147)	(0.149)
ltotassets	2.307	1.922*	1.302	0.888	0.686
	(1.735)	(1.162)	(1.250)	(1.251)	(1.275)
inflation	-0.106	-0.139*	-0.156*	-0.121	-0.188**
	(0.0797)	(0.0795)	(0.0837)	(0.0817)	(0.0876)
gdpg	-0.193***	-0.252***	-0.184***	-0.219***	-0.208***
	(0.0742)	(0.0540)	(0.0494)	(0.0463)	(0.0478)
rirr	0.120*				
	(0.0672)				
L.gloans			-0.00911		
			(0.00837)		
L2.gloans			0.0111*		
			(0.00622)		
L3.gloans			0.0113*		
			(0.00611)		
L.lcounaverage				0.00593	
				(0.00895)	
L2.lcounaverage				0.0186***	
				(0.00527)	
L3.lcounaverage				0.0146*	
				(0.00811)	
L.lregaverage					0.00628
					(0.00817)
L2.lregaverage					0.0212***
					(0.00649)
L3.lregaverage					0.0128*
					(0.00657)
N	956	1250	963	963	963
R2					

[a]Standard errors in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A2: Results of models of NPLs and credit growth (A6-A9) - LSDVc estimator

Variable	Model (A6)	Model (A7)	Model (A8)	Model (A9)
L.npls	0.811***	0.743***	0.738***	0.746***
	(0.0345)[a]	(0.0385)	(0.0374)	(0.0377)
roa	-0.902***	-1.365***	-1.367***	-1.364***
	(0.163)	(0.161)	(0.162)	(0.159)
ltotassets	3.264**	3.118*	3.088*	2.823*
	(1.654)	(1.723)	(1.674)	(1.708)
inflation	-0.0853	-0.0804	-0.0525	-0.120
	(0.0825)	(0.0887)	(0.0853)	(0.0850)
rirr	0.252***	0.166***	0.206***	0.205***
	(0.0683)	(0.0611)	(0.0597)	(0.0608)
L.gloans		-0.0189*		
		(0.00968)		
L2.gloans		0.0297***		
		(0.00901)		
L3.gloans		0.00245		
		(0.00925)		
L.lcounaverage			-0.00132	
			(0.00975)	
L2.lcounaverage			0.0265***	
			(0.00852)	
L3.lcounaverage			0.00452	
			(0.0106)	
L.lregaverage				-0.000732
				(0.00965)
L2.lregaverage				0.0341***
				(0.00931)
L3.lregaverage				0.00450
				(0.0101)
N	956	734	734	734
R2				

[a]Standard errors in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

DE GRUYTER OPEN

South East European Journal of Economics and Business
Volume 12 (2) 2017, 85-101
DOI: 10.1515/jeb-2017-0018

THE SOCIAL AND FINANCIAL EFFICIENCY OF MICROFINANCE INSTITUTIONS: THE CASE OF BOSNIA AND HERZEGOVINA

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Abstract

This paper investigates the financial and social efficiency of microfinance institutions ("MFIs") in Bosnia and Herzegovina, as well as the effects of the latest crisis on these "two-dimensional" efficiencies. Specifically, we analyze the efficiency of MFIs in Bosnia and Herzegovina (BiH) as a good case of a European, post-war country in transition with a developed micro-financial sector. The efficiency analysis relies on secondary data collected and investigated through Data Envelopment Analysis (DEA). The study covers data for the period commencing in 2008 and ending in 2015. In our empirical investigation, we find a suboptimal level of both financial and social efficiency among MFIs in BiH. However, financial efficiency is significantly higher than social efficiency, while small-sized MFIs over perform larger ones in both the financial and social dimensions. As a result of the crisis, MFIs recorded a declining trend in efficiency up to 2010, after which they began to show signs of slow recovery. However, our results suggest that MFIs prioritized financial over social goals in recovery period following the crisis.

Keywords: *Efficiency, Microfinance institutions, Bosnia and Herzegovina*

JEL classification: *C14, G29, L31*

1. INTRODUCTION

Microfinance tends to focus on serving low-income populations and as such has been promoted as a powerful solution in the fight against global poverty (AnneWelle-Strand et. al. 2010; Cull, Demirguc-Kuntand Jonathan 2009). We are currently witnessing a global debate over whether MFIs adhere to their initial socio-economic mission or are shifting towards prioritizing the achievement of their financial goals. (Widiarto and Emrouznejad 2015). It remains important that, in order to reach higher efficiency, MFIs should achieve successful outputs in both dimensions: social impact and financial sustainability. In the last few decades, microfinance has evolved on a global level from microcredit and micro-loans to borrowers previously without access to credit into complex microfinance (Ernst&Young 2014).

Although MFIs share many commonalities with traditional banks, such as the approval of loans, the charging of interest rates, collection of debts and in certain cases the collection of deposits, they still tend

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to operate in a different manner. The main difference, when compared to banks, lies in a MFI's double bottom line objective: social outreach and financial sustainability (Gutiérrez-Nieto et al. 2007). There are numerous studies that focus on banks, while the literature on MFIs is very limited (Widiarto and Emrouznejad 2015). Huge gaps can be identified, especially if we consider the role of MFIs in low-income countries. The main reason for these research gaps is the lack of available and standardized data (Widiarto and Emrouznejad 2015). This is a significant issue, since improvements in transparency levels would result in better fund allocation and would also provide benefits to donors and investors (Tucker 2011).

When it comes to measuring the efficiency of MFIs, we refer to the manner in which MFIs allocate and utilize their resources, such as assets and employees, in order to produce outputs measured in terms of their loan portfolio and poverty outreach (Bassem 2008). When measuring efficiency, both parametric and non-parametric methods can be employed. In the last few decades, non-parametric methods have been used extensively. According to Emrouznejad and Yang (2017), until 2016, there were 10,300 recorded studies that utilized non-parametric DEA analysis in their efficiency estimations.

However, traditional financial indicators are not sufficient when assessing microfinance performance, since, due to their special dual nature, sustainability is not necessarily limited to profitability but rather to the MFIs' ability to operate in the long run (Widiarto and Emrouznejad 2015). Using the traditional financial ratios in order to assess the efficiency of MFIs can be ambiguous, since they can succeed in one aspect but fail in others (Bogetoft and Otto 2010). When analyzing MFI efficiency, a modern efficiency approach is needed, one that is capable of being applied to multiple-inputs and multiple-outputs, as DEA does (Widiarto and Emrouznejad 2015).

The motivation for conducting this research is primarily to fill an identified research gap in this area. To the best of our knowledge, this is the first study investigating the social efficiency of MFIs in BiH using a non-parametric method. We identify BiH as a good case for the efficiency analysis of MFIs. MFIs from BiH are considered among the most successful on an international scale (Mix and AMFI 2009), which makes BiH a good example for testing the technical efficiency of MFIs. Secondly, this is the first study to explore "two-dimensional efficiency" in BiH, namely both financial and social efficiency. One study assessing MFIs' financial efficiency was conducted by Efendic and Hadzic (2017); however, the study does not include an analysis of both dimensions of efficiency.

