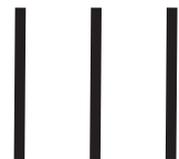


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THE POLICIES AND MEASURES FOR SELF-EMPLOYMENT AND ENTREPRENEURSHIP IN MACEDONIA AMONG THE ROMA COMMUNITY

Vesna Garvanlieva ANDONOVA^{a*}, Marjan NIKOLOV^b, Deniz SELMANI^c, Igor MITEVSKI^d, Fatima OSMANOVSKA KUNDOVSKA^e

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Abstract: Roma community are vulnerable to both the economic and social shocks which hamper their participation within the national employment policies. Relatively few Roma use the state's programs for employment and entrepreneurship enhancement despite their willingness. Even though the access to these programs is still low, the perception among a significant number of the Roma entrepreneurs (formal and informal) is that the offered programs may help in the development of their businesses. The research reviews and analyzes the policies for socio-economic access and inclusion of Roma in Macedonia within the context of entrepreneurship, covering formal businesses and informal businesses as well as considering a gender perspective, and regional variation of the usage of the policy measures.

Key words: othering, entrepreneurship, Roma, Chi-Square test, labor market.

JEL Classification: J15

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1. Introduction

The research focuses on exploring the effects of specific policy measures on the entrepreneurial undertaking and the perception on the effects of socio-economic inclusion of Roma entrepreneurs linking it to the phenomenon of “otherness” in conducting business. The model of the research touches upon the middleman minority theory as one of the economic explanations of the othering in entrepreneurship as part of ethnic entrepreneurship (Bonachich, 1973). The following hypotheses are proposed and tested:

Hypothesis 1: The current policies for entrepreneurship had a positive effect on the development of Roma entrepreneurs and contributed to the socio-economic inclusion of Roma in Macedonia;

Hypothesis 2: Business operations in Macedonia contributes to the development of the concept of “otherness”.

The public policies in Macedonia for social inclusion through the labor market of socially excluded vulnerable groups to a greater extent tend towards inclusion through employment (i.e., active measures for the subsidized employment, training for the known employer, useful community work, internships, training in scarce skills, training in foreign languages, training in advanced ICT skills, etc.) rather than through self-employment (self-employment / formalization of businesses, lending, start-up education, etc.). Thus, it is important to present the labor market profile for Roma in Macedonia.

In the second quarter of 2016 the unemployment rate throughout the Republic of Macedonia was 24% (1,678,805 total working age population, of which 948,376 economically active population, and 227,702 unemployed). At the end of September 2016¹, the total number of unemployed was 103,646 persons, of whom 5,920 (5.7%) were Roma, including 2,128 Roma women (36%). Roma as an ethnic community, face twice as high unemployment rate compared to non-Roma. According to a data from 2011 regarding Macedonia, the level of unemployment among the Roma was 53% while in the same period among non-Roma population, the unemployment rate is almost half, i.e., 27%. Among the women, the level of unemployment is even more pronounced, the unemployment rate of Roma women, at the same period, is 70% and among non-Roma women is 35%. According to the Agency for Employment of Republic of Macedonia (AERM), the number of unemployed Roma in the last three years in absolute number has dramatically increased (in 2013 the total number of unemployed Roma was 1,743, in 2014 was 5,842, and in 2015 was 6,234 people).

¹ Data published by the Agency for Employment of Macedonia, for September 2016.

However, the trend does not indicate necessarily increasing unemployment among Roma, however it may indicate an increasing in the number of registered job seekers in the records of the AERM². The drastic increase in the number of unemployed persons in these years is due to the increasing number of the registered unemployed individuals without any educational attainment and persons with acquired primary education. In addition, in the capital city of the country, Skopje 26.5% of all social aid receivers (as vulnerable group) are Roma. Although their absolute number is declining in the last three years, their percentage share in the overall number of social aid users is increasing³.

The unemployment rate as the sole indicator of the overall situation in the labor market may be an insufficient indicator, thus the jobless rate can serve as an additional explanatory indicator. According to a regional Roma communities survey conducted by the UNDP and WB (2011), the jobless rate is defined as the ratio of those who are not employed nor in the educational process⁴ compared to the rest of the economically active population. The jobless rate among Roma male was 53% whereas among non-Roma males was 31%, while among the Roma female was 81% versus 53% among the non-Roma females in Macedonia. According to the same survey, the rate of informal employment incidence among Roma in Macedonia is 64% and 25% among non-Roma. However, the percentage of Roma who are self-employed (own business) as a percentage of the total number of Roma in Macedonia is 4%, while for non-Roma is 10%.

Besides the higher unemployment, jobless and lower rate of self-employed among Roma compared to other remaining ethnic groups, i.e., non-Roma in Macedonia, the discrimination, stereotypes, and social exclusion also remain open issues. In the last progress report of the EU (EC, 2016 pp. 63-66) for Macedonia, it is stated: *“Overall, segregation, stereotyping and other forms of discrimination remained prevalent. Most Roma are unemployed, have no proper health coverage, live in inappropriate living conditions in segregated housing and are socially excluded...”* ...*“Some efforts were made to improve the socioeconomic conditions of vulnerable groups, particularly Roma, through specific support programs in the areas of employment, education, and health. However, the root causes of this phenomenon still require greater structural efforts and the investment of proper resources.”*

The policies for the entrepreneurship can play a major role in economic development and can be a tool for social inclusion via the labor market for the Roma community. The academic literature, identifies different definitions of what

2 Reports received from the Agency for Employment of Republic of Macedonia (AERM) records of unemployed persons by level of education.

3 Records of the center for Social Work Skopje, may 2017, based on public information act request.

4 NEET - Not in Education, Employment, or Training.

entrepreneurship is. There have been many attempts by various stakeholders in society to come to a widely acceptable definition of what entrepreneurship represents, however still there is no one agreement for entrepreneurship. According to economic and political scientist Schumpeter (Schumpeter, 1934), an entrepreneur is any individual who offers something new to the economy. Moreover, European Commission through the Green paper on Entrepreneurship (EC, 2003) defines entrepreneurship as the creative capacity of the individual, independently or within an organization to identify opportunities in order to produce new value or economic success.

According to Ramadani *et al.* (2014) entrepreneurship is a process of seeking innovative opportunities in uncertain and risky circumstances, combining efficient and effective factors of production in order to achieve profitability and business growth. This definition explains how the Roma entrepreneurs in Macedonia seeks exactly to find innovative features in the uncertain political and socio-cultural and risk environments.

By “othering” and “otherness” we mean technical terms used in the social sciences and humanities for how people tend to see others (humans or nature), which are distinct and separate. It is used in at least two different ways. In the first case, the terms are used in a general and neutral way in order to signify what is fundamentally different. In the second case, the words mean a complex system of devaluation, i.e. in this case, it means reducing the value of the Roma identity.

For the first time the concept of “otherness” is presented in the late 18th century by the German philosopher Friedrich Hegel (Brons, 2015, pp. 69-90). At that point Hegel’s “otherness” is seen as an integral part of self-consciousness, he argues that the individual during the process of coming to consciousness includes “other,” which serves as an affirmation of the individual in relation to others. In this study of “otherness” would be defined as a negative attitude followed by a discriminatory and racist attitude of the society towards Roma. It will also pay attention to how Roma entrepreneurs react to this attitude which society has for them.

2. Literature review

In the last decade, the Roma question has been set high on the European Union agenda with the goal the socio-economic status of the Roma minority in Europe to be improved. Ringold *et al.* (2005), explains that the period after the communism has contributed to a grand scale the situation of Roma to get worse.

McGarry (2012) argue that the European Union started to dedicate more attention to the socio-economic integration of Roma in the areas of education and employment because it endorses the politics of redistribution. Also, McGarry (2012) notes that the Roma civil society perceives EU anti-discrimination

regulative as not suitable to answer to inter-related socio-economic and political needs of the Roma. Iulius Rostas *et al.* (2015) claims that inclusion policies towards Roma are a patron-client relationship, meaning the clients (Roma) are excluded from the process of designing the policies thus the participation of Roma is limited to participate in important decisions that affect the lives of the Roma.

According to Nadir Redzepi (2011), inclusion policies targeted to Roma in Macedonia come as a result of the international pressure that was set to the Macedonian government, primarily because of the ambition of Macedonia to join the EU. The starting point for the analysis of public policies for Roma is signing of the International Declaration “Decade of Roma Inclusion 2005-2015”, where the signatory countries including Macedonia pledged to work on reducing the gap between Roma and non-Roma in the four priority areas of employment, housing, education and health with special focus on gender issues, discrimination, and political participation. As a result, the Republic of Macedonia adopted a series of measures under the so-called soft-law - programs and plans that are not legally binding and that depended primarily on the goodwill of the government.

In the period prior 2008-2011, the UNDP independent evaluation of the programs and measures for employment (O’Higgins and Kirevska, 2012) states that “the Roma remain clearly underrepresented amongst grant recipients.” The Republic of Macedonia in 2011 specifically designed two programs that target the unemployed Roma, the program for self-employment and program for support the Roma. In 2012 and 2013 the Roma were included in the Operating Plan for active programs and measures for employment as a specific target group in the programs for inclusive growth (subsidy program, a program for organizing public works, programs with combined packages of support for employment, and other subprograms and measures). The effects of the programs and measures are various, in particular, some programs improved the employment of the general population however certain programs and measures did not bring positive effect and required major revisions.

Parthenis and Fragoulis (2016) state that “stereotypical perceptions about the Roma have been constructed over an extended period of time and are reproduced through state policies and everyday practice of the dominant groups”. Today, such approach is seen as “powerful strategy of racial labeling and persecution” of the Roma. Therefore, the Roma are in a situation to hide their identity and to accept the dominant culture; this process is seen as “othering”, with other words such stereotypical perceptions force Roma to mask their identity to avoid social exclusion (Klingman, 2001).

Claudia Tavani (2012), claims that Roma identity to be preserved it is necessary next to the principles of non-discrimination and equality to add the principle of recognition through the prism of collective right for cultural identity.

In the area of education, Mengstie (2011), points out that school environment along the “social interactions of teachers and students in and out-of-school, teaching-learning processes, student-teacher relationships, the nature and contents of subjects, textbooks (regarding contents, naming, exemplification, historical and cultural contents or their representations for certain groups), language usage, and other are important factors in the process of constructing otherness”.

The literature on public policies for entrepreneurship explores the question of the need for “developing a culture of entrepreneurship” Gibb (2000), the author concludes that there is no agreement on the definition of entrepreneurial culture. For some, it means maximizing the potential for the individuals to start a businesses, and to others it means maximizing the potential for individuals in all kinds of organizations and all aspects of life. According to Gibb (2000), the overall challenge for the entrepreneurial society is to ensure that there are abundant role models for individuals to follow, wide opportunities practicing of entrepreneurial behavior, local empowerment to enable things to happen, a belief in “trust” for regulations to be minimized and encouragement at all levels. According to Lunstrom and Stevenson (2005), successful policies for entrepreneurship should take into account three primary aspects through an integrated approach: *motivation, opportunities, and skills*. The objective of the policy should be the businesses that are in pre-start or those who are at an early stage of the beginning of the entrepreneurial process. Policies should be designed and implemented in a way to address the motivation, opportunities, and skills, with the main goal to encourage more people to consider entrepreneurship as a chance (Lunstrom and Stevenson, 2005).

3. Methodology

In order to have a comprehensive analysis of the issue in this paper within the established hypothesis, we use an integrative methodological framework that consists of three levels:

- The first level: a review of the existing national and local policies;
- Second level: creating a database on the representation of Roma beneficiaries of policies and programs for entrepreneurship development in Macedonia;
- Third level: a collection of primary qualitative and quantitative data and processing.

The objective of the first research level was to review which policies are directly or indirectly related to entrepreneurship. For the purpose of the second research level 23 requests for public information were sent, to the relevant institutions that implement policy measures for employment and self-employment (Ministry of Labor and Social Policy, 2014, 2016). However, despite Article 4 and Article

12 of the Law on Free Access to Public Information, only 8 out of 23 requests were answered. Among other things, part of the information provided by the public information holders were not consistent, and others were incomplete. Regarding the third research level, a specific questionnaire was designed that included seventy-five (75) questions aimed to provide information and review the current situation of the socio-economic status of the Roma entrepreneurs and non-Roma entrepreneurs. The interview survey covered a sample of 20 formal and 100 informal Roma entrepreneurs (Roma lead/owned businesses), and 120 non-Roma entrepreneurs (lead/owned businesses) in order to provided sample for comparative testing of the set hypotheses (during 2016). The sample covered geographical coverage of ten (10) towns in Macedonia, equally represented and taken into account the gender equality.

In addition, six (6) interviews with municipal representatives within the sector of local economic development and/or municipal councilors were conducted. The purpose of the interviews was to identify whether the municipalities covered by the research, within their strategies for local economic development have any specific programs and/or measures for development of entrepreneurship and whether Roma is specifically covered therein.

The sample of the research was randomized in order to avoid bias. The methodological framework of the survey is based on the use of cluster technique for data collection. The cluster technique of data collection was chosen because it offers a quick and economical approach for data collection while covering large population sample, which is the case with our research. Additionally, it takes advantage of the techniques of random stratified sampling of the data (Agnesti and Kateri, 2011). After analyzing the research design and the database, the most suitable test for the testing our hypotheses used was a Chi-Square test of independence, also known as Pearson Chi-Square test. We use Pearson's parametric instead of the Spearman's non-parametric test because we want to avoid the possibility to over-interpret the Spearman's rank correlation coefficient as a significant measure of the strength of the associations of our variables that we test (Hauke and Kossowski, 2011). The Chi-Square test of independence test is used to detect whether there is a relationship between two variables, or whether one variable affects the other and vice versa. In addition, it allows us to evaluate whether these two variables that we measure for Roma and non-Roma are independent of each other. To use this test as with any other statistical test requires the database to satisfy certain assumptions in order to get a valid result. Since we use the parametric Pearson we wanted to be sure that the data set satisfies the normality, linearity and homoscedasticity assumptions. Data set did not show neither heteroscedasticity nor outliers thus, there was no risk of skewing the results of the correlation. Further, the independent variables in our

database consist of categorical independent groups and the two variables are measured in nominal or ordinal scale, in other words, the data are categorical thus, it was determined that these assumptions are met, and the Pearson Chi-Square test of independence can be used.

4. Results and discussion

The Pearson Chi-Square test results presented in the Table 1 indicate that:

- The perception of Roma as entrepreneurs is statistically different depending on the ethnicity of those who observe.
- There is a statistical significance in the fact that the “choice” of the ethnic group of employees depends on whether employment seekers are Roma or not.
- Statistical analysis shows that there is no perception that doing business in Macedonia depends on ethnicity and cooperation in business does not depend on whether the associates/collaborates are Roma or not.
- There is statistical significance in the perception for the Roma as entrepreneurs depending on the fact on which ethnic group you belong to and whether Roma has an affinity for entrepreneurs depending on the point on which ethnic group you belong to.