The social dimension is especially important, since the microfinance sector in BiH began to develop after the war in the nineties as a tool in the fight against poverty and in post-conflict reconciliation (AnneWelle-Strand et al. 2010). The MFI sector plays an important role in financial inclusion in BiH. Considering how much time has passed since the war (1992-1995), it is important to determine whether MFIs in BiH are still concerned with their social role. In addition, our aim is to analyze levels of efficiency and to explore the differences among different sized MFIs, as well as the effect of the financial crisis on MFI efficiency. The recent financial crisis affected the European financial system and MFI operations with it. There is no study that explores the effect of the crisis on MFIs' financial and social efficiency in any of the European countries, to our knowledge.

The paper is organized as follows. Section 2 provides details on the financial and social dimensions and efficiency of MFIs. Microfinance in BiH is covered in Section 3, where the development of the sector and a short overview of the market in two BiH entities, the Federation of BiH and Republika Srpska, is briefly presented. Methodology and data are covered in Section 4, followed by a discussion of the empirical results in Section 5. The paper ends with conclusions and recommendations for further research.

2. THE "TWO DIMENSIONAL" EFFICIENCY OF MICROFINANCE INSTITUTIONS

Economic efficiency is rather a broad term that implies a state in an economy whereby resources are allocated in such a manner that their purpose, for which they are being used, is maximized, while waste and inefficiencies are minimized. Accordingly, measuring institution's economic efficiency represents one of the primary challenges of micro-economic analysis (Efendic 2014).

One of the most famous and most commonly used definitions of economic efficiency is "Pareto optimality," provided by Vilfredo Pareto (Cooper et al. 2006). This approach is further extended and exploited in DEA as the "Pareto-Koopmans" definition of efficiency (Cooper et al. 2006). Accordingly, measuring efficiency became an important activity, as organizations began to focus on improvements in their productivity (Cook and Seiford 2009). With its ability to cover different aspects of microfinance institutions, efficiency has been proposed as a measurement criterion of MFIs performance (Balkenhol 2007).

Because of MFIs' dual nature, serving both social and financial goals, there is a debate among those

whose focus is on the financial side, and those whose focus is on social aspects. Institutionalists focus on the financial aspects and are concerned with self-sufficiency and sustainability (Serrano-Cinca et al. 2009). On the other hand, welfareists claim that MFIs have to help the poor first, while profitability should be a secondary concern (Serrano-Cinca, et al. 2009). Accordingly, there is a belief that MFIs can achieve sustainability without achieving financial self-sufficiency (Morduch 2000). In addition, Morduch also claims that the discussion on microcredit performance almost completely ignores financial matters. The truth is that even though the primary goal of MFIs is to enable access to funds for low-income populations, they will not be able to achieve that goal without sustainable profitability. It can be concluded that MFIs must be efficient in both aspects in order to achieve "two-dimensional efficiency".

MFI efficiency is rarely assessed and analyzed, and when it is, the focus is usually on the financial aspect. When discussing social performance, the Yaron (1994) framework is widely accepted as a standard way of assessing MFIs. The framework is based on outreach and sustainability concepts. Outreach accounts for the number of clients that are being served and the quality of products offered to them. Alternatively, sustainability implies that the institution is generating income levels that are at least enough to cover the opportunity costs (Chaves and Gonzalez 1996). However, when it comes to measuring the social Double-Bottom line, there is no universal standard present (Zeller et al. 2006). Even though literature on the two-dimensional efficiency of MFIs is quite limited, there are a few influential studies. Wijesiri et al. (2015) in their paper examine the efficiency of 36 MFIs in Sri Lanka with two different DEA models in order to obtain scores for financial and social inefficiency. Conversely, a significant number of the observed MFIs are inefficient in both dimensions. This finding leads to the conclusion that MFIs that are inefficient in both dimensions, or efficient in only one, should work on solving their weaknesses and restructure their policy choices (Wijesiri et al. 2015).

Widiarto and Emrouznejad (2015) focus on the comparison of the DEA efficiencies of Islamic and conventional MFIs in terms of their social and financial efficiency. The study covers three different regions: the Middle East and North Africa (MENA), East Asia and the Pacific (EAP) and South Asia (SA) for the period from 2009 to 2010. Its results showed that MFIs in the EAP region perform quite impressively in their overall and financial efficiency, while their social efficiency is mediocre on average (Widiarto and Emrouznejad 2015). The main source of inefficiency, including overall, financial and social, is technical inefficiency. When it comes to the question of whether financial and social efficiency are mutually exclusive, Lebovics et al. (2016) found in 28 Vietnamese MFIs for the year 2011 that there was no correlation between those two types of efficiencies, meaning that there is no trade-off between them. They stress that where financial efficiency is concerned, learning effects and cost-efficiency seem to be crucial, whereas for social efficiency the quality of staff and the quality of leadership of the top managers appears to be of the most importance.

The relationship between financial and social efficiency measured by DEA was also the research focus of Serrano-Cinca et al. (2009). Of the 89 MFIs included in their international sample, only 13 show a higher level of social efficiency in comparison to financial efficiency. The conclusion is that when faced with a choice between social and financial efficiency, MFIs choose financial performance in order to be able to continue with their social aims.

Finally, social and financial efficiency is still at an early phase of research development and only a few studies have been conducted in this field. In addition, there are not many studies on MFIs efficiency in European countries. To the best of our knowledge, the social and financial efficiency of MFIs in Bosnia and Herzegovina were not explored in any of the previous studies. The aim of this study is to fill the identified gap in the literature.

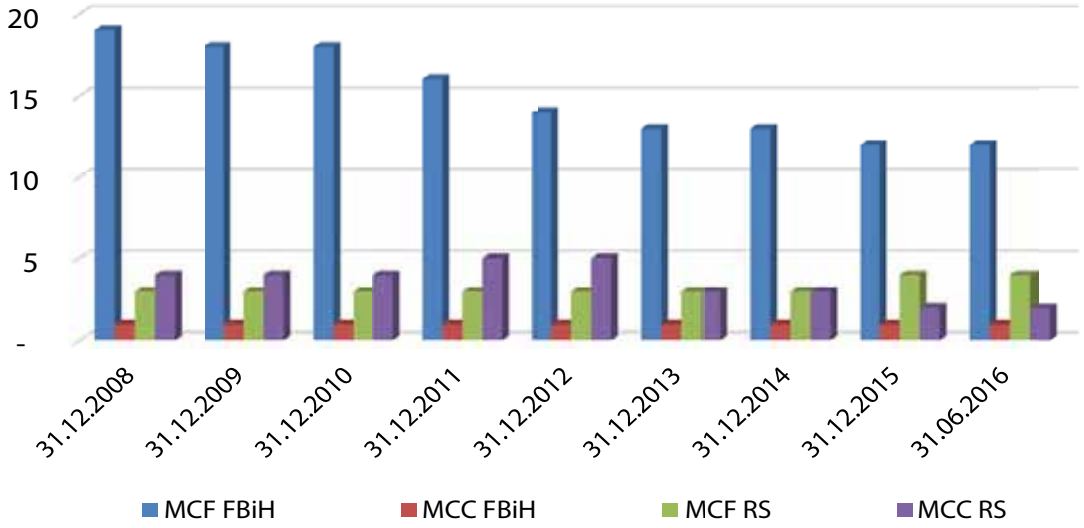
3. *MICROFINANCE IN BOSNIA AND HERZEGOVINA*

BiH is a transitional and developing country and is composed of two autonomous entities, the Republika Srpska (''RS") and the Federation of BiH (''FBiH"). Accordingly, the supervision of MFIs is at the entity and not the state level. However, MFIs in BiH were confronted with an enormous challenge when they first began providing loans (Berryman and Pytkowska 2014).