Table 1. Pearson Chi-Square test results: Roma vs. Non-Roma pairs

Pearson Chi Square Test	Pearson Chi-Square	df	P value	Phi Coefficient	Statistical significance at
Occupations of Roma	11.039	4	0.026	0.264	5%
Associates/ Collaborators Roma	13.469	3	0.004	0.292	1%
The ethnicity is a problem for cooperation	2.205	1	0.137	-0.118	None
Differences in running a business between Roma and Non-Roma	0.420	1	0.516	0.053	None
What makes Roma different	30.515	4	0.000	0.388	1%
Affinity of Roma for entrepreneurship	5.308	1	0.021	0.161	5%

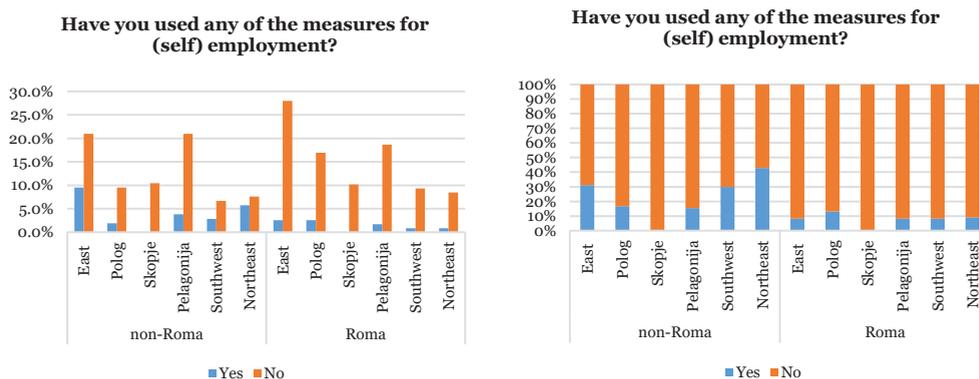
Testing the hypotheses shows:

Hypothesis 1: The current policies for entrepreneurship had a positive effect on the development of Roma entrepreneurs and contributed to the socio-economic inclusion of Roma in Macedonia;

In order to test this hypothesis, it is analyzed how many of the respondents were or are beneficiaries/users of any of the programs aimed at developing the

entrepreneurship in Macedonia. Only 15.7% of the surveyed respondents are users of some measure provided for entrepreneurial development. According to data obtained from individuals who have used or are currently users of any of the measures/incentives, 57.1% are Macedonians, 11.4% Albanians, 2.84% are Turks, and 28.5% are Roma.

Figure 1. Regional representation of the beneficiaries/non-beneficiaries of the employment measures, Roma vs. non-Roma



Source: Data from the field research, survey, 2016.

The field research, primary data collection through surveying 240 respondents-entrepreneurs⁵ (of which 120 are Roma, 120 are non-Roma including potential i.e. still informal as well as formally registered legal entities), provided with the question of whether they are users of any of the employment/self-employment/entrepreneurship measures 16% answered affirmative, while the remaining 84% responded negatively. The largest number of users of the measures based on the survey responds, are residents of the East planning region (which is at the same time with most of the percentage share in the sample as well). Out of the Roma entrepreneurs 8.5% have been using the activation measures for self-employment, with largest representation of the Roma in the East and Polog region (2.5%), followed by Polog (1.7%) and the remaining regions with below 1%.

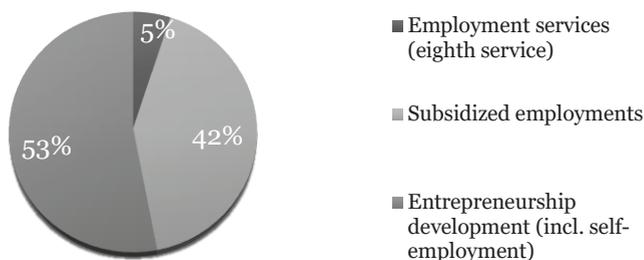
Out of those entrepreneurs (potential and existing) who are not users/beneficiaries from the measures nor have applied to use them, the main stated reason is: 36.6% are not interested, 18.3% stated that the reason is the

5 At this survey and analysis, CEA and IRIZ study aspect of “otherness” which is defined as a negative attitude followed by social labeling of Roma identity with various negative phenomena that are not part of the Roma identity, meaning Roma unconsciously adopt as part of their identity.

perception that programs and measures favor a particular group of people, while 16% of respondents—entrepreneurs as a reason indicated that the programs and measures are not adequate for their needs (do not fit). The largest percentage of those individuals who stated that are not informed, are Roma respondents. Entrepreneurs of Roma ethnicity, state that the lack of usage of the programs and measures is due to lack of interest 33% and 24% due to lack of information, however a high percentage of Roma consider policies and programs “favoring” a particular group of citizens 22.1%.

Regionally⁶, considered Roma and non-Roma, most often stated reason for non-usage of the activation measures among non-Roma is the lack of interest, while among Roma is the lack of information for the existence of the measures and the manner of exploring such an opportunity. Most evident is the claim of lack of information in the regions of Skopje (50% of the respondents claimed that that the lack of information is the reason for the lack of usage), Eastern region 30%, and Southwest 27%.

Figure 2. Utilization of programs/measures



Source: Data from the field research, survey, 2016.

The lack of interest on the other hand is most evident among Roma entrepreneurs from Pelagonija with 50% of the respondents replied that there is no interest, and with replies with 30% from the respondents of Polog and Northeast regions.

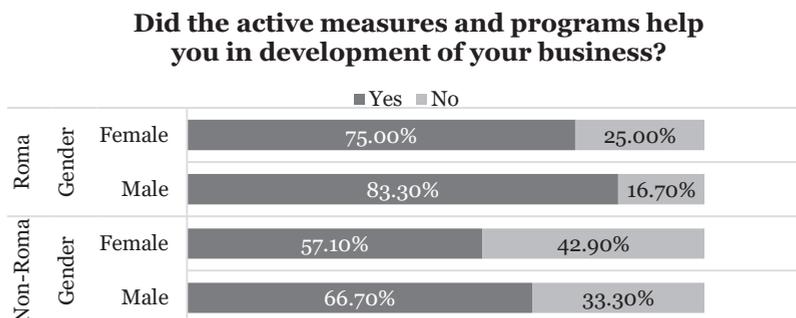
The perception for potential favoritism is pronounced among Roma respondents compared with non-Roma, especially among Roma entrepreneurs from Northeast and Southwestern region (30% and 27% of the respondents from the respective regions) noted as the major reason for not using the measures.

The policies intended for development of the entrepreneurship through specific programs and measures, most commonly used among the entrepreneurs

6 Considered ten local self-government units (LSGU) within the eight statistical planning region in Macedonia.

is *Entrepreneurship Development*⁷, followed by the program for *Subsidized Jobs/Employments*⁸ and the least used program is *Employment Services*⁹. Roma community most commonly is a beneficiary of the program i.e. measures for *Entrepreneurship development*, while among other non-Roma ethnic groups most commonly are beneficiaries of the measures and program of subsidized jobs, which can indicate the level of interest, as well as the affinity for entrepreneurship.¹⁰

Figure 3. Impact of the measures on business development, by gender and ethnicity



Source: Data from the field research, 2016.

Out of the interviewed Roma entrepreneurs users/beneficiaries of any of the measures only 16.7% reported that their socio-economic situation has not improved, while 66.7% of them believe that the usage of the measures aided to the improvement of their overall social and economic conditions. This indicates that the users of any of the measures for promoting employment, are to a

- 7 The program includes a sub-program for self-employment and sub-program for self-employment of persons with disabilities.
- 8 The program includes sub-programs to support the growth of micro and small enterprises to create new jobs, financial support for labor mobility program for conditional cash compensation for subsidized employment of disadvantaged individuals, subsidized employment for unemployed by exempting from contributions / personal income tax (project “Macedonia employs”), subsidized jobs for disabled persons.
- 9 The program includes the following eight types of services: Assistance with job search, Motivational Training, Employment mediation services to employers, preparation for employment and work, Professional orientation and career counseling services to activate the individuals at risk of social exclusion Education to use the online services of the ESA.
- 10 Here we are not entering into the issue whether the interest in establishing or formalizing own business is the result of entrepreneurship “necessity” or entrepreneurship “opportunity”, which according to other research (GEM Report 2013) in Macedonia 61% of entrepreneurs are belonging to entrepreneurs by “necessity” which is the highest percentage in the region.

greater extent perceived as positive for the socio-economic inclusion. Although in a smaller number, the pronounced positive perception is especially evident among Roma entrepreneurs in Polog and Pelagonija regions. However, still the prevailing number of potential and existing entrepreneurs will not attempt to engage into applying for the usage of any state policy entrepreneurship or self-employment measures. This can be an indicator for a needed review/evaluation of the existing measures and potential altering of the system as well as eligibility criteria for a greater inclusion, taking into account the socio-economic and cultural characteristics of the target group, regardless of the region.

The perception of the effect of the measures when analyzed by gender and ethnicity (from the population of the respondents) indicates positive experiences among the beneficiaries of the measures, significantly more pronounced among female users in terms of the effect on developing their businesses activities, compared to the male users/recipients, although the absolute number of women beneficiaries is two and a half times lower than the number of male users (regardless of the ethnicity). The positive perception of Roma female is pronounced among the female entrepreneurs in East planning region (beneficiaries), where all (3) female Roma respondents, users of the self-employment measures, consider them having a positive effect on the development of their business.

The general conclusion, considering the overall data, is that the perception of the entrepreneurs for the current policies (through the programs and measures) have not contributed enough to the development of entrepreneurship among the Roma. Observed by ethnicity, the entrepreneurs of the Macedonian community have a positive perception of the impact of the policies on the development of entrepreneurship. However, it should be noted that the programs and measures are not a major factor for the development of entrepreneurship, and this study does not take into account all factors that may influence the development of entrepreneurship, as well as for promotion of the existing businesses and to development of new businesses.

Replying to the question of *whether the active measures and programs have helped in the development of your business*, 68.6% of the interviewees answered that they believe the active measures have contributed in development of their businesses, while 31.4% believe that the active measures had no effect on the development of their businesses. According to Table 2, the Roma community has the highest level of positive perception of the effects on the development of the business, since 80% of the entrepreneurs believe that the public policy measures have helped in the development of their business, while 20% of Roma entrepreneurs believe that the measures have not contributed to the development of their businesses.

Table 2. Contribution of programs in business development by ethnicity

	Yes	No
Macedonians	70%	30%
Albanians	50%	50%
Turks	0%	100%
Roma	80%	20%

Source: Data from the field research.

Considering the perceptions for the level of contribution of the measures to the profitability of the businesses, 42.9% reported that due to being a beneficiary of the measures the business has increased their profits, 40% believe that there is no effect on increase of the profits, while 17.1% do not know or are not sure of the effects on the profitability of the business whether the increase or decrease of the profits is due to the measures considered or some other factor. The positive perceptions for the profitability of the business due to the usage of the measures are evident among the users in the regions: East planning region (62%), Southwest (50%), Pelagonija and Polog (40%). Among Roma it is pronounced among the Roma users in the East planning region, Southwest and Northeast planning regions. While the “no effect” on the profitability is evident among Roma users in the regions Polog and Pelagonija.

Table 3 shows that considering the ethnicity, 50% of Roma entrepreneurs believe that their profits increased due to the state measures and programs, while 40% believe that these have not contributed to increase of the business' profitability.

Table 3. Increasing profit by utilization of the programs

	Yes	No	I do not know
Macedonians	40%	40%	20%
Albanians	50%	25%	25%
Turks	0%	100%	0%
Roma	50%	40%	10%

Source: Data from the field research.

Note: The percentage of the Turkish community are not relevant for this specific question since only one (absolute number) has been a beneficiary of the considered entrepreneurship/self-employment measures.

One of the key questions to test the first hypothesis, is the question *whether by being a beneficiary of the program i.e., measures have improved the socio-economic situation*, of the respondents - entrepreneurs. 25.7% answered

positively, 31.4% answered negatively, and 28.6% said that maybe by being a beneficiary of the measures their socio-economic situation has improved, while 14.3% do not know. From the cross-analysis of data, it can be noted that 30% of respondents of Macedonian ethnicity believe that by being a beneficiary of the measures, these have contributed to the improvement of their overall socio-economic conditions, while 60% of the Roma entrepreneurs believe that measures and programs did not contribute to the improvement of their socio-economic situation.

Table 4. Improving the socio-economic situation after the use of the programs

	Yes	No	Maybe	I do not know
Macedonians	30%	20%	10%	10%
Albanians	0%	0,0%	25%	75%
Turks	0%	100%	0%	0%
Roma	30%	60%	10%	0%

Source: Data from the field research.

Note: The percentage of the Turkish community are not relevant for this specific question since only one (absolute number) has been a beneficiary of the considered entrepreneurship/self-employment measures.

Conclusion H1:

- The perceptions of the entrepreneurs in regards to the current entrepreneurship policies are divided, while some of the interviewees believe that the programs and measures did not contribute to the development of entrepreneurship, others have the opposite perception.
- The measures and programs did not contribute to the improvement of the socio-economic situation of the majority of respondents. Specifically by ethnicity the Roma and Macedonian entrepreneurs indicate a perception that the programs and measures have had a positive impact on the development of entrepreneurship. Nevertheless, it is important to note that the considered programs and measures are not the main and only factor for the entrepreneurship development. This research does not take into account all factors that may influence the entrepreneurship development and leaves room for further research on the effects of the policies aimed at improving the already established and developing new businesses.

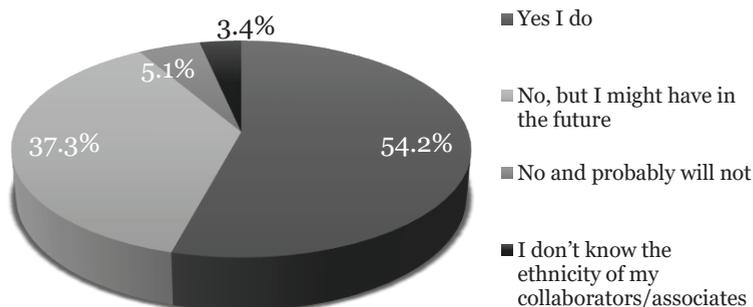
Hypothesis 2: Business operation in Macedonia contributes to the development of the concept of 'otherness'.

The second hypothesis discusses and considers the mutual relations between entrepreneurs from different ethnic communities. The first important question

for testing the second hypothesis is whether entrepreneurs that are Non-Roma have associates of Roma ethnicity. The results in Figure 4 show that 54.2% of the non-Roma entrepreneurs have a Roma associates/collaborators while 37.3% of the respondents answered that they do not have a Roma associate, but might in the future. In addition, 5.1% of the respondents do not have a Roma business associate and are not likely to have in the future, while 3.4 % of the respondents answered that they do not know the ethnicity of their cooperators. However, 21.9% of the non-Roma respondents refused to respond to this question, which indicates that non-Roma entrepreneurs do not want to speak openly about the ethnicity of their associates, especially Roma.

On a regional level, the most notable declaration that one does not have and will likely not have Roma associate/collaborator in the future is in the regions of Pelagonija where 18.2% of the region respondents (that is 3.4% of all non-Roma respondents) and 5.6% of the non-Roma respondents in the East region (that is 1.7% of the total number of non Roma respondents) state their perception of (non) accepting Roma as collaborators.

Figure 4. Do you have a Roma associates?

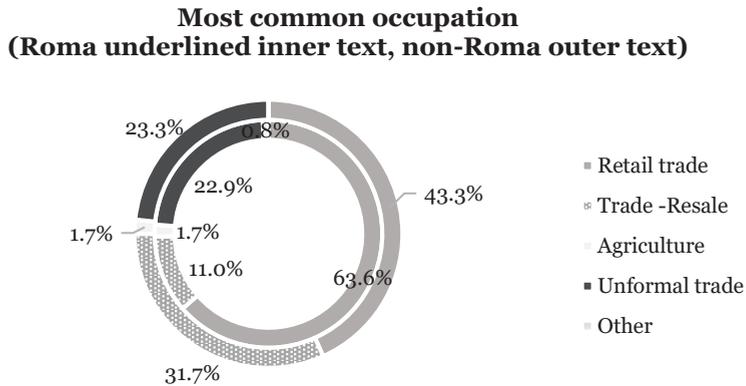


Source: Data from field research.

The presented results in Figure 5, show that 63.6% of the Roma respondents have the same opinion with 43% of the non-Roma respondents i.e. believe that the Roma entrepreneurs are mostly engaged in retail trade. Both Roma and non-Roma respondents believe that most frequent occupation of Roma entrepreneurs is the informal trade/operating in the shadow economy. 32% of non-Roma entrepreneur believe that Roma are dealing with resale/wholesale, while 23% think that they mostly deal in informal trade. Most of the Roma entrepreneurs' respondents (63.6%) believe that Roma entrepreneurs are engaged in retail trade and informal trade. There is almost no significant difference in the perceptions

of Roma and non-Roma about the business occupation or engagement of the Roma entrepreneurs.

**Figure 5. Perception of the most common occupations
Roma vs Non-Roma**



Source: Data from field research.

Regionally, within the country, the non-Roma respondents generally around 25% believe that Roma are mainly functioning in the informal economy trade, while only in the Northeast region this is much higher that is 67% of the regional non-Roma respondents believe that Roma are working in the informal sector. In the Southwest none of the non-Roma respondents did not mention the shadow economy as key occupation of the Roma in the region. The remaining percentage in the other regions there show no significant deference than the other respondents i.e. the general perception is that Roma are working in the retail and trade sector.

Furthermore, it may be noted that there is almost no difference in the perceptions of Roma and non-Roma respondents in regards to the Roma most common vocation/occupation. Namely the very high perception of the shadow economy is also very high among Roma about themselves in the Northeast planning regions reaching a level of 46% of the surveyed respondents, and 35% among Roma in Polog region, while in the remaining regions Roma perception of the activities in the shadow economy is again in the average percentage of 20%-25% of the Roma respondents.

One of the reason for this particular perception can be explained by the presence of the concept of “otherness”. In other words, as the previous hypothesis has shown, the non-Roma entrepreneurs believe that the key issue for the Roma entrepreneurs is their low education level, that consequently might be a reason for the perception of the non-Roma respondents, that Roma entrepreneurs are

mainly engaged in retail, resale, and informal trade, i.e. vocations that do not require a higher education level. The possibility to interpret the above perception created among non-Roma respondents, can be supported by the answers from the open ended questions that highlighting that “a good economic climate is needed, and Roma entrepreneurs are good «*tezdadzii*»¹¹”. Such answers provide insights on linking the Roma entrepreneurs with informal trade, which usually influence the Roma themselves to create a perception that indeed the informal trade is the common occupation that characterize them as entrepreneurs.

The entrepreneurs in Macedonia have a perception that Roma has an affinity (natural inclination) for entrepreneurship. This perception is much more emphasized among non-Roma entrepreneurs compared to the perception of Roma entrepreneurs. In fact, 79% of the sample of the potential and existing entrepreneurs who are not members of the Roma community responded positively to the affinity of the Roma as entrepreneurship (versus 15% that gave a negative response), while 26% of Roma entrepreneurs responded that Roma have no affinity for entrepreneurship. Regionally within the country, the positive perception of non-Roma for the affinity of Roma for entrepreneurship is evident among the regions of Northeast (93%), Southwest (90%), Polog (83%), etc. while the negative perception for lack of affinity among Roma is mostly pronounced among Roma in the regions of Skopje (58%) and Northeast (46%)

The perception that Roma do not have an affinity for entrepreneurship is mostly emphasized among Roma female respondents with 44% while by the other categories by ethnicity and gender (Roma male and non-Roma male and female respondents) is indicated in a range of 14% to 17%. This is especially noticed among Roma female in the East region (14% of the total 44%, or 44% of the female Roma respondents), Skopje (9% of 44%, or 67% of all region female Roma respondents), Northeast (7% of total 44%, or 43% of the region female Roma respondents). This result implies the need for working and motivating Roma women entrepreneurship and raising awareness about the benefits of entrepreneurship taking into account the importance of the social norms and the role of the family in decision making in family businesses, regardless of ethnicity and gender (over 60%).

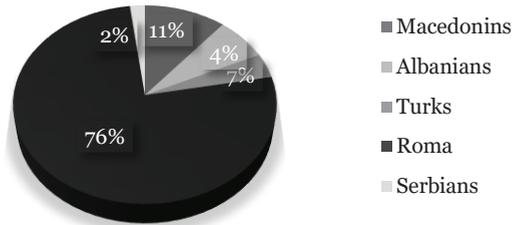
It should be further noted that the question: *Reason for starting own business operation indicates* that for the non-Roma this is most often motivated by the existent experience and the desire for independence and much less as a result of innovative idea or other “there is no other option”, while for Roma respondents the other “there is no other option” is highly more pronounced (31% of all Roma respondents) and it is the main reason for own business operations,

11 A term for stallholders mainly used in the context of indicating informal trade.

indicating the development of entrepreneurship based on “need” rather than by “want”, which is more evident among Roma than non-Roma (8% of all non-Roma respondents).

Figure 6. The perception on the ethnicity as an obstacle for cooperation in business

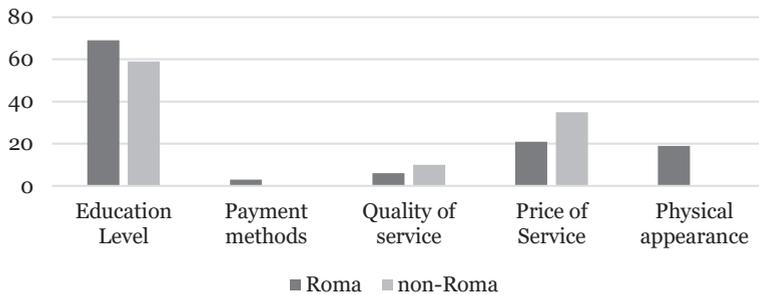
The ethnicity is an issue for collaboration with my business



Source: Data from field research.

Figure 7. The perception of the Roma and non-Roma on the difference between them as entrepreneurs

What makes Roma entrepreneurs different than non-Roma entrepreneurs



Source: Data from field research.

For two-thirds of the entrepreneurs in Macedonia the ethnicity (of the employee, customer, business collaborator, associate etc.) is not an obstacle for cooperation, while for 31% the ethnicity is an obstacle. In contrary, 76% of the Roma respondents think that the ethnicity is a barrier for the business cooperation. While regionally, the ethnicity as barrier for cooperation is noticeable among 17% to 33% of the region non-Roma respondents, this is in much higher percentage among Roma respondents from 73% to 22% depending of the regionally surveyed Roma entrepreneurs. This is especially noted among

Roma entrepreneurs in the regions: Northeast (73%), Skopje (58% of the regional Roma respondents), and Southwest (50%).

Regarding the question *What makes the Roma entrepreneurs in Macedonia different than the non-Roma?*, the most frequent answers by non-Roma respondents, or 57% is the lower education level, for 34% was the (lower) price and for 10% is the (lower) service quality. Regionally, there is some difference of the average among the non-Roma in Skopje planning region, where the leading response is lower price of the service. In addition, the Roma entrepreneurs also believe that the level of education makes them different from the non-Roma entrepreneurs, as a leading factor in each region as well, while 16% believe that their appearance makes them different, and 18% noted that it is the price of their service/product as a reason of being different from non-Roma entrepreneurs.

Through examining the inter-relationship of different ethnic communities, the results show that the entrepreneurs' answers indicate that they have or would like to have Roma business collaborators. However, a fifth of the respondents refused to answer the question.

Conclusion H2:

- According to the non-Roma, the occupation of Roma is defined by the level of education.
- Non-Roma do not have a very large number of Roma associates and believe that Roma have an affinity for entrepreneurship and that the affinity is usually directed towards the activities of trade and resale.
- According to the non-Roma respondents, the business occupation and engagement of Roma depends on their level of education.
- The non-Roma have a few Roma associates and think that the Roma have an affinity for entrepreneurship, usually followed by engagement in trade and resale.

5. Conclusions

The direct engagement of Roma in the policies and measures for development of the entrepreneurship in Macedonia as users/beneficiaries is limited since relatively low number of Roma are beneficiaries of the programs and measures for promoting employment and entrepreneurship, compared with the number of Roma who applied for using the same programs and measures. This low passing rate, might indicate the existence of predetermined eligibility criteria causing adverse selection that do not correspond with the characteristics and needs of the potential Roma entrepreneurs. At the same time, Roma entrepreneurs are only partly acquainted with the measures and programs which are part of the public policies for self-employment/entrepreneurship (24% are not informed/

aware of the existence of the programs and measures at all) and consider that there is a favoritism of groups when allocating the funds (22%).

The perception among a significant number of the interviewed Roma entrepreneurs (formal and informal) is that the offered programs and measures will not significantly help them to develop their business, however have contributed to the general development of entrepreneurship among Roma, but question the sustainability of the businesses. The unsustainability is affected by the (uncertain) financial conditions subsequently to the use of the programs, i.e. the limited viability of the business idea in the long run.

The perception of non-Roma for Roma entrepreneurs is that the (lower) education level is the most significant obstacle for an increased social and economic inclusion, and their occupation is defined by their level of education, and as a main reason for the limited socio-economic inclusion of Roma through entrepreneurship development.

The social norm (opinion of the nearby environment) of all entrepreneurs in Macedonia, regardless of nationality, is the first factor in business decision making (over 60% stated that the family is a primary factor in business decision making. Significant portion of non-Roma entrepreneurs perceive Roma community with an affinity for entrepreneurship (79%) compared to the negative perception of the Roma themselves which is particularly pronounced among Roma women.).

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SOCIAL INNOVATION AND COMPETITIVENESS – A LITERATURE REVIEW OF THE THEORETICAL WORK IN THE FIELD

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Abstract: *Competitiveness has become a major topic of economic and business studies over the last 20 years. In the 1980s, the focus of the study on innovation and competitiveness was corporate-level analysis. Subsequently, the focus shifted towards examining the role of larger communities, as the innovation performance of the community is decisive. The identification and study of actors involved in the implementation of innovation is of utmost importance for successes, and creates the need for investigation at multiple levels. In addition to the company's innovation capabilities, the innovation potential at regional and national level is also relevant. One of the features of successful companies is the complex interpretation of innovations (continuous and radical innovations simultaneously), which gives them a competitive advantage. Innovation is connected to the unique value, creating the competitive advantage that is decisive for competitiveness of an organization, region or even national economy. But there is the question: how can innovation be quantified in the development of competitiveness. In this paper we concentrate on social innovation and its connection to competitiveness at micro, mezo and macro level and the paper represents a literature review of the theoretical work in the field.*

Key words: competitiveness; social innovation; measurement

JEL Classification: I31; L10; O35

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1. Introduction

Under market economy conditions economic actors are competing in order to get the most favourable responses from their customers. To achieve and maintain customer satisfaction is a precondition of successful business activities. These development tendencies have led to the study of competitiveness over the last 20 years. Competitiveness has been studied at different levels: the competitiveness of nations is evaluated in each year by international organizations. Mezo-level studies concentrate on regional or branch level competitiveness issues. There is an understanding however that either national or industry/regional competitiveness is determined by the level of competitiveness of enterprises.

In periods of rapid technological and social innovations competitiveness is strongly dependent on innovation. So innovation-focused strategies are becoming today more important than cost-cutting strategies. Although Schumpeter has defined innovation in a broader sense, including market and organizational innovations as well, studies have frequently left out of consideration the economic, managerial and social elements of innovation.

During the last 15 to 20 years social innovation has emerged as a major area of studies in innovation. Competitiveness studies are connected to analysis of living standards. New and up-to-date solutions are necessary for smaller communities (regions, settlements) and social innovation can provide means for improving their conditions. The role of social innovation has increased due to two reasons:

- shift from industrial society toward knowledge and service based society,
- the natural needs of periferial settlements to catch up (local initiatives as possible solutions).

Social innovation may contribute to improvement of competitiveness and through that to increasing of living standards and quality of life.

In this paper, we concentrate on social innovation and its connection to competitiveness at micro, mezo and macro level. We examine the role of enterprises, the local communities and the national economy in competitiveness and the impact of social innovation for development of competitiveness.

The paper examines the phenomena of competitiveness and social innovation. Competitiveness can be defined as the capability to compete, to acquire position in the competition and long-term sustainability. Unit of measurement means the success rate recorded, measured in a particular way, the size of the market share and the degree of profitability. The concept of competitiveness at the micro level means to gain position in the market competition, the ability of companies to compete with each other, and from a macroeconomic point of view between individual economies (Török, 1999).

Social innovation is a new or novel answer to the problems of a given community in order to improve well-being. Social innovation potential is the sum of the potential abilities that help to create social innovations (Benedek *et al.*, 2015). In addition to technological innovations of the 1980s, innovations that sought to increase the well-being of the society and the community were the ones that have emerged.

Following the introduction, the paper starts with an overview of corporate-level competitiveness (on which national and regional competitiveness is based) and the role of influencing factors. We analyze the role of enterprise strategies and structures which can help in realization of competitive advantage. The paper identifies the role of adaptation of local norms and the growing organizational power of the local country in competitiveness. In this section (Section 2), we determine learning, adaptation to emerging new situations and flexibility as key elements of competitiveness. The paper analyses shorter and longer term time horizons for maintaining lasting competitiveness (Section 3). We examine the dilemma between exploitation and exploration (March, 1991). In Section 4, the paper determines the concept of social innovation in broader sense. Social innovation can be defined as answers to everyday challenges in community, while new collaborations are being created. Social innovation satisfies social needs and increases social activity at micro, mezo and macro level. The paper examines the connection between competitiveness and innovation, including social innovation and identifies innovations as complementary processes (Section 5). We analyze the role of innovation in competitiveness, distinguishing processes of exploration and exploitation. We determine the basic components of competitiveness, including innovation and examine Competitive Innovation Advantage (CIA). The paper attempts to quantify the impacts of innovation in competitiveness.

2. Competitiveness of enterprises

2.1 Determinants of competitiveness

Enterprise level competitiveness is influenced by both micro and macro level factors. At enterprise level we may emphasize the role of the following factors (Chikán and Czakó, 2009, p.80):

- production factors;
- demand factors;
- enterprise strategies, structures, competition;
- related and supporting sectors.

The above factors influence the capabilities of enterprises, which determine the possibilities for double value creation: to realize customer satisfaction and profit.

At macro level the following factors have to be emphasized (Chikán and Czakó, 2009, p.80):

- government;
- social norms;
- social institutions and the civil sphere;
- macoeconomic policies.

The micro and macro level factors together determine the level of productivity which may contribute to increased social welfare.

After drawing up the general framework of enterprise level competitiveness we turn our attention to the role of enterprise strategies and structures.

2.2 Strategies and structures for competitiveness

Michael Porter has defined three possible strategies for enterprises to realize competitive advantage (Porter, 1980):

- differentiation;
- cost leadership;
- focus.

Differentiation involves development of unique products and services meeting the needs of the top segment of customers. Competitive advantage comes from the possible higher prices if customers accept and value the unique characteristics of products and services.

Cost leadership strategy concentrates on reducing the costs of producing products and services, which gives possibility to reduce the prices. Competitive advantage may be realized by the increased volume of sales.

Focus strategies intend to concentrate on specific product-market segments and may be especially attractive for small and medium sized firms.

Competitiveness of enterprises is a dynamic phenomenon which is changing by passing time. In strong competition the least efficient forms are disappearing from the market, and competition is reorganized among the most competitive firms. On long term the competitiveness of an enterprise is determined by the development level of its technologies, and learning and innovation capabilities (Bernard *et al.*, 2007).