After the war in the nineties, microfinance in BiH played a dual role: to fight against poverty and as a tool for post-conflict reconciliation (AnneWelle-Strand, et al. 2010). After the war, unemployment rose to a level close to 85%, (Berryman and Pytkowska 2014). A large number of the MFIs operating today in this area began to operate in 1997 (Berryman and Pytkowska 2014).

Support to MFIs was mainly provided by the World Bank and a number of other bilateral and multilateral donors via its funding of a so-called local initiative projects (LIP) (WB 2005). By 2009 BiH was officially

Figure 1: The Number of MFIs in BiH



Source: Reports published by Banking Agencies in FBiH and RS; MCF refers to Microfinance foundations as non-profit MFIs. MCC refers to the micro-credit companies as for-profit MFIs [1]

Table 1: Overview of the financial services sector in BiH

Segment of the financial services sector (financial institutions)	2012		2013		2014		Assets growth index	
	Assets (in BAM mln)	Share (%)	Assets (in BAM mln)	Share (%)	Assets (in BAM mln)	Share (%)	13/12	14/13
Banks	21,226	86.31	22,066	87.13	22,821	87.35	103.96	10.,42
Investment funds	795	3.23	761	3	790	3.02	95.72	103.81
Insurance and reinsurance companies	1,174	5.27	1,232	4.86	1,356	5.19	104.94	110.06
Microcredit organizations	681	2.28	670	2.65	646	2.47	98.38	96.42
Leasing companies	716	2.91	597	2.36	512	1.96	83.38	85.76
Total for sector	24,592	100	25,326	100	26,125	100	102.98	103.15

Source: FBA, BARS, FBiH Securities Commission, RS Securities Commission, FBiH Insurance Supervisory

classified as the world's second most microfinance-saturated country (Milford et al. 2012).

According to the latest reports from 2016 published by the Banking Agency of the FBiH, 12 MFIs held a license for business operations in FBiH. Among those 12, 11 are non-profit organizations and 1 of which is a for-profit organization (FBA 2016). When we focus on microfinance in RS, according to the latest report published by the Banking Agency of RS, 8 MFIs held a license for doing business. Of these 8 MFIs, 5 are registered as for-profit institutions and 3 are registered as non-profit organizations (ABRS 2016) (See Figure 1).

In 2014, the microfinance sector held less than 3% of total assets of the financial system and its share has been declining since 2008, when its sector share was 4.7%. The details of these changes are presented in Table 1.

Based on the data presented in Table 1, it can be concluded that banks dominate the market. Analysis of the trends in financial performance and efficiency indicators in the period from 2008 to 2015 shows that the microfinance sector in BiH recorded a significant decline in most of the indicators, which highly correlate with the drop in total assets as well as in loans received from external financiers (Efendic and Hadzic 2017).

In addition, it is important to mention that MFIs in BiH have received in the last 15 years significant recognition and have been awarded for their high level of transparency and financial reporting.

1 Based on the Law on Microcredit organizations ('Official Gazette of the FBiH', No. 59/06) there are different capital requirements for Microcredit companies and Microcredit foundations: for a company 500,000 BAM, and for a foundation 50,000 BAM. Another major difference is in the maximum amount of credit that can be approved: for companies, this is 50,000 BAM, for foundations 10,000 BAM.

4. METHODOLOGY AND DATA

Parametric frontiers and Data Envelopment Analysis are the two main methodological approaches in efficiency assessment. The second is a non-parametric method that show an exponential growth in its use in academic research over the last forty years (Emrouznejad and Yang 2017). In addition, it is one of the most recommended methods when assessing the efficiency of financial institutions, and according to Banker and Natarajan (2008, p. 49) DEA methods were shown to be better than one-stage and two-stage parametric methods when estimating the individual productivity of institutions. In total there have been 10,300 DEA-related research articles published in different journals (Emrouznejad and Yang 2017). In comparison to parametric methods, DEA is based on a complex multi-input/output structure and deals with these issues in an effective and efficient way (Cooper et al. 2006).

The three other "frontier" parametric methods that are most commonly used are the "Stochastic Frontier Approach (SFA)" (Berger and Humphrey 1997), "Thick Frontier Approach (TFA)" (Berger and Humphrey 1997) and "Distributional Free Approach" (DFA) (Schmidt and Sickles 1984). The main characteristic of parametric methods is that they require prior formulation of the efficiency function and shape of the frontier.

For the purpose of our research we apply the DEA method as one of the most used and most popular non-parametric methods among researchers due to its objectivity based on the quantitative analysis of available data. In addition, DEA does not require an assumption of a functional form (Ramanathan 2003). Also, the DEA method is extensively used in analysis of banking efficiency in developing countries (Grigorian and Manole 2006), which is characteristic of BiH as well. Anayiotos et al. (2010, p. 250) choose the DEA method as appropriate for efficiency analysis since it is used in many analyses of bank efficiency and insurance companies; it is non-parametric method and therefore potentially inadequate assumptions regarding the error distribution are generally avoided; finally, the method separately analyzes the efficiency of each unit in relation to its reference, and in that way ensures the relative measure of efficiency for each of those units. In addition, DEA is an appropriate method for analysis of smaller sample sizes, with less data required and fewer assumptions to make (Evanoff and Israilevich 1991), and does not need a longer time series (Anayiotos et al. 2010). At the same time, the biggest disadvantage of this method is that it does not take into account measurement errors (Mester 1996). Also, statistical inferences are not possible with non-parametric methods, hence the DEA will account for the influence of different environmental objective factors as inefficiency (Evanoff and Israilevich 1991).

The DEA method is based on non-parametric linear programming efficiency analysis, which forms a linear production envelope or frontier on top of all of the data (Emrouznejad, et al. 2008). The decision-making units (DMU) that form the envelope and lie on the frontier are the best-practice units or benchmarks (Cooper et al. 2006), and accordingly, these DMUs are in DEA indices equal to "1". Otherwise, all other DMUs are considered inefficient, with DEA indices in the range between "0" and "1" (Ramanathan 2003).

The two basic DEA models are the CCR model of Charnes et al. (1978) and the BCC model of Banker et al. (1984). CCR assesses technical efficiency under a Constant Return to scale (CRS) condition (Charnes et al. 1979). In the basic DEA model, there are two approaches that can be used, the input-oriented approach, which maximizes proportional input reduction while holding outputs constant, and the output-oriented approach, which alternatively maximizes proportional output increase while keeping inputs constant (Charnes et al. 1979).