The strategic role of technology has got increased emphasis after the late economic crisis. As the crisis had arrived to its end, more and more scholars were interested in discovering what would happen after the crisis. Harvard Business Review has published a series of three papers in the March 2010 issue, dealing with “Strategy in a Weak Recovery”. The articles signed by influential authors like Pankaj Ghemawat, Ranjay Gulati, Nitin Nohria and others agreed that rather limited research evidence was available in the field and they tried to

get ideas by studying the experiences of the previous crises since 1980. Although the authors admit that the previous crises were much more limited in their expansion and were also different in their origin and nature, they had arrived to some conclusions worth of having in mind when thinking on possible future enterprise strategies. One of the important conclusions drawn by Gulati, Nohria and Wohlgezogen (2010) is that concentration only on cost-cutting during the crisis will hardly lead to successful expansion after the crisis (Gulati *et al.*, 2010, p.65). The authors found that emphasis on operational efficiency parallel with concentration on market development and asset investment had resulted in the best results measured by increase in sales income and EBITDA (Gulati *et al.*, 2010, p.67). More concentration on reduction of employment level and cost cutting has not resulted successful recovery after the crisis. It is also noteworthy from their studies that concentration only on innovation and asset investment during the crisis was not connected to successful enterprise performance after the crisis. So neither restriction nor mere innovation in itself seemed not to be the proper cure during the economic crisis. It is also a lesson to be beared in mind that rapid, short term solutions often have disadvantages evaluated by taking into account consequences on the lon run (March, 2013).

Ghemawat (2010, p.57) has forecasted the possibly more important role to adapt to local norms and the growing organizational power of the local country. Parallel with increased pressures on pricing, multinationals have to be sensitive to regional varieties of offering, as local differences become more important. These organizational changes will increase diversity within multinational firms, but at the same time increase the need for cohesive corporate cultures and tightening talent management practices (Ghemawat, 2010, p.60).

As a consequence of the accelerated changes and turbulence during the last few years, some authors speak about the next wave of creative disruption. Waldman in his recent book postulate: "In fact, growth of the mobile internet, the return of economic growth after 2012, and the constant potential for entrepreneurs to come up with products and services that satisfy fundamental consumer need are, I believe, going to drive another great wave of creative disruption in the near future. ... I predict that the era of creative disruption has only really just begun." (Waldman, 2010, pp.46-48).

The radical strategic changes possibly emerging during the coming years will probably have an influence on the organizational structures and processes companies will be adopting. Ringland *et al.* (2010, pp.90-92) speak about double-cone organizations where traditional hierarchy dealing with specified and routinized activities will be existing parallel with activities characterized by lack of clarity, ad hoc solution, private inspiration, and luck.

Summarizing the above discussed predictions, it may be perceived that there seems to be limited possibility for using previously prescribed solutions.

Learning, adaptation to emerging new situations and flexibility may be regarded as crucial capabilities organizations of the future will need in order to be competitive. Bahrami and Evans have formulated that requirement as follows: “The object of becoming super-flexible is to be able to either intentionally precipitate a transformation, or to make modifications in response to changing situations. Adaptation occurs either during the course of, or after, an unfolding change episode, and may simply be random in that one may be just at the right place at the right time.” (Bahrami and Evans, 2005, p.22).

3. Balancing shorter and longer term time horizons for maintaining lasting competitiveness

Studies of managerial behavior and time orientation often conclude that managers frequently provide preference for actions having influence on the performance of their companies on short term. So short term survival motivations outperform longer term innovation and renewal. This is the issue described by March (1991) as the dilemma between exploitation and exploration. Short term – even quarterly – interests of managers on producing financial results expected by share-holders.

We have rich ideas supported by theoretical arguments and empirical evidences under the heading of “ambidextrous organization” (Tushman and Anderson, 2004; Hakansson, 2010; Hakansson and Lind, 2004). The present authors are convinced that new insights into successful and unsuccessful business strategies either locally or internationally may be obtained after having deep level knowledge and understanding the above sketched area of investigation. The research work and the paper referred here by Hakansson and Lind (2004) opens up a new dimension of hopefully fruitful studies when drawing attention on the inter-organizational dimension of ambidexterity. Approaching the problem of how to meet the contrasting requirement of short term efficiency and longer term innovation we are often faced with the dilemma of “right or left hand” (see e.g. Leavitt, 1987). Some managers are encoded for managing by their inspiration and vision, named as path-finding manager by Leavitt (1987), while others prefer the well-structured approaches supported by rich empirical data and quantitative analysis.

4. Concept of social innovation

Defining the concept of social innovation, defining its levels and measuring possibilities are relevant challenges, but the literature on the topic does not or only partly address them. Social innovation is a process that promotes the well-being of the community and addresses the challenges that society faces. Its unambiguously accepted definition is not available. According to the definition

of OSLO Manual, social innovation can be interpreted as a concept that will result in satisfying needs in society, along with new or novel collaborations and structures. Innovation is a new or significantly improved product, process, marketing method or organizational method for business practices, organizations, or co-operation in a “widened” interpretation (EC 2006). The definition is primarily the guideline for technical and economic innovations, however, the European Union’s research, development and innovation policy (Horizon 2020) has already paid particular attention to the definition of social innovations. The main objectives of Horizon 2020 include “smart, sustainable and inclusive growth” (EC, 2014, pp. 7), which is also the basis for encouraging competitiveness examination.

Social innovation is interpreted as a process by which the quality of life and the development of life expectancy can be seen. Social innovation is a new solution (or new approach) that simultaneously satisfies the social need and enhances the capacity of society to act (Czakó, 2000).

According to the definition of the European Union (Lessa *et al.*, 2016), the concept of innovation can be interpreted on three levels, according to the degree of represented novelty:

- organizational / corporate level;
- regional or national level;
- innovation at international level.

Bulut *et al.* (2013) identify the micro-level goals of social innovation by meeting social needs, increasing living standards, developing individual or group capabilities that also determine the activities of organizations and companies. In their view, macro-level objectives are in line with the general change in society, emphasizing the importance of innovations aimed at eliminating inequality and the initiatives that result in sustainable development.

Pol and Ville differentiate between the micro and macro levels of quality of life. The micro level of quality of life enhancement, as the main objective of social innovation, is determined by individual conditions, while macro-level analysis requires an analysis of the conditions of a particular community (Pol and Ville, 2009).

The definition of the levels of social innovation is supported by the European Commission’s study of social innovation in the following cases and in the form of implementation (Nemes-Varga, 2015):

- social innovation as a bottom-up organization involving NGOs;
- social innovation as a response to social values to community needs;
- social innovation as a process leading to renewal and transformation of society.

The above categories demonstrate that the focus of social innovation efforts is to meet the needs of the community and to solve their problems, while the narrower idea is interpreted exclusively as a grassroots, citizen engagement process. Social innovations, which can also be found in the new approaches of society and in structural transformation, are often created from the top by the action of macro-level measures. This finding also predicts the grouping that differentiates the micro- mezo- and macro levels of social innovations.

5. Innovation and competitiveness

Longer term competitiveness is enhanced by the level of technological development, capability for learning and innovation capability (Bernard *et al.*, 2007, Hortoványi and Balaton, 2016). Barsi (2003) has pointed out that today competitive advantages are coming not from reduction of production costs, but from adaptation of technological, organizational and management innovations.

At enterprise level studies related to innovation have long concentrated on technological innovation. Product and process innovations were regarded as the two major areas of technological innovation. During the last two decades social innovation has emerged as a new area of innovation studies. This new development is partially explained by the fact that many empirical examples have shown that without social innovation the possibilities of technological innovations can only partially utilized. Introduction of new technologies often requires changes in organizational structures and processes. So economic and social innovations are equally important in realizing economic, social and technological development. Due to the expansion of innovative areas, innovations are complementary processes. Social and technical innovation are closely interrelated. If there is a change in the economy, it is necessary and lawful for social changes to occur. Social innovation is a necessary step to improve development and competitiveness, where innovators play a major role. Innovators are the local community or, in the broader sense, members of the society who, with their knowledge of their needs, solve social challenges as a new tool with their everyday challenges.

5.1 The role of innovation in competitiveness

The success of a given company depends on knowledge-intensive products that it produces, on creative market solutions to response to different challenges and on effective organization. In this approach, obtaining a competitive advantage that is indispensable to the organization depends on innovation activity. Innovation process leads from the idea to the realization, to the achievement of market utilization. It can be stated that those innovations are successful, which increase the organization's competitiveness. The main task of innovation

management is to develop the company's resources, competencies, different processes and programs, to form an innovation advantage on the market.

Birchenhall (1995) interprets innovation as technical progress and identifies innovation through a social learning process. He examines the learning process in a broader sense, one hand learning means reach of new knowledge, and on other hand learning is the spread of knowledge and new combinations. In our opinion, the former can be interpreted as a research strategy (exploration), while the latter is an exploitation, which combines and coordinates applications providing opportunity for effective innovation. A prerequisite for effective innovation is to achieve increased competitiveness and successful adaptation during application. The effectiveness of new ideas and new combinations can be verified during usage, and the potential of innovations is successful and can be successfully applied. According to the author (Birchenhall, 1995), innovation is a search process based on a novel combination of new ideas and existing ideas. The study points out that genetic algorithms (and neural nets) can use the selection operator to examine the processes that create technical changes under certain limitations. Birchenhall's model is well-suited to the well-being and competitiveness enhancement initiatives, which can be closely connected to the aspirations of innovations (including social innovations).

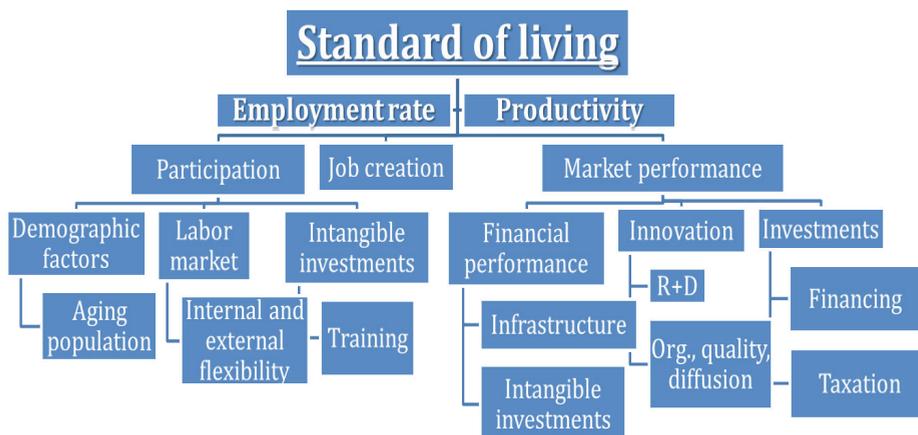
Simultaneously interpretation of continuous and radical innovations provides competitive advantage for enterprises. Innovation creates the unique value, and thus determines the competitive advantage that is decisive for competition for an organization, a region or even a national economy.

The main goal of increasing competitiveness is to increase living standards (Figure 1), while improving living standards is a function of high levels of employment and productivity. The starting point is to increase productivity, which is a prerequisite for more efficient technology. Technological development is driven by the promotion of R&D through the process of innovation.

Innovation, including the concept of social innovation, is an important factor in determining competitiveness. In the 1980s, the focus of the study on innovation and competitiveness was corporate-level analysis: firstly, innovations appeared at this level and, in general terms, the competitiveness of companies anticipates the country's competitiveness as well (Hortoványi and Balaton, 2016). Within the organization, you must constantly look for opportunities for development that can be shaped by innovation competition. The concept of Competitive Innovation Advantage (Hülsmann and Pfeffermann, 2011) is compounded by the concept of increasing success and competitiveness. Innovation is a new type of multi-stakeholder process that, through its activity, achieves organizational development and growth in the form of responses to opportunities and dangers of innovation needs and constraints (Piskóti, 2012). The key to enhancing competitiveness is

the Competitive Innovation Advantage (CIA), and the tool for effective innovation portfolios. To increase competitiveness, it is not enough the exploitation of existing knowledge, but it is also necessary to develop a kind of research and exploration strategy that enhances the strength of each other as an “ambidextrous” strategy, providing the competitive advantage that is indispensable for sustainable growth.

Figure 1. The basic components of competitiveness



Source: Czakó, 2000.

Increasing competitiveness requires continuous development and development of opportunities within the organization. Innovation gives an answer to the questions of development opportunities and constraints. Innovation – in co-operation with organizational strategy and structure – provides an opportunity to realize the organizational goals required for effective implementation. However, the implementation of innovation often involves the modification of organizational culture. The goal is to make the new developments profoundly embedded in collective consciousness, trust, solidarity, enthusiasm and openness, and emphasize the key components of innovation (Jarjabka-Lóránd, 2012). The organization must find a balance between innovation activity and performance leading to continuous performance improvement. Innovation is not a goal in itself but a driving force for competitiveness and value creation (which is the long-term objective of companies) (Durand *et al.*, 2004).

Innovation – as a key element of economic development – is an important factor in social processes. Social innovations are seen as inseparable companions of technological innovations. Social innovation provides new solutions to the problems of the community in order to improve the well-being of the community, and as a tool to respond to challenges, it also provides a novel approach to

managing regional disparities. Technological innovations in core areas are a solution to the quality of life development issues, but in the backward, peripheral areas, it is necessary to encourage new initiatives such as social innovations.

5.2 Measuring competitiveness and social innovation

Examining the relationship between competitiveness and social innovation, the issue of measurement is an important factor. Competitiveness and innovation are linked, but there is the question, how can be quantified the role of innovation in competitiveness.

The starting points for competitiveness measurement are two international comparisons (Table 1): international compendium of International Institute for Management Development (IMD) on Competitiveness (55 countries) and the Global Competitiveness Index of the World Economic Forum (WEF) (GCI, 125 countries). The two methods show similarities and significant differences in their procedures and results (Szilágyi, 2008).

IMD compares 4 competitive factors with five additional factors, so it averages within 20 groups, and as a main result, the 4 group average (unweighted) is taken. Accordingly, multicollinearity can be better distinguished, as the average of the 4 competitive factors is less correlated.

The GCI index determines 9 (or 12) pillars which include a number of 6 to 23 variables. Both the pillars and the countries (according to their economic development) are differentiated in the index according to the following breakdown:

- factors of production (institutions, infrastructure, macroeconomics, health and primary education) are key factors in less developed countries;
- efficiency factors (higher education, market efficiency, technology) are the main elements in more developed countries;
- innovation as a factor of competition is dominant in the most advanced countries and the business environment.

Both methods pay special attention to innovation, and measuring innovation potential. The measurement methodology has been defined in a very different way in the field of natural sciences, technical innovations and social innovation. There are a number of methodological recommendations for the measurement of technical innovations (e.g. Community Innovation Surveys – an innovation survey carried out every two years in EU member states), but the question of measuring social innovation has not been clarified methodologically for the time being. The question is: what do we measure? The measurement of social innovation is also important in order to generate potential innovations that lead to increased competitiveness and to the achievement of a higher standard of living and well-being.

Table 1. Measurement of competitiveness

IMD				
Competitive factors				
	<i>Economic performance</i> (83 factors)	<i>Effectiveness of public activities</i> (77 factors)	<i>Business efficiency</i> (69 factors)	<i>Infrastructure</i> (94 factors)
<i>Part of factors</i>	domestic economy	state finances	productivity	general infrastructure
	international trade	tax policy	labor market	technological infrastructure
	foreign investments	institutional framework	finances	scientific infrastructure
	employment	legal regulation	management practices	health
	prices	social framework	business conduct and value system	education
GCI				
Piles				
	<i>Factors of production</i>	<i>Efficiency factors</i>	<i>Innovation factors</i>	
	Institutes, Infrastructure, Macroeconomics, Health and primary education	Higher professional education, Market efficiency, Technology	Business conditions, Innovation	
	Number of factors: between 6 and 23			

Source: Szilágyi, 2008.

Similarly to the indicators for competitiveness measurement (IMD, GCI), variable groups should be determined by factor analysis to reduce the number of indicators. Indicators supporting the measurement of technical innovations can help to produce indicators for measuring social innovation, but careful caution is needed during adaptation. On behalf of the Commission of the European Union, the TEPSIE - Growing Social Innovation project analyzed the indicators for measuring social innovation between 2012-2015 by cooperating with 6 european institutions. The project concluded that the indicators for measuring which are the two best input-outputs are not always suitable indicators (Schmitz *et al.*, 2013):

- patents: risky, not all cases,
- R&D activity: not observed in all sectors.

According to the study (Schmitz *et al.*, 2013), measuring social innovation, an integrated model needs to be able to examine the conditions (framework conditions), organizational activities and results in a complex way. In the analysis of the process of social innovation, it is crucial to identify the relationships that affect the interaction between the factors influencing the innovation activity (framework conditions and the impact of organizational activity on the outcome) and feedback loops in the innovation process (social innovation enhances the capacity to act and results in new innovations).

6. Conclusion

Increasing the standard of living, as a main goal, is displayed in examining competitiveness. Whether a company, a region or a national economy, competitiveness is closely connected to innovation and innovations have a key role to play in increasing competitiveness. The presence of natural science and economic innovations can be observed in core areas, however, peripherals are characterized by significant backwardness. New and timely solutions are necessary for smaller communities (settlements, regions) and social innovation could be tool and model for development. Nowadays, social initiatives and innovations have a prominent role. In addition to technical innovations social innovations are involved in the well-being of the community with their novel solutions and improve living standards. The importance of social innovation has increased for two reasons, thanks to:

- a kind of focus shift (from industrial society to knowledge and service-based society),
- the natural needs of peripheral settlements to catch up (local initiatives as possible solutions).

Researching competitiveness, productivity and employment are important in analysis, which determines the growth of living standards. In our opinion, one of the most important elements of a higher standard of living is the market share of companies. The more the market share is, the more sustainable is employment and productivity.

Increasing competitiveness, the exploitation of existing knowledge and developing a kind of research and exploration strategy are necessary that enhances the strength of each other as an “ambidextrous” strategy, providing the competitive advantage that is indispensable for sustainable growth. The key to enhancing competitiveness is the Competitive Innovation Advantage (CIA) which creates an opportunity to achieve and maintain customer satisfaction.

The paper examined connection between competitiveness and social innovation. In addition to technical and economic innovations, social issues are becoming increasingly important initiatives. Social innovation as a tool of improving well-being plays a decisive role in quantifying competitiveness, but

the methodology of measurement raises questions. In our opinion, the number of indicators need to be reduced. Similarly to indicators of competitiveness it is necessary to create variable groups by factor analysis and reducing the number of indicators. Not all of the known indicators are suitable measuring social innovation, patents are not always and R&D activity could not be observed in all sectors. An integrated model is needed that can examine in a complex way the framework conditions, organizational activities and results (these 3 factors can be detected in many measurement systems). The new measurement model is expected to be able to explain the interaction between the factors influencing the innovation activity and feedback loops in the innovation process that result new innovations.

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ANALYSIS AND IMPROVEMENT OF DATA QUALITY. IMPROVEMENT OF DATA QUALITY FOR BUSINESS PURPOSES

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Abstract: Data presents nowadays a high potential for innovation. Its usage is seen as the foundation of the digitalization process that became a trend in the past few years. For an effective use of the huge amount of data there is also a very important factor to be taken into consideration: the uncertainty of data quality. In the digitalization context, poor data quality can be seen as a threat to the value generated by the amount of data we dispose of. Moreover, poor data quality isn't only a threat for automated business processes but also an important factor for significant cost increase. Consistent and accurate data is mandatory for successful software. The aim of this paper is on the one hand, to outline the challenges related to the process of data quality assurance and data quality management and on the other hand, to put up for discussion an approach of dealing with data via ERP (Enterprise Resource Planning) Systems with the goal of improvement and optimization of the data quality for an efficient use of the business data.

Key words: data quality; data management; data validation

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1. Introduction to data quality

The amount of data was continuously increasing in the past years such that, according to the International Data Corporation forecasts, 40 ZB (1 zettabytes = 1 trillion gigabytes) of data will be generated by 2020. The attention of the industry, governments and academics has been already attracted for the past few years by the topic of big data research. In this context, a particularly up-to-date and of high importance research topic is the quality of the existing data.

There are many definitions of the “Data Quality”-concept, but in general quality of data is analyzed by the degree of its fitness for the intended usage in operation, decision making or planning processes (Redman, 2008, p.35). Another definition evaluates data quality by the capacity of correctly representing the reality construct to which it is related. If it is to define data quality by applying the ISO 9000:2015, this can be described as the extent to which a set of characteristics fulfills the requirements expected from the data.

The issue of data quality is not new. Actually, the growth of the importance of this topic in the past few years is due to the impact of poor data quality on decision making, organizational trust and customer satisfaction. In addition, the continuously increasing volume of data has driven the issue of data quality to a strategical level for the industry and to an important research field for the academics.

Data quality management became complicated because of several factors which changed in the past few years. First of all, the volume of data produced by the industry everyday became challenging to handle regarding the quality of the data. Secondly, the past years also presented an increase in the diversity of data. On the one hand, such diversity refers to the structure of the data. It could make a significant difference either we take into consideration structured, unstructured or semi-structured data. On the other hand, data provenience should also have been taken into consideration. Due to the use of various technologies, the amount and diversity of data being collected is continuously increasing. Another factor which affects the management of data quality could be the lack of a standard for the data encapsulation. Furthermore, difficulties are faced even in defining appropriate data quality metrics. As presented, several definitions of data quality are taken into consideration, that’s why it has become challenging to analyze and evaluate data regarding its quality.

For a better understanding of the content of this paper, the perspective of analyzing data quality should be set up from the beginning. Data quality is treated in this article as a critical component of business assurance, a decisive factor for increasing operational efficiency. Living the digitalization process, we should be aware of the fact that inaccurate or incomplete data threatens the process of

automated decision taking in companies. Decreasing of customer's loyalty, damage on company's reliability and financial loss are only few of the consequences of decisions based on poor quality data. Since it has been raised awareness regarding data quality even for CIO's due to the fact that almost 50 percent of a project budget might be spent correcting data based errors, data quality is nowadays one of the trending research topics even in the business sector.

In this paper, the authors will present a summary of literature findings regarding the research in the field of data quality and data quality management, the evaluation of data quality using several approaches founded by specialists in this field, the use of ERP-Systems (especially SAP-technology) for purposes of analyzing, improving and optimization of data quality assurance processes and a short description of a prototype application which should be integrated in SAP for improving the data quality management process.

2. Analysis of data quality

2.1 Literature review on data quality

Starting with the second half of the 20th Century, researchers began to study the concept of quality, especially the quality of products. Definitions such as, "fitness for use" (Wang, 1996), "conformance to requirements" (Crosby, 1988) were published.

Research focused on data quality started in the 1990s around the Professor Richard Y. Wang of the MIT University. Data quality was defined through the "fitness for use"-approach, while Professor Wang proposed that data quality is in a strong relation with the data consumers (Wang, 1996). In addition, a data quality dimension was defined as a set of attributes which should be seen as a single construct of data quality.

Alexander and Tate described in 1999 six evaluation criteria of data quality: objectivity, authority, accuracy, currency, coverage/intended audience and interaction features for web data. For information retrieval, Gauch proposed six quality metrics, including currency, availability, information-to-noise ratio, authority, popular-ity, and cohesiveness, to observe (Zhu, 2000).

Knight and Burn (2005) summarized the most common dimensions and the frequency with which they are included in the different data quality frameworks (Knight, 2005).

According to the U.S. National Institute of Statistical Sciences (NISS) in 2001, the main principles of data quality are: 1. data is a product, with customers, to whom they have both cost and value; 2. as a product, data have quality, resulting from the process by which data are generated; 3. data quality depends on multiple factors, including at least the purpose for which the data are used, the user, the time.

However, Wand and Wang summarized the research on the meaning of data quality by focusing on 4 intrinsic dimensions: completeness, unambiguousness, meaningfulness and correctness. For a better visualization of the factors measured in order to analyze data quality, Wand and Wang summarized the most often cited data quality dimensions as shown in the following table.

Figure 1. Data quality dimensions

Accuracy	25	Flexibility	5	Sufficiency	3	Informativeness	2
Reliability	22	Precision	5	Usableness	3	Level of detail	2
Timeliness	19	Format	4	Usefulness	3	Quantitativeness	2
Relevance	16	Interpretability	4	Clarity	2	Scope	2
Completeness	15	Content	3	Comparability	2	Understandability	2
Currency	9	Efficiency	3	Conciseness	2		
Consistency	8	Importance	3	Freedom from bias	2		

Source: Wang, 1996.

2.2 Impacts of poor quality data

By the rapid development of the technology, the volume of data is continuously increasing. This has enabled companies to collect and store large amounts of data so that, the process of managing these data has become more than challenging in the past few years. While initially, due to the inset of ERP-systems, it was thought that they can handle the lack of data integration, now it has been observed that since the ERP modules are intricately linked to each other, input of data characterized by poor quality from one module can affect the functioning of other modules negatively. Hence data of poor quality can imply several negative consequences for a company.

Table 1. Impacts of poor data quality representation

Indirect costs	Employee dissatisfaction, Data duplication	Focus on wrong market segments, Poor production planning
Direct costs	Wrong deliveries, Payment errors	Problems in efficiency, Long delivery times
	Impact on operational tasks	Impact on strategical decisions

Poor data quality also leads to the increase of operational costs since time and other resources are involved in the process of detecting and correcting errors. Since data are created and used in all daily operations of a company, data are critical inputs to almost all decisions and implicitly data defines common terms in an enterprise (Cai, 2015).

However, a common assumption is that accuracy of information or the data presentation layer has a major impact on the time it takes to make a decision as well as on decision-making performance. One of the most important factors of poor quality data is the risk of bad analysis. If the data is full of errors that means any data analysis being run could lead to completely wrong predictions. Another factor that comes as consequence of the precedent one is the missing data. Low data quality can also mean that the business doesn't have the proper data to analyze in the first place. As another consequence of low quality data is the lack of visibility. While having erroneous results from analyzing low quality data, the company isn't able to visualize correct trends in terms of economic forecasts and that will lead in the most of the cases to a loss.

Creating awareness of these issues within the industry was the first hindrance that was overcome when it was to implement data quality programs in companies. As clearer the consequences of low data quality were felt, the more rapid was the increase of interest in this research area. The techniques are obligatory to be improved and continuously developed so that they can successfully face the challenges of the Information Age.

2.3 Evaluating data quality

For the evaluation of the data quality we take into consideration a standard of five quality dimensions, also represented in Table 2: availability, usability, reliability, relevance and presentation quality. The last dimension was added as it was concluded that it increases customer satisfaction.

Table 2. Quality dimensions and data quality elements

Quality dimension	Quality element
Availability	Timeliness
	Accessibility
Usability	Credibility
	Accuracy
Reliability	Consistency
	Integrity
	Completeness
Relevance	Fitness
Presentation Quality	Readability

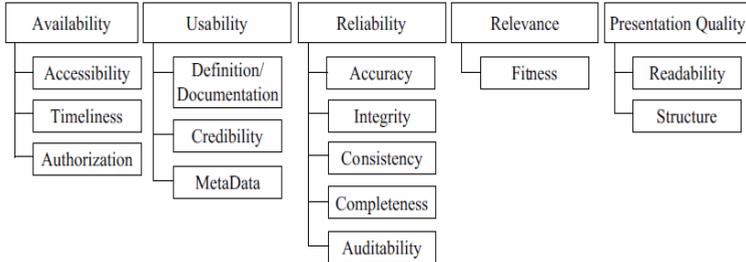
Source: Cai, 2015.

Each dimension is subdivided into quality elements, whose description will be given below as follows (Cai, 2015):

- *Timeliness* is the difference, measured in time, between the moment of data generation and the moment of data utilization.
- *Accessibility* measures the difficulty for a user to access the data. It can be often linked to authorization, so whether a system or a user has the allowance to access the data.
- *Credibility* it is used to evaluate the objective and subjective believability degree of the data. For the evaluation of these quality element there are taken into consideration factors like reliability of data sources, the time of data generation and the degree of data normalization.
- *Accuracy* can be measured, while the given data value is compared to a known reference value. There are cases in which accuracy can easily be measured such as bool values. In other situations, accuracy can be measured only depending on a given context. Therefore, data accuracy depends on the application context.
- *Consistency* measures the degree of completeness and correctness of correlated data. The same data, located in different parts of a database, need to be treated as being equivalent. If data elements are identically, data values need to be equal in order to keep consistency optimally.
- *Integrity* is given by the property of data to have a complete structure. Data values should respect a given standard by being defined according to a data model or a data type. In order to ensure data integrity, data values aren't to be changed in an unauthorized way.
- *Completeness* measures the validity of the components of a data element. An example provided in order to make clear the understanding of this quality element is the property color represented via RGB. If a value of the three (red, green, blue) is missing, the property of data completeness is hurt.
- *Fitness* measures properties of data taking into consideration two different aspects. In order to evaluate this property, it is taken into consideration on the one hand, the amount of data accessed by users and on the other hand the proportion to which the accessed data matches user needs.
- *Readability* is measured, while attributes, units, codes, abbreviations or other meta-data of a given data element is being evaluated.

For a better visualization of the explained criteria, leading to the evaluation of data quality there is also a graphical structure in which they are efficiently represented.

Figure 2. Data quality elements and dimensions



Source: Cai, 2015.

For the purpose and thematic field of this paper there are taken into consideration only several data quality elements out of all the explained ones. As the paper has as main scope the research and optimization of data quality for business purposes, the most important data quality elements which should be considered are: accessibility, credibility, accuracy, consistency, completeness, integrity and readability. All in all, data quality evaluation is to be concentrated on a selection of data elements and afterwards the concrete used properties are to be chosen supporting the need of the users.

3. SAP-technologies and data governance processes

The SAP Company offers for their customers the software solution SAP MDG (Master Data Governance) for the purpose of managing data. This software solution has two main components: SAP MDG, which stands for Master Data Governance Central Governance, and SAP MDC, the name of the module regarding Master Data Consolidation. The first one has as main focus the processes of generating, administration and quality assurance of the data. The main scope of the SAP MDC is at the same time the consolidation of data and the improvement of data quality. Considering, the two components as one software solution, it leads to a performant tool of data management.

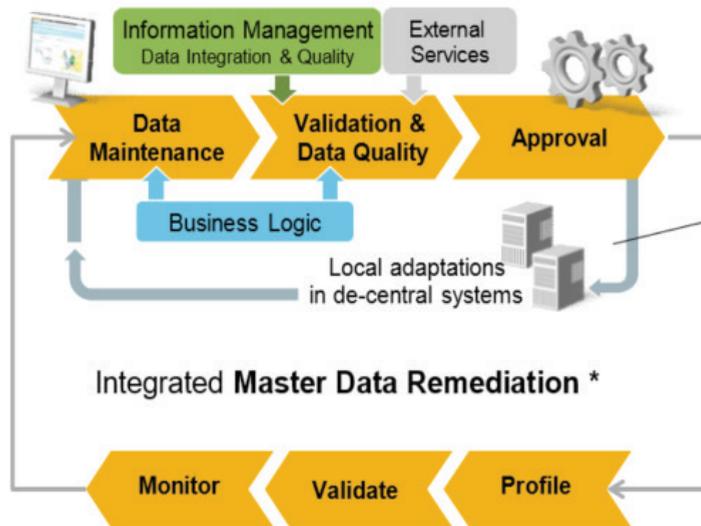
Related to the thematic area of this paper, we widened the scope of our investigation and therefore there should be given a brief description of the process of data governance. The governance process gives the possibilities of data creation and data maintenance. SAP provides the standard version of MDG with pre-built data domains, which can be enhanced by further domains from the user part. The module for data consolidation brings the possibility of aggregating data across sap and non-sap systems into one data repository. At the same time, the user is enabled to search for data across linked systems, to

analyze data objects and to increase data reliability with the purpose of using them for further processing.