Input - oriented approach

$$\theta^* = Min\theta$$

subject to

$$\sum_{j=1}^{n} x_{ij}\,\lambda_j \le \theta^* x_{i0}\; i = 1, 2, \dots, m;$$

$$\sum_{j=1}^{n} y_{rj}\,\lambda_j \ge y_{r0}\; r = 1, 2, \dots, s;$$

$$\sum_{j=1}^{n} \lambda_j = 1$$

$$\lambda_j \ge 0\; j = 1, 2, \dots, n$$

Where:

θ^* is the optimal solution

x_{ij} the inputs vector of DMUi

y_{rj} the outputs vector of DMUr

$\sum_j^n \lambda_j = 1$ the convexity constraint

The DEA original formulation with the assumption of Constant Return to Scale (CRS), means that institutions were analyzed as they operate on the most productive scale (Widiarto and Emrouznejad 2015). Considering that this is often not the case, Banker et al. (1984) introduced the constraint $\sum_{j}^{n} \lambda_j = 1$ to represent

the convexity constraint for λ_j in Variable Return to Scale (VRS) condition, so that an institution will be compared to a similarly-sized institution that has a similar return to scale (Widiarto and Emrouznejad 2015). Hence, the scale efficiency (SCALE) was found to be the relative difference between CRS and VRS (CRS/VRS) technical efficiency scores (Coelli et al. 2005). In our analysis, we employed a VRS input-oriented, grand-frontier DEA model with pooled data. Although we considered using the output oriented method as well, we finally decided for input orientation due to the aim of evaluating the efficiency of management of MFIs in managing inputs to produce desired social and financial outputs.

When assessing MFI efficiency there are two approaches that can be used: the production and intermediation approaches (Berger and Humphrey 1997). The main difference between these two is that the production approach observes MFIs as a production unit that uses inputs such as labor to produce outputs such as loans and other financial services (Haq et al. 2010). Under the intermediation approach, MFIs are treated as DMUs that use inputs of deposits from surplus units to deliver outputs (loans and other financial services) to deficit units (Kipesha 2012).

MFIs in BiH, according to its local laws, are not allowed to collect deposits, due to that fact in our paper we use a production approach, as is done in many other studies in which the MFIs analyzed are not deposit-taking institutions (e.g. Kipesha 2012; Haq et al. 2010; Gutiérrez-Nieto et al. 2009; Hassan and Sanchez 2009; Sedzro and Keita 2009; Fluckiger and Vassiliev 2007; Gutiérrez-Nieto et al. 2007).

4.1. Selection of inputs and outputs

Specification of the inputs and outputs is crucial step when analyzing a financial institution (Serrano-Cinca et al. 2009). Berger and Humphrey (1997) suggest that one could assess efficiency under a variety of different output/input specifications, and see how the calculated efficiencies change as the specification changes. Still, there is no clear guideline on how to chose among a variety of specifications (Serrano-Cinca et al. 2009). Researchers may be tempted to add as many inputs and outputs as they find important or relevant for the purpose of their analysis, but problems arise if some of them are highly correlated (Jenkins and Anderson 2003). Another issue is that as we increase number of inputs and outputs in the DEA model, the number of DMUs with 100% efficiency also increases, and by adding an irrelevant variable in the model the result obtained could also change (Chaparro et al. 1999). However, after conducting a review of the available literature we decided to develop one main model specification and one test model specification. With respect to the availability of data in our sample, we considered all of the possible variables that are used in other studies and made a final list of inputs and outputs that are relevant for our research and in line with microeconomic theory. The inputs and outputs that we used for the purposes of our analysis are summarized in Table 2.

This study utilizes the data for 15 MFIs for the period from 2008 to 2015, with four registered in the RS and rest in FBiH. Data was obtained from several sources: official reports published by the Federal Banking Agency and Banking Agency of Republika Srpska, the MIX Market Database, Financial reports available on the MFIs' websites and Reports published by AMFI BiH (the Association of MFIs in BiH) for the period from 2008 to 2013. All monetary data are presented in BAM (Bosnian Convertible Mark, the official currency in BiH). The inputs used in the main model are the number of employees and total assets. Following microeconomic theory, labor and capital are the primary factors in the production process (Parkin 2012, p. 4). Accordingly, as a first "labor" input in our model we consider the number of employees. This input is extensively used in most of the previous efficiency analysis models (among others: Kipesha 2012; Haq et

Table 2: DEA Input / Output Variables

	Inputs	Outputs
Efficiency Models		
Financial Efficiency	• Number of Employees • Total assets	• Financial Revenue • Gross Loan Portfolio
Social Efficiency	• Number of Employees • Total assets	• Number of Active Borrowers
Test model		
Financial Efficiency	• Number of Employees • Total assets	• Gross Loan Portfolio

al. 2010; Sedzro and Keita 2009; Hassan and Sanchez 2009; Bassem 2008). The number of employees in our model reflects efficiency in managing human resources, which means that a MFI that produces a given level of outputs with fewer employees is considered a more efficient institution. As a second "capital" input we consider total assets to represent the capital for a production approach. Total assets as a category that shows little variability in the short term has widely been used as an input variable in many studies as well (among others: Widiarto and Emrouznjead 2015; Wijesiri et al. 2015; Tahir 2013; Kipesha 2012; Gutiérrez-Nieto et al. 2009; Hassan and Sanchez 2009; Bassem 2008; Gutiérrez-Nieto et al. 2007). In our model specification, this variable reflects the quality of managing the assets within one MFI. Accordingly, an MFI with a lower level of assets used in order to produce a given level of outputs is more efficient. The higher quality of management over the assets will result in more units of the outputs per unit of the assets. For outputs for financial efficiency we decided to use gross loan portfolio and financial revenue. Gross loan portfolio reflects the MFIs' role in financial intermediation and reflects the main output in the production process of the financial institution. This variable has been used as an output in previous studies as well (among others: Kipesha 2012; Hassan et al. 2012; and Gutiérrez-Nieto et al. 2009). Accordingly, considering the inputs used in the model, a higher level of loans provided/produced within one MFI reflects its higher efficiency in core business. The second output in our model, "financial revenue," is extensively used as an output in the production approach and as a proxy for sustainability. As an output in DEA, it is used in several previous studies as well (among others: Gutiérrez-Nieto et al. 2009 and Hassan and Sanchez 2009). It represents the performance of the institution in producing loans with a different level of quality. Accordingly, MFIs which in utilizing their inputs cannot collect enough revenue will not be able to operate and to achieve sustainability in the long run, no matter the level of loans provided.

However, the analysis of financial efficiency is more common, and thus it is easier to decide on inputs and outputs that will reflect MFI performance. This is not the case when focusing on the social dimension, which is rarely assessed and harder to measure (Serrano-Cinca et al. 2009). For the social efficiency model, we use the model specification with the same inputs as the main model of financial efficiency, and with the number of active borrowers as the single output. As the number of individuals that MFIs reach increases, MFIs are more efficient in fulfilling their founding mission of helping the unbanked population. More borrowers mean more of the unbanked population served. As such, it serves as a measure of MFI outreach and has been used in previous studies as well (among others: Widiarto and Emrouznejad 2015 and Tahir 2013). Definitions and references for variables used are provided in Appendix 1.

Considering the fact that we still do not have neither a consensus on the theory of banking firms, nor on the "explicit definition and measurement of banks' inputs and outputs" (Casu and Molyneux 2003, p. 1869), which is applicable to micro-finance institutions as a kind of banking firms, we do not have a consensus on the list of variables that reflect the "production" process and production function of these institutions. In line with this, we made an alternative model of DEA to check the stability of our results. Accordingly, considering the sensitivity of DEA on the selection of variables and number of variables (Fanchon 2003), to escape possible misspecifications we defined a test model with the same number of variables for financial efficiency as that of the social efficiency model (two inputs and one output). Accordingly, in the test model for financial efficiency we have decided to use the same two inputs as in the main model (number of employees and total assets) and a single output (Gross loans portfolio).

In the Table 3, descriptive statistics for the input and output data used are provided.

It is important to emphasize that in DEA analysis we only included non-zero, non-negative data and excluded MFIs that had less than two observations.

Table 3: Descriptive statistics –DEA inputs/outputs

	Units	N	Minimum	Maximum	Mean	Std. Deviation
Groloan	BAM '000	88	1402	228088	58101.89	57526.19
Finrev	BAM '000	88	134	69513	13699.83	13161.693
Noborow	Numeric	88	886	65866	22511.61	19386.43
Noemploy	Numeric	88	8	338	152.31	105.46
Totass	BAM '000	88	1532	251173	69343.42	67767.49
Valid N (listwise)		88				

Finally, we started with total a number of 119 observations, but due to the missing data we ended up with a total number of 88 observations (12 from RS MFIs and the rest for those in FBiH). Following previous studies (Widiarto and Emrouznejad 2015), we conducted the correlation analysis on the selected inputs and outputs variables and found a high level of correlation between them. The high correlation between the selected variables is expected due to their structure and nature (items from the balance sheets and income statements of the MFI). However, we kept these variables since they are important in efficiency analysis of MFIs (Widiarto and Emrouznejad, 2015) and also are used in many other studies (see Appendix 1). Following the explanation given by Widiarto and Emrouznejad (2015, p. 15), since the high correlations identified "do not necessarily imply causal relationship," we consider the DEA model appropriate and the results that it yields reliable. However, the same does not apply to the parametric efficiency measurement since the "multi-co-linearity problem makes beta coefficients for correlated independent variables unreliable" (Widiarto and Emrouznejad, p. 15). Finally, with respect to the given arguments we decided to choose DEA as a method for an efficiency analysis of MFIs in Bosnia and Herzegovina.

5. EMPIRICAL RESULTS

DEA efficiencies were calculated for each MFI with a VRS approach on grand-frontier for the period from 2008 to 2015. The results imply that the majority of MFIs throughout the analyzed period have a higher level of financial than social efficiency. On average, DEA scores for both financial and social efficiency are suboptimal, 0.87 and 0.59 respectively. The results are summarized in the Table 4:

The given results "FVRSTE" and "SVRSTE" are our main model's VRS results for financial and social efficiency, respectively. In addition to these results, "FVRSTE2", which are provided in Appendix 4, represent the test model for financial VRS technical efficiency. However, the results from the given test model have a strong correlation with those of the main model (see Appendix 3). In all models we are focusing on the VRS results and discuss the results only for the main models ("FVRSTE" and "SVRSTE"). When analyzing the given results, we can see that they consistently lead to a common conclusion: MFIs have a higher level of financial than social efficiency. Our test model shows almost identical results to the main model (see Appendix 4). The DEA score for financial efficiency is at the 0.87 level, and while the score for social efficiency is at the 0.59 level. Accordingly, efficiency overall is found to be rather low, especially with regard to the social dimension. When it comes to "FVRSTE", 87% is a signal of technical inefficiencies, with a potential of 13% for improvements. The study reveals even lower social efficiency, which is found at the level of 59%, and which suggests that the potential for social efficiency improvements is 41%. The given results reveal that MFIs are wasting their resources and there is significant potential to improve their technical efficiencies. This led us to the conclusion that MFIs in BiH use too much labor (employees) and capital (assets) for the level of their outputs. In addition, the similar results for CRSTE and VRSTE financial and social efficiency confirm that the scale of the operation is not the issue, since their scale efficiency is estimated at a level close to optimal. Finally, we can conclude that MFIs in BiH should reconsider business policies and their operations, and put additional focus on reaching a larger number of clients. In Table 5 return to scale efficiencies are presented for both dimensions.

Table 4: Summary statistics for the pooled DEA local grand-frontier (one frontier for all years)

Variable	Obs	Mean	Std. Dev.	Min	Max
Financial efficiency					
FCRSTE	88	0.86	0.08	0.59	1
FVRSTE	88	0.87	0.09	0.60	1
FSCALE	88	0.98	0.02	0.87	1
Social efficiency					
SCRSTE	88	0.55	0.15	0.37	1
SVRSTE	88	0.59	0.18	0.39	1
SSCALE	88	0.96	0.06	0.67	1
List of abbreviations:	CRSTE- constant return to scale technical efficiency (TE); VRSTE - variable return to scale TE, SCALE - scale efficiency; F - stands for financial, S - stands for social dimension				

Table 5: Summary statistics for the pooled DEA local grand-frontier (one frontier for all years) – return to scale efficiencies

Financial efficiency		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Optimal	14	15.9	15.9	15.9
	Drs	57	64.8	64.8	80.7
	Irs	17	19.3	19.3	100.0
	Total	88	100.0	100.0	
Social efficiency		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Optimal	4	4.5	4.5	4.5
	Drs	51	58.0	58.0	62.5
	Irs	33	37.5	37.5	100.0
	Total	88	100.0	100.0	
List of abbreviations: Drs – decreasing return to scale, Irs – increasing return to scale					

When it comes to the return to scale analysis, 14 units are considered benchmarks for financial efficiency analysis, which means that they have an efficiency equal to 1 or they create the efficiency frontier. However, 57 units or 64.7 % have decreasing returns to scale, suggesting that they are exhausting their economies of scale. In addition, 17 units or 19.3% have increasing returns to scale, which means that unused capacities in the scale of their operations are present. When analyzing social efficiency, 4 units are considered benchmarks. Finally, 51 unites or 58% showed decreasing returns to scale, while 33 or 38% showed increasing returns to scale.

5.1. Social vs. financial efficiency

When it comes to the differences between financial and social efficiency, even though the primary mission of MFIs should be to make a social contribution, they cannot operate in the long run without financial sustainability. To explore the relationship between the financial and social efficiency of MFIs in BiH, Spearman's Rho Rank-Order correlation coefficients of DEA scores are calculated. According to the results of Spearman's correlation (Appendix 3), the social and financial efficiency of MFIs in BiH have a significant positive correlation, which suggests that MFIs with higher financial efficiency also have higher social efficiency.

The institutional geographic position is also considered a relevant factor for MFI efficiency (Gutiérrez-Nieto et al. 2009). Hence, we conducted an analysis of the differences between efficiency levels of MFIs operating in FBiH and those operating in the RS. As previously mentioned, our sample includes four MFIs from the RS, with the rest from FBiH. The results for joint grand-frontier on pooled data (one frontier for all MFIs, in all years for both entities) are presented in Table 6.