Although there are also business challenges that will appear like: introducing the MDG in the organization as tool, the lack of transparency when it comes to a master data process execution in a distributed environment, viewing system wide transactional information of data objects and managing the data quality of the data objects.

For a better understanding of the whole process, there are precise steps to can follow. The initial state is to collect or optionally generate the data. The maintenance action applied to the data is efficiently implemented via MDG because it also allows to clean the data. The creation or the change of master data is not immediately recorded in the SAP table but in a request document, called change request. Only after the release of the change request the creation or change is effectively active in the SAP system.

Figure 3. Steps in the data governance process



Source: Farooqui, 2017.

As it is to graphically represent the governance process, like in Figure 3 there are six main steps to be taken into consideration (Farooqui, 2017):

- *Profile* - examining and collecting meta-information about data from a data source;
- *Validation* - ensuring that the analyzed data are clean, correct and useful for their further purpose;

- *Monitoring* - process, which assumes that data is proven against certain business rules in order to ensure data effectiveness;
- *Data maintenance* - changes are taken due to certain processes based on that data;
- *Validation and data quality* - based on business logic, data is proved again for validity;
- *Approval* - decides whether the analyzed data is “fit for use” for the defined business processes or other data is to be collected via profiling.

Another process which should be described in order to understand the whole data management process is data consolidation. If it is to explain the consolidation process, this could be split into five main steps (Vaishnavi):

- *Business case definition* - there are several factors to be considered such as the variety of the required data attributes, the standardization of the data structure or the project requirements;
- *Resources availability* - analyzing the available amount of data in order to reuse it;
- *Identification of best candidates* - critically analyzing all the resources and search for the element with the greatest return related to the given objectives;
- *Reconfiguration of resources* - reducing costs while reducing resources (data) and therefore replicate the features of the outdated information;
- *Evaluation of the goals* - after performing the consolidation of the data, there is as last step to check whether the initially fixed objectives are still appropriate or not;

Farther, as it should be clearly explained what the whole process of data central governance and data consolidation is assuming it should be also analyzed what the weaknesses of the SAP Governance solution are. Considering the main topic of the paper, improvement of data quality for business purposes, the focus will be on the difficulties of handling data quality within the data governance process.

SAP MDG’s main weakness is referring to the complexity of its design. SAP chose to implement a new concept of Entity Types with four different setup options instead of developing the existing SAP data dictionary based on a standard relational database technology. An Entity Type can represent a single data element or a group of data elements that share properties as it follows (see “Configuring Master Data Governance for Custom Objects”):

- *Entity of Type 1* represent root objects that are subject to governance and are used for modelling attributes and relationships. They are also being processed in the first step of the change requests.

- *Entity of Type 2* are used for entity types which are not available in the system. Moreover, they can't be processed via change requests but they can model key-enhancements for type-1 and type-4 entity types.
- *Entity of Type 3* are used for modelling external entities used in the data model. No processing in MDG is possible at all and no further modelling is allowed. They can model additional primary keys for the tables of type-1 and type-4 entity types.
- *Entity of Type 4* they are processed in MDG within the context of other entity types. They represent dependent nodes of objects to structure object data while they are to be processed on the UI together with the required leading type-1 entity types.

Concluding on the MDG process and the software solutions provided by SAP for the work field of data management, the outcome should be that there are enough opportunities for further development. Assuring data quality is a challenging task nowadays and therefore existing software solutions are to be constantly improved. As described above SAP MDG, due to its design complexity, has deflected from the principle of using a standard relational database technology. Therefore, a benefic improvement of the system would be the ability of analyzing data quality criteria of the data stored under the newly introduced entity types. Farther, this paper will describe in the following section a technically developed solution of integrating the data quality management process between the Entities used by MDG and the standard relational database technology.

4. Feature add-on for SAP-MDG on data quality

During the analysis of the governance process and that by SAP provided software tools, there were found some aspects, which can suffer optimizations. Focusing on the scope of continuously improving data quality for enterprise data we want to develop a software solution for handling the data represented in MDG by the described entity types.

For the purpose of integrating the final product into the SAP-systems, the application, which is still in the developing process, will be implemented using ABAP (Advanced Business Application Programming) as a programming language.

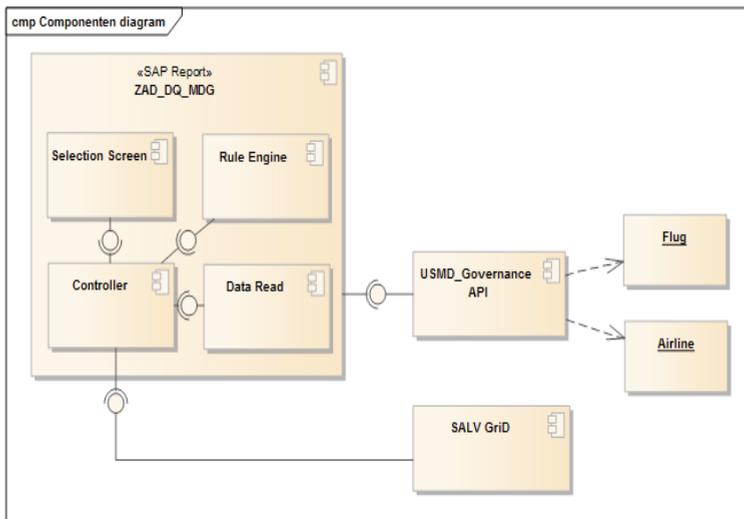
The report should be integrated after the implementation and test phase into productive systems of SAP. Keeping in mind that the report should represent a possibility of linking the governance process – respective the Validation and Data Quality sub-process – with the standard relational database technology it should be given the reason why the final product will be useful.

The main reason is that the report brings the ability of periodically validating data from MDG while writing customized business rules with the scope of reevaluating the data quality degree. Moreover, the report should give the

possibility of analyzing data depending of the entity name we want to be taken into consideration and by data rules the user provides.

As a result of the whole validation and analysis process, an ALV (ABAP List Viewer) containing visual results of the validation should be dynamically build (depending on the chosen and analyzed entity) displayed. Moreover, a batch job should be finally scheduled. A batch job in SAP is a scheduled background process that usually runs on a regular basis without any user intervention. In this manner, the data validation process could be automatized, meaning the whole process will be improved in terms of efficiency.

Figure 4. Component diagram of the report



Like shown in the previous figure (Figure 4) the report has several components. First of all, the key component of the whole report is the “USMD_Governance_API” which enables the interaction between Data Models and their Entities and the classical ABAP processing methods.

First of all, the Data Model is to be read. Afterwards, depending on the model the user wants to take a validation on, the report should provide the possibility of choosing the entity for which the data is to be tested. The described functionality is being provided by the Selection Screen Component.

Secondly, as we were able to read the data through the methods provided by the GOV-interface, the data should be locally being saved in local data tables in order to easily being handled with.

The Data Read Component is the main component of the whole report, as it encapsulates the read function and the further processing. The Rules that

are being processed over the collected data are provided by the Rules Engine Component.

The Controller Component binds mainly all the components, by instantiating objects, which provide the needed functionalities encapsulated in the programmed methods.

The results are displayed due to the help of the ALV Grid Component. Beside the structure of each entity, which is being analyzed, the ALV also displays a suggestive icon with the status of the validation. For a better visualization of the result, the status-icon is being represented by a small ‘traffic light’. Depending on the color (red-yellow-green) the user can easily interpret the results as shown in Figure 5.

All in all, the whole process will be automatized due to enhancing the report with a SAP batch job. That’s how the user gets access in both customizing his needs regarding the frequency of data validation and the process of assuring data quality by applying own defined business rules on the selected data.

Figure 5. Application screenshot

ST...	ID	Fluggesellschaft	Währ	URL der Fluggesellschaft
OK	AB	Air-Heroes of the Un	USD	http://www.airheroes.com
OK	AB	Air Berlin	CHF	http://www.airberlin.de
OK	AM	Meine Erste Airline	EUR	http://www.meineairline.com
Warning	B...	Berlin Air Chaos	EUR	http://chaos@brd.de
OK	CC	Airline	EUR	http://www.xxx.de
Warning	DD	Dagobert Duck Airlin	USD	http://www.dagobert-duck.com/airline
OK	DL	Delta Airlines	USD	http://www.delta-air.com
OK	G...	German Wings	EUR	http://www.german-wings.com
Warning	H...	Airline Hugo	EUR	http://www.hugo
Warning	JL	Japan Airlines	JPY	http://www.jal.co.jp
OK	LH	Lufthansa	EUR	http://www.lufthansa.de
OK	LH	Lufthansa	EUR	http://www.lufthansa.com
OK	MA	Marks Flying Heroes	EUR	http://www.mark-deppe.de
OK	MA	Marks Airline	EUR	http://www.mark-deppe.de
OK	M...	MDG API Airline	ZAR	http://www.mdg-api.com
OK	RB	Red Bull Airline	CHF	http://www.bla.com
OK	YZ	Fantasy Flight Airli	USD	http://www.fantasyflight.com

5. Conclusion and future perspectives

This paper had the focus on describing data quality, giving several reasons on why this research area is a hot topic nowadays, give a brief literature review on data quality, present software tools for the process of data management and finally to suggest an improvement of the data validation and quality assuring process via a new software solution.

Future processes on data management will bring new challenges on this topic, that’s why the research in this field will become a trend in the next few years. Living through the digitalization means for the academics part, as well as for the business part, playing an active role.

Regarding the developed software prototype, this will be enhanced step by step until its functionalities will correspond the existing level of demands on the business side with the focus of being integrated as part of active SAP-software.

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FROM RESILIENCE TO HYBRIDIZATION OF DEVELOPMENT – REFLECTIONS ON THE CENTRAL EUROPEAN REGIONS (CER)

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Abstract: *Linking businesses with new technologies leads to unbalanced growth due to the different types and usefulness of location advantages. Building, in such conditions, the ability to territorial resilience, is striving to achieve functional diversity, creating solutions that have flexibility in relation to changing needs. The increase in density of functions can be likened to hybrid or patchwork transformations in space. The attempts to develop such issues in the context of resilience were divided into the following problems: (I) What is the hybridization of development as a result of building resilience of regions? (II) How are economic development processes evolving, creating a hybrid character of change? (III) How does the hybridization, as an effect of regional resilience capacity building, manifest itself in the CER? Thus the main aim of the paper focuses on defining the concept of hybridization in the context of resilience capacity building in the CER.*

Key words: *resilience; development hybridization; Central European regions*

JEL Classification: *R1; R12*

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1. Introduction

The article provides an introduction to the reflection on contemporary economic development processes generated in spatial dimension, including the regions of Central Europe. Even a cursory overview of the contemporary development regions, including accompanying effects - in the form of new industries, products, services, institutions, competences - indicates a significant diversification of the dynamics of development.

Attainment of dynamic growth is determined by the creation of new, or reintegration of existing, global production chains. The efficiency of this process depends on the ability: to combine existing activities with new technologies, to develop new elements of value chains, to search for places that provide high added value, to adapt products to current market trends and social changes, to acquire new trade areas.

Connecting existing activities with new technologies, their adaptation to current market trends and social changes, lead to unbalanced growth dynamics due to the distinct types and utility of locational benefits. In the case of regions, it means the parallel existence of the stages of growth and stagnation resulting in multiple trajectories of change. Building the ability to resilience of the local community, businesses, territories in such conditions, strive to obtain functional diversity, create solutions which are modifiable and show flexibility in relation to changing needs. As a consequence, the increase in density of functions can be likened to hybrid or patchwork transformations taking place in space. Hybridization is moving beyond the stereotype, sometimes leading to breakthrough solutions. It is a multi-dimensional process developing in many things, which is an alternative to the polarized development paradigm, but also for the homogeneous, or sustainable development. It is a “third space” where elements of various systems meet and fall within mutual transformations.

An attempt to develop such formulated matters may be directed to the following research problem: how do the processes of economy in regions of Central Europe (CER – Central European regions) proceed creating hybrid nature of changes demonstrated, inter alia, in highly heterogeneous dynamics of economic development, i.e. unmatched by demographic scale and the existing socio-economic status of urban and regional centers? Therefore, the main objective of the presented study is the attempt to capture the effects of hybrid economic development across regions of Central Europe in the context of their resilience.

The answer to a research problem was divided into three essential parts. In the first part, was outlined the initial concept of development hybridization as a result of building economic regions resilience. The second shows the

appearance of elements related to the hybridization of development in the territorial dimension. The third part relates to the initial, empirical verification of the assumptions of the hybridization concept in the context of the resilience of Central Europe regions.

2. Hybridization of development as a result of building resilience capacities

The concept of the resilience is now becoming increasingly used for rapid diagnosis, assessment and programming of development of the cities and regions. The origins of the use of resilience in economic terms date back to the concept of sustainable development, which has linked resilience with climate changes and external shocks (Simme and Martin, 2009, p.5). Generally, the resilience combines two essential elements: adaptive capacity determined by, *inter alia*, ability to learn, entrepreneurship, innovation, self-organization (Hudson, 2010, p.14) and the sensitivity of the system to external shocks (interference) such as sectoral crises, global financial crises, energy crises (Bosher and Coaffee, 2008, p.146).

In terms of adaptability, the concept of resilience including economic resilience, can lead to two main strands of study. First one, refers to the identification of attributes which enable to measure the resilience for diagnostic evaluation researches (descriptive and explanatory approach). The second current of research focuses on planning and implementation of operations to improve resilience in the context of the preparation of urban, regional systems to external distortion, shocks affecting the current path of development (normative approach). Both strands of research constitute a consequence of the approach of post-positivist epistemology (Walker *et al.*, 2006, p.17) and together use a systematic approach for understanding of the subject, *i.e.* cities (or regions) seen as a comprehensive, multidimensional open systems. In this way, cities, regions are identified as complex socio-economic systems which are subjected to self-organization, with a few critical processes which create and maintain this kind of self-organization (Hooling, 2001, p.401).

The definitions of resilience, whether it is urban or regional, considered in economic convention often emphasize different aspects of the concept. One of the definition sees resilience as a response of the system to the specific, exceptional events (Simme and Martin, 2009, p.6). Other stresses the stability of the system toward the external distortion (Welter-Enderlin, 2006, p.37; Lang, 2011, p.19). Definitions of resilience are also focusing on the capacity of the system to avoid and manage natural risks caused by human activity (Bosher and Coafee, 2008, p.145). To sum up, the following approaches can be formulated to define the resilience in regional studies (Bernett, 2001, p.978; Foster, 2007, p.16):

- (a) resilience is the ability to maintain the existing development path of the city/region after external distortion, shock. In this sense we refer to resistance of urban system to the adverse influence of the environment;
- (b) resilience is the ability for quick recover to the previous development path of the city/region after external distortion, shocked. This kind of ability can be considered in terms of recovery;
- (c) resilience is the ability for quick refocus of existing development path in the city/region after shock, distortion and gaining existing or higher growth dynamics. In this case, we can refer to re-combination, i.e. flexible society and economy, which are able to anticipate, prepare and formulate responses to external interference.

Lately at Martin's study (Martin *et al.*, 2016, p.564), we have observed the separation of the "re-combination" approach into two separate divisions of defining the resilience, i.e. on the re-orientation (i.e., reorientation and adaptation in regard of the shock) and renewal (renewal of growth path before the shock).