According to the DEA scores from the main model, MFIs operating in the RS have a slightly higher level of financial efficiency comparing to MFIs operating in FBiH (0.91 vs. 0.87) but on the other side, significantly

Table 6: Differences in DEA scores between entities (main model) [2]

Federation of Bosnia and Herzegovina (FBiH)					
	N	Mean	Std. Deviation	Minimum	Maximum
Financial efficiency					
FCRSTE	76	0.85	0.08	0.59	1.00
FVRSTE	76	0.87	0.09	0.60	1.00
FSCALE	76	0.98	0.02	0.87	1.00
Social efficiency					
SCRSTE	76	0.57	0.16	0.37	1.00
SVRSTE	76	0.60	0.19	0.39	1.00
SSCALE	76	0.96	0.07	0.67	1.00
Valid N (Listwise)	76				
Republika Srpska (RS)					
Financial efficiency					
FCRSTE	12	0.89	0.07	0.81	1.00
FVRSTE	12	0.91	0.08	0.81	1.00
FSCALE	12	0.98	0.02	0.94	1.00
Social efficiency					
SCRSTE	12	0.46	0.06	0.38	0.60
SVRSTE	12	0.48	0.05	0.43	0.60
SSCALE	12	0.96	0.05	0.87	1.00
Valid N (listwise)	12				

2 More detailed results are available by request from the corresponding author Velid dr. Efendic: velid.efendic@efsa.unsa.ba

lower level of social efficiency (0.48 vs. 0.60). The results show that MFIs in FBiH are socially more sensitive compared to MFIs in the RS, where the difference between the financial and social DEA scores is larger. For the efficiency comparison between FBiH and RS MFIs within the analyzed period, a Mann-Whitney rank sum test is used. This test is a non-parametric (distribution-free) test for testing an independent group with the aim of identifying whether the scores from one entity of BiH are ranked significantly higher than from the other. The Mann-Whitney rank sum test uses the ranks of the data, which means that the efficiency score is considered a test variable and the origin of the MFI is considered a group variable. Finally, according to the results from the Mann-Whitney test, there is a significant difference between the financial and social efficiency of MFIs in FBiH and the RS.

Table 7: Results of the Mann Whitney Test to compare differences in efficiency of MFIs from FBiH and RS

Ranks				
Mann-Whitney Test	entity	N	Mean Rank	Sum of Ranks
Financial efficiency (FVRSTE)	RS	12	52.58	631.00
	FBiH	76	43.22	3285.00
	Total	88		
Social efficiency (SVRSTE)	RS	12	29.71	356.50
	FBiH	76	46.84	3559.50
	Total	88		

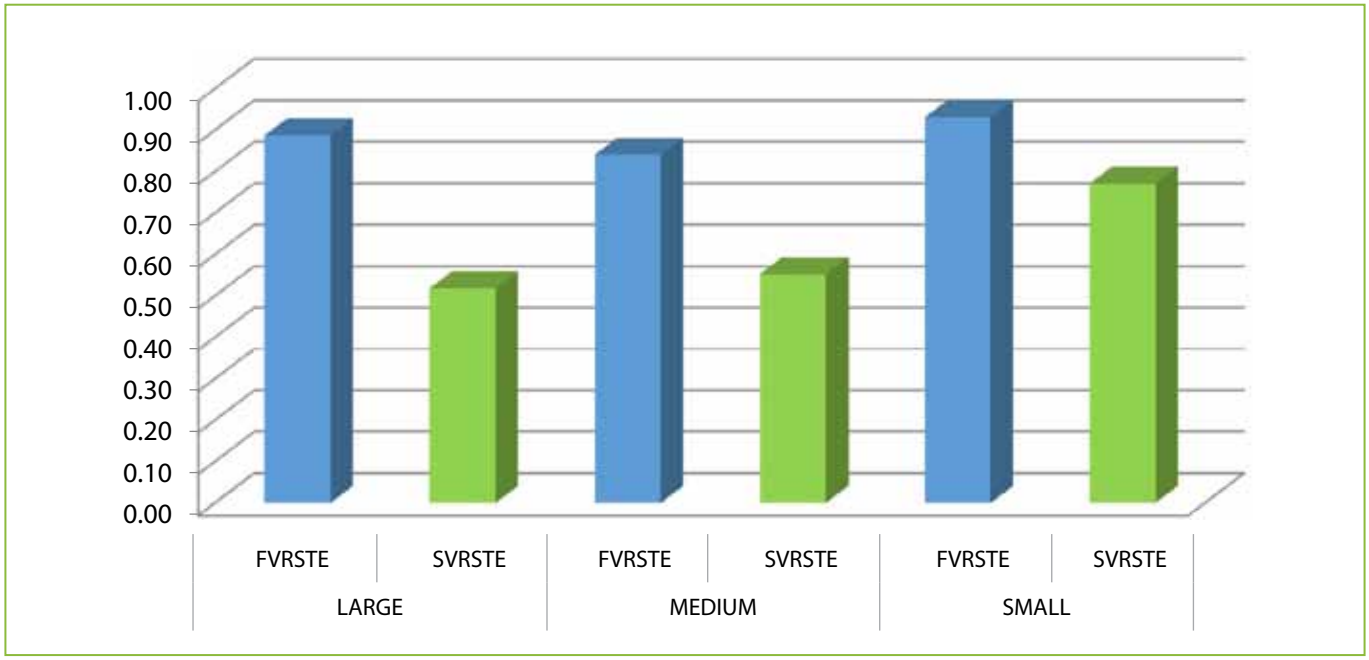
The results of the Mann-Whitney test reveal that there is a significant difference in efficiency due to the MFIs entity location. The same applies for both financial and social efficiency. Following the results (see Table 7 and Table 8), we can conclude that MFIs from the RS have statistically significant lower social efficiency compared to MFIs in FBiH.

Table 8: Test statistics of the results of the Mann - Whitney Test to compare differences in efficiency of MFIs from FBiH and RS

Test Statistics[a]		
	Financial efficiency (FVRSTE)	Social efficiency (SVRSTE)
Mann-Whitney U	359.000	278.500
Z	-1.181	-2.159
Asymp. Sig.(2-tailed)	.238	.031

In addition, we assessed differences in MFI efficiency based on the size of their assets. Generally speaking, the size of MFIs is important in efficiency analysis. Differently-sized institutions have different economies of scale, which means that their efficiency could be significantly different (Efendić and Hadžić 2017). Bassem (2008) assessed in his study the DEA efficiency of 35 MFIs in the Mediterranean zone during the period between 2004 and 2005, and found that the size of the MFI has a negative effect on their efficiency. For

Figure 2: DEA scores in relation to total assets (main Model)



the purpose of our analysis we categorized MFIs into three groups based on total asset size, from small, medium to large scale ones, according to the following classification: small scale MFI, with total assets from 0-9.9 million BAM (S), medium scale, 10-99.9 million BAM (M), and large scale, from 99.9 million BAM (L). Accordingly, we check if different sized MFIs focus deferentially toward financial efficiency, or social contributions. We assumed that large-scale MFIs perform better in financial efficiency, while small and medium-sized MFIs focus more on achieving higher levels of social efficiency than large ones.

When analyzing the DEA scores in relation to the total asset size of MFIs, in the case of large and medium sized MFIs both financial and social efficiency levels tend to be lower compared to small scale MFIs (Figure 2)[3]. This means that small-scale MFIs are more efficient in using their inputs. This could be due to the smaller number of clients they have and their capacity to assess each client individually and to take care of their needs, as well as to have a better system for monitoring their clients. However, while large scale MFIs focus more on economies of scale, as their assets grow, they focus more on fulfilling their financial goals. This means that, no matter larger they are in scale, large MFIs' relative outreach is smaller than those of small MFIs. In addition, for the analysis of the efficiency scores variations among the different sized MFIs, we adopted the Kruskal-Wallis rank test. Our results confirm a significant difference in the efficiency of differently sized MFIs (Table 9)

Table 9: Results for Kruskal-Wallis test on different sized MFIs

Kruskal-Wallis Test	Size	N	Mean Rank
Financial efficiency (FVRSTE)	Small	18	61.61
	Medium	41	34.83
	Large	29	47.55
	Total	88	
Social efficiency (SVRSTE)	Small	18	69.00
	Medium	41	42.24
	Large	29	32.48
	Total	88	

From Table 9 it can be seen that the highest financial efficiency is present within small MFIs, which are followed by large ones in the case of financial efficiency, while for social efficiency medium sized MFIs are in second place. The lowest mean rank is within medium sized MFIs for financial efficiency, while on the contrary large MFIs have the lowest level of social efficiency.

Table 10: Test statistics of the Kruscal-Wallis test

Test Statistics[a,b]		
	Financial efficiency (FVRSTE)	Social efficiency (SVRSTE)
Chi-Square	14.393	23.310
Df	2	2
Asymp. Sig.	.001	.000
a. Kruskal Wallis Test		
b. Grouping Variable: Size		

Finally, we can conclude that our results confirm ($p = 0.00$ for both efficiency scores) that there is a statistically significant difference in financial and social efficiency between the different sized MFIs. This means that a MFIs scale of operation is important for its efficiency. In addition, the management of each MFI has to take this into consideration when setting up their long-term strategy. For financial as well for social performance, the best scale of operations is up to 9.9 mil BAM of assets, or within the category of small-sized MFIs. Accordingly, policy makers and governments that want to enhance the outreach of unbanked population in their environment should support small MFIs in their business, since their social sensitivity is higher compared to larger MFIs.

5.2. Crisis effects on the two-dimensional efficiency of MFIs

The literature on the effects of the global financial crisis showed that even though microfinance still has deep shock-resistant roots, it has become more linked to domestic and international financial markets, and thus the financial crisis is more likely to have a negative impact on its institutions (Littlefield and Kneiding 2009). Furthermore, Di Bella (2011) finds that links between microfinance and both international and domestic conditions are today much stronger than was previously believed and that MFIs are now more similar to traditional lending institutions. In our research, we assumed that during the crisis period, efficiency levels significantly decreased. We conducted a trend analysis of efficiency levels, which is presented in Figure 3.

3 A more detailed results are available at request to the corresponding author Velid dr. Efendic: velid.efendic@efsa.unsa.ba

Figure 3: Financial and Social DEA scores-Overview for the analyzed period

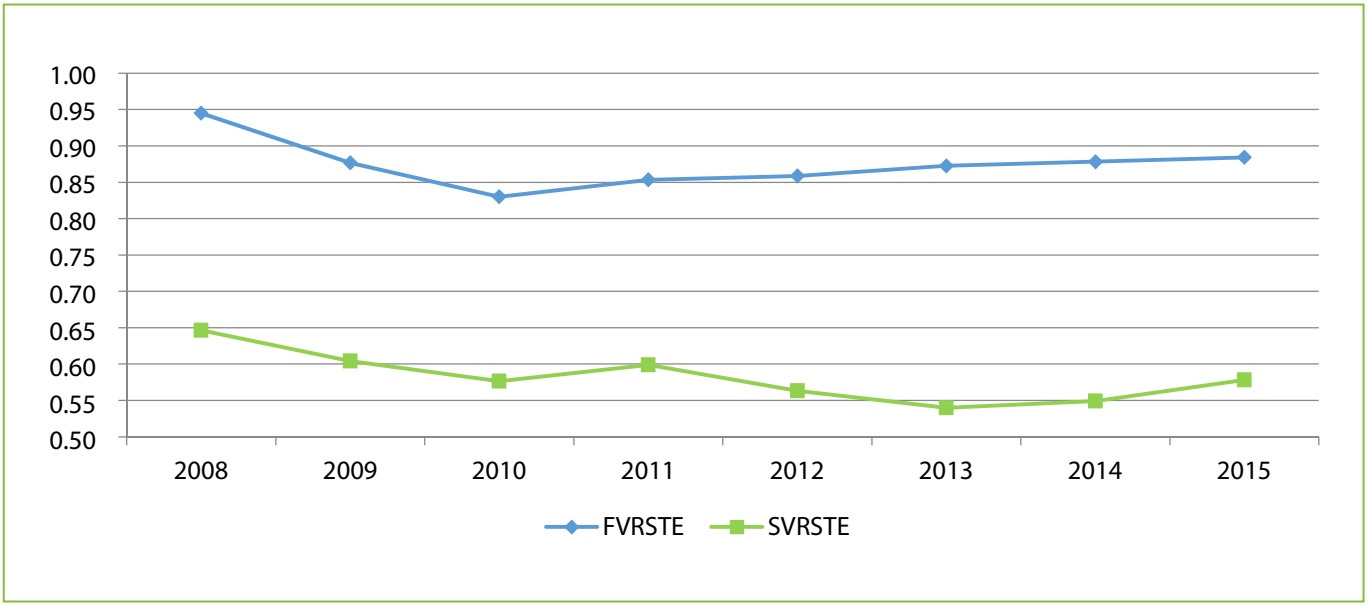


Figure 3 shows that the crisis had a higher negative effect on the financial rather than social efficiency of MFIs. The difference between financial and social efficiency decreased within the period 2010 to 2011. This leads us to the conclusion that MFIs retained their social role during the crisis. MFIs had the highest efficiency levels in the year 2008, which was the year leading up to the beginning of the financial crisis. The levels of both financial and social efficiency decreased up to 2010, when they reached their lowest values. This means that the crisis had a lagged effect in the period between 2008 and 2010. However, the financial efficiency score followed a positive trend from 2010, while social efficiency scores again decreased after 2011 and reached their lowest value in 2013. Accordingly, MFIs were more focused on financial efficiency in the after-crisis recovery period, which is in line with the aim of achieving sustainability. This is reasonable to expect, since sustainability goals are expected to be prioritized over social goals after the crisis recovery period.

It is also important to mention that the differences between financial and social efficiencies slightly decrease in the period from 2008 to 2011. This can be partially addressed by changes in loan policies. Before the crisis happened, MFIs were issuing a large number of loans without really considering their clients' indebtedness levels. Due to imperfect information about their indebtedness (a credit registry was introduced in 2008), clients were able to take a new loan in another MFI, regardless of the fact that they may be in late with the payments on their first loan. A survey of MFI clients conducted by Maurer and Pytkowska (2011) found that nearly 60% of borrowers had more than one outstanding microcredit debts, with a full 9% having more than five outstanding microcredit debts. When the crisis hit the market, many of the borrowers defaulted on their loans and both the level of NPLs and the PAR significantly increased. Hence, MFIs needed to introduce stricter credit policies so the number of borrowers significantly decreased, leaving a base of high quality clients. Since 2011, the market has shown signs of recovery, followed by a continuous increase in financial efficiency. At the same time, after a slight recovery in 2011, the level of social efficiency began to decrease through 2013, after which it once again began to show signs of a lagged recovery[4].