Most of the studies on the resilience assume that the resilient system (such as city or region) responds to external interference by the general attributes that determine the scale of the disturbance impact and reducing (or not) possible "damages", as well as allow to formulate answers and quick adaptation to the new situation (Wardekker *et al.*, 2010, p.995). These kinds of attributes that build and strengthen the resilience, include such features of the urban/regional system as: *adaptability, diversity, efficiency, redundancy, interdependency* (Godschalk, 2003, p.139; Klein *et al.*, 2003, p.47; Walker and Salt, 2006, pp.40-43; Taşan-Kok, Stead, Lu, 2013, pp.46-47). According to this approach, the resilient region is one that has appropriate combinations of specific attributes which allow to react against external interference. In terms of diagnostic and evaluation, indicated resilience attributes form the basis to identify measures of the resilience (Drobniak, 2014a, pp.49-50; Drobniak, 2014b). For example, in the evaluation of this type, measures of resilience can be identified in the basic regional subsystems of the system such as: socio-cultural, economic-technological, environmental-spatial, institutional-political (Drobniak, 2014a, pp.59-65). In this way, the region resilience can be seen as the ability of regional economic structures to quick creation, production, distribution and sale of products. In this case, a basic standard of resilience can be considered as the value of GDP and investment, as the size of employment in established time horizon, i.e. before the disruption, during the disruption, as well as after the disruption.

In the outlined context of the resilience, especially resilient system of attributes relating to building and strengthening the capacity of the adaptation,

the concept of hybridization development is becoming significantly important. Generally speaking, category of “hybrid” is equated with terms such as: hybridizing of two elements belonging to different entities, a combination of different cultures, or technology. In this interpretation, “hybridization” means interaction, linking, crossbreeding of elements characterized by a high level of diversity (Drobniak, 2017a, pp.23-24; Drobniak, 2017b).

Justification for the introduction of hybrid solutions can be searched in the building of adaptability to raise the resilience. In particular, in pursuing functional diversity, creating solutions that show modifiability and flexibility in relation to the quickly changing needs and technologies. Therefore, hybridization of solutions, in terms of the economy, entail the aim of obtaining a competitive advantage, while further building the capacity for rapid adaptability towards ambient changes, i.e. *improvement of resilience*. Striving for development, the impulse for hybridization of solutions is often in conditions, when a completely new technology – changing the existing paradigm – has not yet been finally developed and rational economically remains to use alternative technology (i.e. implementing progress, but to a lesser extent than breakthrough solutions). The result is that hybridization may also be read in terms of creating solutions that are temporary, transitory which allow, for example, economic operators to survive technological shock or period of the intensity of the competitive struggle, or the search for breakthrough technology.

Hybridization of contemporary processes of socio-economic development can be achieved at least in *three planes*, i.e.: the hybridization at the level of *inputs*, hybridization at the level of *solutions* (of products and services), the hybridization at the level of *effects*.

Hybridization, according to foregoing definition, emphasizes the linking, crossing different elements that in economic processes are identified with the inputs. On the one hand, the diversity of inputs, i.e. the competence of human resources, technological and material solutions, distribution channels and sales techniques, or ways of funding projects, is the condition of hybridization. On the other hand, involves the complexity of the process of creating solutions (Drobniak, 2017a, p.24).

Hybridization, on the level of solution, means creating new products, services, which features have a new, expanded functional nature, however, often embedded in the “old”, the existing structure. Science and technology park doing research in the field of nanotechnology is located in a renovated former industrial object (Duszczuk and Kessenides, 2016, p.79) or a new model of smartphone that uses the previously known operating system can be served as examples.

Effects of hybridization are a consequence of the use of hybrid solutions, i.e. products and services with higher functionality. Combining different elements

expressed in the extended functional nature of the products (functional diversity), their modifiability is conducive to the emergence of multidimensional effects of different scale and in different, non-linear range both in the industry and spatial system (Kickelbick, 2007, pp.202-206). For example, IT solutions of customer support processes carried out by the company in one city are used to support clients often located on other continents. The introduction of hybrid solutions in the field of electric motors for cars, raises the need for adjustments in other sectors of the economy, starting with the industries involved in the supply of energy and infrastructure related to it following legal, accounting and transactional services of the entire process. The popularization of renewable energy solutions and the use of passive materials in construction forces the need to refocus not only on existing way of energy supply, but also to rethink the technical infrastructure needs. The introduction of solutions in field of possibility of providing remote working increases significantly the mobility of human capital, making it a factor in the more “aspatial” (Holton, 2000, pp.142-143).

In general, hybridization of effects, inter alia, in the field of economy, can be considered from industrial and territorial point of view. In the industry system, hybrid products and services generate effects which affect a chain of production, also have often serious consequences within other, so far autonomous sectors of economic industry. For example, the introduction of miniature transmitters using Bluetooth technology (so-called beacon) in connection with a proper applications on Smartphone, leads to another way of presenting the works of art in the museum industry, changes of retail trade model in shopping malls, interactive way to explore the towns in the tourist industry (Różyński, 2015, pp.81-82). Another example is the increasingly common three-dimensional printing technology, which has contributed not only to the development of the 3D printers industry, but it is also used in many other sectors of the economy supplanting the traditional production methods of product models, molds for casting products, whole products or their part. Currently the products developing due to the 3D printers are used in electronics, medicine, construction, or jewelry.

In the territorial system, hybridization refers to the situation where hybrid solutions arising in one location (e.g. city, region) exert effects in different place (e.g. on another continent) so far not related in any way with the place of manufacture of the solution (product, service). The example may be previously mentioned solutions in the field of programming of the customer service process, which *de facto* are used by global businesses of modern sector of business services (like for example: Steria, Capgemini, IBM) around the world, or elements of the software created by Polish IT companies used for animation films of Walt Disney in the United States. Hybrid effects considered in the space are determined by the capacity and speed of entry to existing (or create newly)

and integration of the solution (product, service) in the global production chain. Modern communication technologies are conducive to the speed of creation or integration of the production chain, which “aspatial” by nature advantage selected locations to a lesser extent.

3. Hybrid character of change – heterogeneous dynamics of regions

To what extent has scratched above conceptual image of hybridization development is actual confirmation of the economic processes and then in their territorial dimension? For answer this question let us try to look for in researches dedicated to hybridization development that relate to the territorial dimension.

Research on the “hybrid” and “hybridization” – in territorial terms – are carried out, inter alia, by Golubchikov (2014). At the basis of these categories there are various analysis of urban development of Russian cities. High levels of these types of variations is for Golubchikov the basis for defining the objectives explaining the different dynamics of the development of urban centres based on the interactions between the heritage of the post-socialism and the forces of neo-liberal capitalism. According to Golubchikov, the understanding of the development of urban and regional dimension is following: “mutual embeddedness of the legacies of socialism and the workings of neoliberal capitalism that jointly produce what we define as the hybrid spatialities of transition—‘strange’ geographies that function according to the tune of capital but often conceal their capitalist nature with socialist-era ‘legacies’” (Golubchikov *et al.*, 2014, p.618).

Spatially, hybrid development is a type of uneven development being the result of the influence of forces of neo-liberal capitalism, which in terms of the efficient allocation of capital are only crucial those places in the area that provide a satisfactory return on investment. Hybridization is at the same time, the effect of the post-socialistic heritage, including industrial, which determined the specific accumulation of capital, encompassing, inter alia, the location of the specified kind: social and technical infrastructure, economic activities, human and social capital. In terms of regional and local heritage of post-socialism is seen in Golubchikov’s according to the concept of path-dependence and “lock-in”. It means that the existing specific allocation of capital as a result of the heritage of post-socialism determines the potential paths of the development of the territory, advantaging or limiting the cooperation of the forces of neo-liberal capitalism. In this formula, Golubchikov’s concept of hybridization development is linked to the character of the place more or less conducive to the forces of neo-liberal capitalism, resulting in high diversity of growth dynamics, which not always corresponds to the scale of the analyzed territorial units, i.e. cities and regions.

Significant diversities of the dynamics development of the post-socialistic cities and regions have also contributed to the introduction of hybridization development category by Sýkora and Bouzarovsky. In their recognition, post-socialistic legacy generates multiple dynamics of transformation (Sýkora and Bouzarovsky, 2012, p.51). Multiple dynamics of transformation point out a kind of seriality, i.e.: (a) run from universal economic and political changes in the direction of a varied social change, which in result determines the urban and regional changes; (b) changes form a comprehensive environment of causes and effects that take place in space, (c) in the area of cities and regions-part is still lock-in by the post-socialistic heritage, while the part changes rapidly in the form of changes: the organization of space, infrastructure, housing, business investment (Sýkora and Bouzarovsky, 2012, p.53). Sýkora and Bouzarovsky talk about “hybrid nature of territorial development processes”, which is the result of a recombination of post-socialistic and capitalistic elements in a continuous process of forming socio-economic system, whilst the multiple trajectories of change correspond to institutional, social, spatial changes (Sýkora and Bouzarovsky, 2012, p.55).

The hybrid nature of territorial development processes has both internal (i.e. for a given unit of urban, regional), and external dimensions (i.e. on the spatial units of the group). In the internal term, hybrid nature of development processes is manifested in the form of coexistence in the space of a city, region, stages of growth and stagnation, which is the cause of the integration of production chains into the global economy. This kind of integration is carried out in a highly uneven development, i.e. processes of deindustrialization and re-industrialization may appear collaterally resulting in social polarization due to income and duality of behaviors: individuality – collectivity (Sýkora and Bouzarovsky, 2012, p.55). Hybridization of development becomes in the space of the city, region, a collage of past and future.

In the external term of hybridization of development processes for example, can be highlighted a group of post-socialistic cities, regions fast adapting to new conditions (so-called group: *post-transition* according to Leetmaa *et al.*, 2009, p.441). At the same time, there is a group of territorial units still retaining the old structures. Sýkora and Bouzarovsky focus mainly on the interpretation of the transformation processes of post-socialistic cities and regions in terms of “multiple transformation dynamics” resulting from interfusion of social and spatial factors. According to the researchers, institutional factors loom large in the processes of transformation, subsequently followed (or not) by the spatial and social adjustment. Therefore, hybridization of development in territorial terms means an institutional, socio-economic and spatial reality which is the consequence of elements recombination of the socialistic heritage and the capitalistic forces (Smith and Swan, 1998, pp.29-31; Pavlinek, 2003, p.92).

Studies on territorial recognition of hybridization concept of the development has been also carried out by Smith and Tímár (2010). According to their recognition, hybridization is defined as a highly uneven and remonstrated collection of political-economic and socio-spatial changes, characterized by discontinuous nature (Smith and Tímár, 2010:116). Smith and Tímár as a main determining factor of hybrid development consider the impact of neo-liberal capitalism along with market and globally-oriented business models. In addition, they indicate the importance of the so-called: pressure viz. incentives stimulating the changes of business models. In general, globally-oriented business models are subject to –internationally-technological (digitization: Kurzweil, 2004; Kurzweil, 2005; Kurzweil, 2012; Siworek, 2016), social (Harvey, 2012), economic (Wang *et al.*, 2005; Pieterse, 1994), political, and spatial (Palej, 2010; Pichler-Milanovic, 2008) pressures. Such pressures cause economic instability of local and global production chains. Adaptation in the terms of these kinds of instability forces frequent match and/or re-orientation including re-location or closing of respective links of production, which raises specific socio-spatial effects. Frequent changes in this area cause the emergence of development gaps in the territorial dimension. For example, the phenomenon of poverty and inequality appear not only in the regions seen so far as peripheral, but also in areas of cities and regions with high economic growth. In addition, due to the re-location of the chain links of production of cities and regions seen as peripheral can “unexpectedly” start acting as centers of high growth. Whereas cities and regions that functioned as an export platform, due to the high involvement of foreign direct investment, they can, in a short period of time, weaken the dynamics of growth due to the large “exposure” to external changes of demand on the global market.

Another review on the hybridization of the development in the territorial dimension is presented by Patkar and Keskar (2014). According to them, the category of hybridization development is becoming in recent years often cited concept of explaining a varied, discontinuous and highly diversified tendencies of development not only in the business sector (Patkar and Keskar, 2014, p.8531). Hybridization is perceived as an integral component of modern growth dynamics, with proper typology and influencing the spatial organization of socio-economic systems.

The main reason for it, in the industry and territorial sphere, is considered the need for a rapid transformation of the production in the cosmopolitan, consumable and globalized world (Patkar and Keskar, 2014, p.8531). In the dimension of city manifestation of the hybridization is the decentralization of urban structures leading to fragmentation, discontinuous development pattern. In the space of city as a result of the hybridization of development is formed a kind of a “collage” of various functions and different stages of their development. For example, new

trading or exclusive, closed residential neighborhoods are built in the districts so far crisis, but ideally located, inter alia, in regard of the centre, or a good quality of road infrastructure. The existence of this kind of growth areas at the same time, does not preclude the functioning of an “old” places, often struggling with socio-economic problems.

4. Hybridization of the Central European Regions – introduction to empirical studies

Taking into consideration presented wide range of hybridization development concept, analyzed in the context of the resilience, its empirical verification was limited only to the plane of the effects (cf. paragraph I). The subject of research on the hybridization in the context of economic resilience were 53 regions of NUTS2 level of Central Europe. In the study on hybridization of development of the regions, plane of effects is manifested in: diversity of development effects, i.e. their different scale and different, often non-linear, character. Therefore, introduction to the research on hybridization is oriented on searching for: (a) the level of variations in scale of dynamics of the GDP growth, and (b) dependence of scale and dynamics of the GDP growth and rank of Central Europe regions, understood in the context of possessing or not a large metropolitan area by region. With regard to the hybridization development, in the empirical studies two hypothesis have been assumed. According to the first, CER are characterized by a very high level of variability in both economic scale and growth dynamics where greater economic scale of the region does not determine the high dynamics of the GDP growth. The second hypothesis assumes that the growth of GDP of the CER is not directly dependent on the rank of the region, i.e. both regions with metropolitan centers and the regions deprived of such centers can feature a similar dynamics of GDP growth. To countercheck the above hypothesis has been used the following tasks:

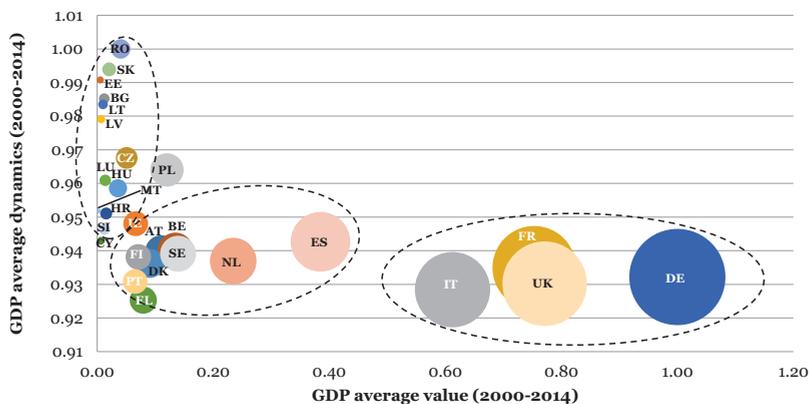
- recognition of broader, i.e. *European context of economic resilience and economy scale of European Union Countries* (n = 28). The task has been performed by using a portfolio method (see Figure 1) on the basis of standardized (up to the maximum) value: the average value of GDP in the years 2000-2014 (X axis), the average growth dynamics of GDP in the years 2000-2014 (Y axis);
- identification of *CER regions with the highest and the lowest GDP growth dynamics* in the years 2000-2014. The task has been carried out with classic indexes of dynamic (Hill *et al.*, 2010, p.9) fixed-basis in regard to value changes of GDP in 53 CER regions of level NUTS2 (Bulgaria, Croatia, Czech Republic, Poland, Romania, Slovakia, Slovenia, Hungary) (see Figure 2 and 3);

- recognition of *relation between economy scale and the dynamics of its growth among CER regions*, i.e. average level of GDP in the CER in the years 2000-2014 and the average growth dynamics of their GDP in the same period. The task has been carried out by portfolio method (see Figure 4) based on standardized (up to the maximum value) for NUTS2 53 regions values: average value of GDP in the years 2000-2014 (X axis), the average growth dynamics of GDP in the years 2000-2014 (Y axis);
- recognition of *the dependencies between the stability of the economy and the scale of the economy changes*, i.e. between the level of variability of GDP growth in the CER in the years 2000-2014, and, so-called force of change of GDP in the same period. The task has been carried out by portfolio method (see Figure 5) based on standardized (up to the maximum value) for NUTS2 53 regions: GDP variation in the years 2000-2014 (X axis) and the coefficient of force of GDP change in the years 2000-2014 (Y axis). There are a few reasons for the introduction to the reflections on the resilience and hybridization development of the CER regions the coefficient of force of GDP change. The first one concerns weaknesses of classic dynamic index with a fixed basis, i.e. the strong dependence of the value of the growth dynamics on the base value. In addition, the classic dynamic index with fixed basis does not take into account the economic scale of the region. The proposed coefficient of force of GDP change expresses both the dynamics of GDP growth, and the economic scale of the region measured by the value of its GDP. Coefficient of force of GDP change formula for the region i is as follows: $FOC_i = \overline{GDP}_i \times \overline{dGDP}_i$, where: FoC_i - force of GDP change of region "i"; \overline{GDP}_i - average value of GDP of region "i" in years 2000-2014; \overline{dGDP}_i - average value of GDP's dynamics of region "i" in years 2000-2014. The values of $\overline{GDP}_i \times \overline{dGDP}_i$ were standardised to maximum values (1.00). Coefficient of force of GDP change expresses the strength of the economic changes of the region understood as its economy scale and its changes, thereby it presents the actual economic impact of the tested region.
- *Organizing the CER regions in terms of resilience*. The task has been done by grouping CER regions according to dimensions: growth dynamics of GDP between 2000-2014 and strength of GDP changes in CER in the years 2000-2014, which ultimately served to build a portfolio: the dynamics of GDP – force of GDP changes. For the grouping purposes for the dimension of the GDP growth dynamics and coefficient of force of GDP change has been used 3-means method (Nowak, 1999, pp.92-94) in relation to the standardized value. The ranges calculated in this way, were

shown in the Figure 6. In all of the aforementioned studies were used regional statistics of Eurostat.