Finally, we can conclude that although financial efficiency is higher than social efficiency, we have identified a suboptimal level for both efficiencies. In addition, differently sized MFIs have significantly different average efficiencies. Small MFIs are the most financially and socially efficient MFIs. The crisis had a negative effect on the efficiency of MFIs in BiH, however the effect is significantly higher on financial rather than on social efficiency. After the crisis, the recovery proved to be slower for social efficiency, which suggests that MFIs prioritized financial goals over social goals in this period.

4 A more detailed results are available at request to the corresponding author Velid dr. Efendic: velid.efendic@efsa.unsa.ba

6. CONCLUSION

In this paper, we investigate the "two dimensions" of social and financial efficiency of MFIs in BiH during and after the recent financial crisis. The results of the DEA analysis reveal that the average efficiencies of MFIs for both the financial and social efficiency are quite below optimal values: 0.87 and 0.59, respectively. The correlation between these two is positive and statistically significant, suggesting that more financially efficient MFIs are more socially efficient as well. When assessing MFIs based on the differences in their total asset size, our results confirm that large and medium sized MFIs have a lower level of both financial and social efficiency than smaller ones. Still, the differences are much more visible in the case of social efficiency in comparison to financial efficiency.

The study reveals that the crisis had a negative effect on both financial and social efficiency, while the difference between the two efficiencies slightly decreased within the period 2008 to 2011. This leads us to the conclusion that MFIs retained their social role. However, after the crisis, the recovery showed the opposite, with financial efficiency prioritized over social efficiency, suggesting that MFIs were focused on their sustainability over their social purposes.

Finally, the results of this study suggest higher financial efficiency compared to social efficiency. However, we can conclude that although MFIs did not lose their social aims, their financial aims significantly over-perform social ones.

The small sample size is a significant limitation of this study. However, further research with a larger sample size consisting of international MFIs would be an improvement and would enable comparison between levels of efficiency and its determinants among different countries. Since the analysis of efficiency determinants is rarely assessed, it would be useful to expand this research and to analyze which determinants have direct influence on both social and financial efficiency.

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APPENDICES

Appendix 1: Input/Output Variables

Inputs	Definition	Link with Literature	Units
Noemploy - Employees	The number of individuals who are actively employed by an MFI. This number includes contract employees or advisors who dedicate the majority of their time to the MFI	Bassem(2008), Hassan and Sanchez (2009), Sedzro and Keita (2009), Kipesha (2012), and Haq et al. (2010)	Numeric
Totass- Total assets	Total of all net asset accounts.	Widiarto and Emouznejad (2015), Wijesiri et al. (2015), Tahir (2013), Kipesha (2012), Gutiérrez-Nieto et al. (2009), Hassan and Sanchez (2009), Bassem (2008)	BAM ´000
Outputs	Definition	Usage in Literature	Units
Finrev - Financial Revenue	Revenue from loan portfolio. It is used as an output in the production approach and a proxy for sustainability since an MFI that cannot collect enough revenue will not be viable to operate in the long run by itself	Gutiérrez-Nieto et al. (2009) and Hassan and Sanchez (2009).	BAM ´000
Groloan - Gross Loan Portfolio	The outstanding principal balance of all of an MFI's outstanding loans, including current, delinquent, and restructured loans, but not loans that have been written off. It does not include interest receivable	Kipesha (2012), Hassan et al. (2012), Gutiérrez-Nieto et al. (2009)	BAM ´000
Noborow - Number of Active Borrowers (Social output)	The number of individuals who currently have an outstanding loan balance with the MFI or are primarily responsible for repaying any portion of the gross loan portfolio. Herein, it is used as an output to resemble the breadth of outreach.	Widiarto and Emrouznejad (2015), Tahir (2013)	Numeric

Source: MIX Market Glossary and (Widiarto and Emrouznejad, 2015), with authors updates

Appendix 2: Correlation of the inputs and outputs used

Spearman's rho (N=88)	Groloan	Finrev	Noborow	Totas	Noemploy
Groloan	1.00	0.95**	0.96**	0.99**	0.95**
Finrev	0.95**	1.00	0.93**	0.95**	0.94**
Noborow	0.96**	0.93**	1.00	0.96**	0.95**
Totass	0.99**	0.95**	0.96**	1.00	0.96**
Noemploy	0.95**	0.94**	0.95**	0.96**	1.00

**. Correlation is significant at the 0.01 level (2-tailed).

Appendix 3: Spearman's Rho correlation of the social and financial efficiency scores for all models

Spearman's rho (N=88)	FCRSTE	FVRSTE	FSCALE	SCRSTE	SVRSTE	SSCALE	FCRSTE2	FVRSTE2	FSCALE2
FCRSTE	1.0	0.97**	0.21*	0.23*	0.26*	0.01	0.94**	0.91**	0.20
FVRSTE	0.97**	1.00	0.04	0.27*	0.29**	-0.01	0.91**	0.94**	0.03
FSCALE	0.21*	0.04	1.00	0.04	0.07	-0.01	0.14	0.00	0.91**
SCRSTE	0.23*	0.27*	0.04	1.00	0.97**	-0.21*	0.23*	0.28**	-0.01
SVRSTE	0.26*	0.29**	0.07	0.97**	1.00	-0.37**	0.24*	0.29**	0.01
SSCALE	0.01	-0.01	-0.01	-0.21*	-0.37**	1.00	0.08	0.03	0.10
FCRSTE2	0.94**	0.91**	0.14	0.23*	0.24*	0.08	1.00	0.97**	0.23*
FVRSTE2	0.91**	0.94**	0.00	0.28**	0.29**	0.03	0.97**	1.00	0.08
FSCALE2	0.20	0.03	0.91**	-0.01	0.01	0.10	0.23*	0.08	1.00

**. Correlation is significant at the 0.01 level (2-tailed).

Appendix 4: Descriptive statistics DEA results - all models

Descriptive Statistics DEA results – all models					
Variable	**Obs**	**Mean**	**Std. Dev.**	**Min**	**Max**
Main model - Financial efficiency					
FCRSTE	88	0.86	0.08	0.59	1
FVRSTE	**88**	**0.87**	**0.09**	**0.60**	**1**
FSCALE	88	0.98	0.02	0.87	1
Main model - Social efficiency					
SCRSTE	88	0.55	0.15	0.37	1
SVRSTE	**88**	**0.59**	**0.18**	**0.39**	**1**
SSCALE	88	0.96	0.06	0.67	1
Financial efficiency 2					
FCRSTE2	88	0.85	0.08	0.59	1
FVRSTE2	**88**	**0.87**	**0.09**	**0.60**	**1**
FSCALE2	88	0.98	0.02	0.87	1
CRSTE- constant return to SCALE technical efficiency (TE); VRSTE - variable return to scale TE, SCALE – scale efficiency; F- stands for financial, S- stands for social dimension					

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ISSN 2233-1999