In the broader, i.e. European context of economic resilience, three groups of countries can be distinguished in terms of the economy scale (measured by the size of the GDP) and the growth dynamics of GDP. The first group consists of four countries with the highest GDP (Germany, United Kingdom, France and Italy) and relatively low GDP growth dynamics. However, the scale of their economies is almost 2/3 of the economic scale of the EU as a whole (64.4% of EU GDP). In the case of the second group of countries, their economic scale, as well as the GDP growth dynamics, can be described as average. This group consists of: Spain, Netherlands, Sweden, Belgium, Austria, Finland, Denmark, Portugal, Greece, and Ireland. The last group of countries includes countries that have a very small economic scale, while most of them are characterized by very high growth dynamics of GDP. Among them, there are eight countries in Central Europe, where the regions are subjected to further analysis. These countries are: Bulgaria, Croatia, Czech Republic, Poland, Romania, Slovakia, Slovenia, Hungary. The total GDP of the Central Europe countries is only 6.6% of GDP of whole the European Union (see Figure 1).

Figure 1. Portfolio no. 1: scale and dynamics of GDP in the EU countries (2000-2014) – standardized values

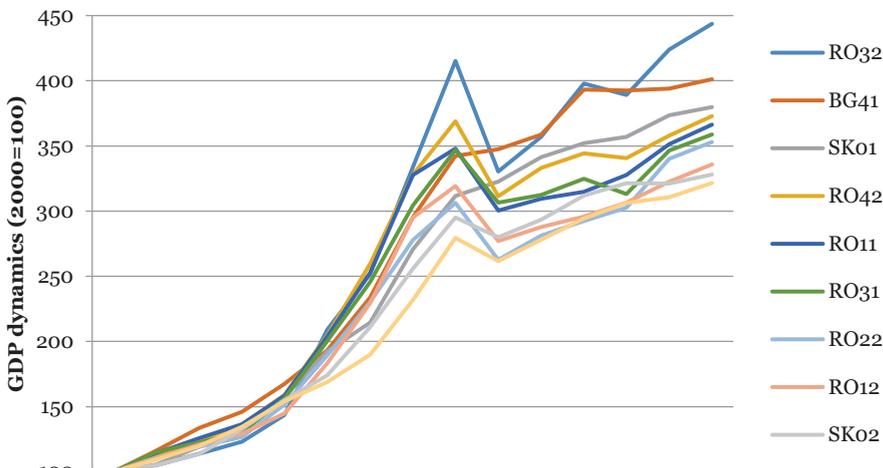


Source: own calculation on the basis of EUROSTAT (updated from: Drobniak, 2017b).

Shortcuts explanations: (AT) Austria, (BE) Belgium, (BG) Bulgaria, (CY) Cyprus, (CZ) Czech Republic, (DE) Germany, (DK) Denmark, (EE) Estonia, (EL) Greece, (ES) Spain, (FI) Finland, (FR) France, (HR) Croatia, (HU) Hungary, (IE) Ireland, (IT) Italy, (LT) Latvia, (LU) Luxemburg, (LV) Lithuania, (MT) Malta, (NL) Netherlands, (PL) Poland, (PT) Portugal, (RO) Romania, (SE) Sweden, (SI) Slovenia, (SK) Slovakia, (UK) United Kingdom.

Within the Central European countries, *10 regions with the highest growth dynamics of GDP* in the years 2000-2014 can be distinguished, i.e. in the range of 322 to 444 assuming 2000 = 100 (see Figure 2). In this group there are mainly, Romanian regions (RO32: Bucuresti – Ilfov, RO11: Nord-Vest, RO12: Centru, RO22: Nord-Est, RO31: Sud - Muntenia, RO42: Vest), as well as Slovakian (SK01: Bratislavský kraj, SK02: Západné Slovensko, SK04: Východné Slovensko) and one Bulgarian region, i.e. BG41: Yugozaapaden. The path of GDP growth in nearly all of these regions (the exception is the SK01: Bratislavský kraj) collapsed in the year 2009 as a result of the impact of the global financial crisis. However, during the period of 3-4 years, all of these regions have recovered to the previous level of GDP growth dynamics - no “remanence” effect has been reported (Martin, 2012, p.8).

Figure 2. Dynamics of GDP in 10 Central European regions (NUTS2) with the best performance in year 2000-2014 (2000=100)

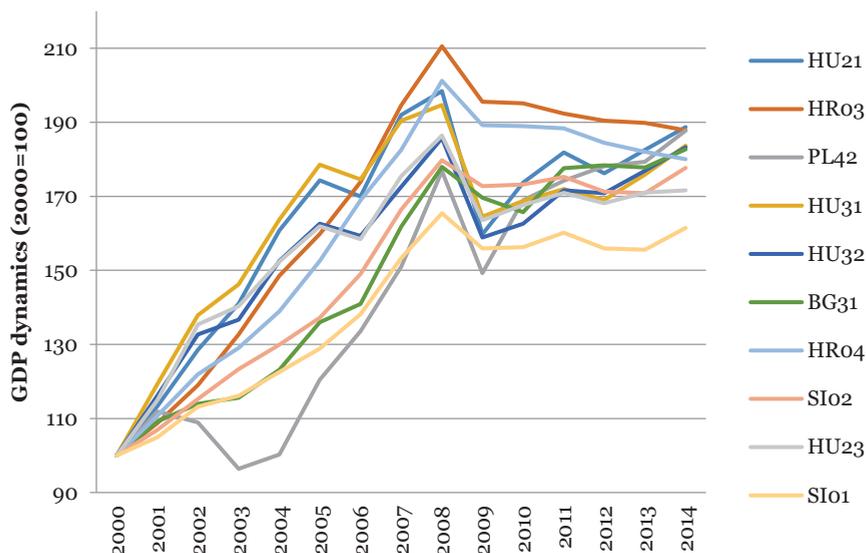


Source: own calculation on the basis of EUROSTAT (updated from: Drobnik, 2017c, p.246).
Shortcuts explanations: (BG41) Yugozaapaden, (RO32) Bucuresti – Ilfov, (RO11) Nord-Vest, (RO12) Centru, (RO22) Nord-Est, (RO31) Sud - Muntenia, (RO42) Vest, (SK01) Bratislavský kraj, (SK02) Západné Slovensko, (SK04) Východné Slovensko

Within the Central European countries, *10 regions with the lowest growth dynamics of GDP* (see Figure 3) can be distinguished up from 161 to 188 assuming 2000 = 100. Among them, there are mainly Hungarian (HU21: Közép-Dunántúl, HU23: Dél-Dunántúl, HU31: Észak-Magyarország, HU32: Észak-Alföld), Croatian (HRO3: Jadranska Hrvatska, HRO4: Kontinentalna Hrvatska), Slovenian (SIO1: Vzhodna Slovenija, SIO2: Zahodna Slovenija) and one Polish region, i.e. PL42: Zachodniopomorskie. With the exception of the latter region,

the rest of them from 2000-2008 year recorded significant growth of GDP. However, after a period of global financial crisis, none of them regained the GDP growth dynamics from 2008 year. Appearance of “remanence” effect is evident (Martin, 2012, p.8).

Figure 3. Dynamics of GDP in 10 Central European regions (NUTS2) with the poorest performance in year 2000-2014 (2000=100)

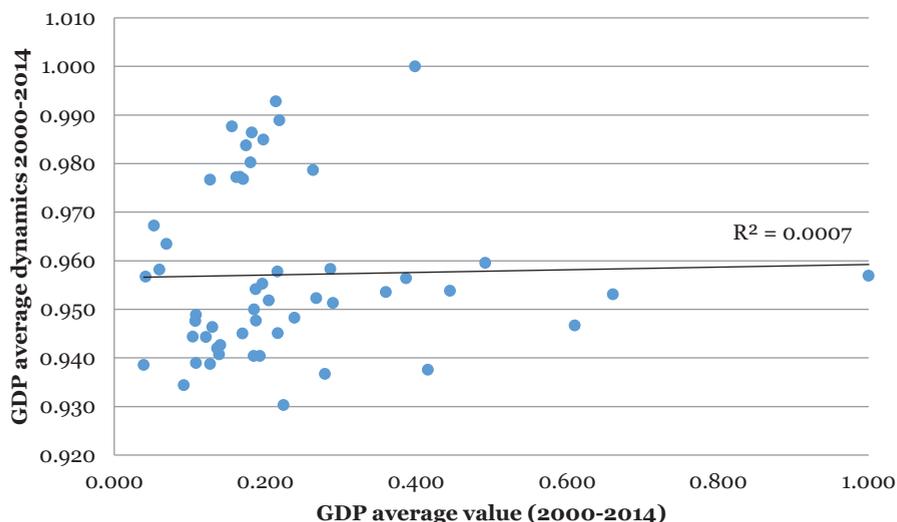


Source: own calculation on the basis of EUROSTAT (updated from: Drobniak, 2017c, p.246). Shortcuts explanations: (BG31) Severozapaden, (HR03) Jadranska Hrvatska, (HR04) Kontinentalna Hrvatska, (HU21) Közép-Dunántúl, (HU23) Dél-Dunántúl, (HU31) Észak-Magyarország, (HU32) Észak-Alföld, (PL42) Zachodniopomorskie), (SI01) Vzhodna Slovenija, (SI02) Zahodna Slovenija.

The analysis of *relationship between economy scale and the dynamics of its growth* provides interesting information about the high level of various economic position of surveyed regions (see Figure 4). CER are characterized by diverse groups identified in terms of the average value of GDP in the years 2000-2014 and growth dynamics of GDP in the same period. For example, economically large regions with strong metropolitan centers (such as: PL12: Mazowieckie – Warszawa, HU10: Közép-Magyarország – Budapest, PL22: Śląskie – Aglomeracja SILESIA) at the same time, characterize the average growth dynamics. Similarly, the average growth dynamics of GDP show regions with medium economy scale although with relatively strong metropolitan centers (CZO1: Praha, PL41: Wielkopolskie – Poznań, PL21:

Małopolskie – Kraków, PL51: Wielkopolskie: Poznań). But regions with the same, i.e. the average economic scale, may show a very high growth dynamics (RO32: Bucuresti – Ilfov). An interesting group constitute regions with lower than average economic scale with different rank of urban centers, but with very high growth dynamics (for example: BG41: Yugozapaden - Sofia; SK01: Bratislavský kraj – Bratislava; RO11: Nord-Vest – Cluj-Napoka; RO31: Sud - Muntenia - Călărași; SK02: Západné Slovensko –Nitra). Similar economic scale of CER regions also exhibit very poor growth dynamics (for example: BG31: Severozapaden – Pleven; HU23: Dél-Dunántúl –Pécs; HU33: Dél-Alföld – Kecskemet).

Figure 4. Portfolio no. 2: scale and dynamics of GDP in the CER NUTS2 level (2000-2014) – standardized values



Source: own calculation on the basis of EUROSTAT (updated from: Drobnik, 2017b).

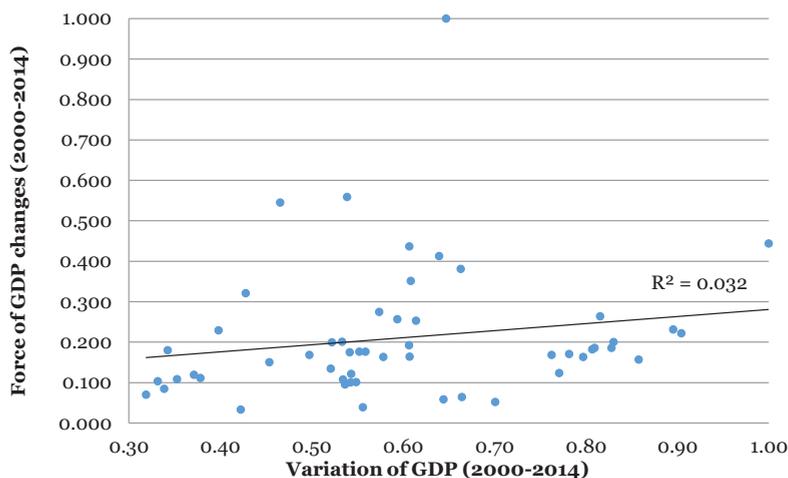
Shortcuts explanations: (BG31) Severozapaden, (BG41) Yugozapaden, (CZ01) Praha, (HU10) Közép-Magyarország, (HU23) Dél-Dunántúl, (HU31) Észak-Magyarország, (HU33) Dél-Alföld, (PL12) Mazowieckie, (PL21) Małopolskie, (PL22) Slaskie, (PL41) Wielkopolskie, (PL51) Dolnośląskie, (RO11) Nord-Vest, (RO12) Centru, (RO21) Nord-Est, (RO22) Sud-Est, (RO31) Sud - Muntenia, (RO32) Bucuresti – Ilfov, (RO41) Sud-Vest Oltenia, (RO42) Vest, (SI01) Vzhodna Slovenija, (SI02) Zahodna Slovenija, (SK01) Bratislavský kraj, (SK02) Západné Slovensko, (SK03) Stredné Slovensko, (SK04) Východné Slovensko.

The analysis of the relationship between *stability of economy and scale of economy changes*, i.e. between the level of variability of GDP growth in CER in

the years of 2000-2014 (variance of GDP) and so-called coefficient of force of GDP change in the same period also confirm significant economic diversity of CER.

Force of economic changes is the highest in Mazowiecki region (PL12), whereas the highest changeability of GDP in the years 2000-2014 occurred in the region: Bucuresti – Ilfov (RO32).

Figure 5. Portfolio no 3: the changeability and the force of GDP changes in the CER regions (2000-2014) – standardized values



Source: own calculation on the basis of Eurostat.

Shortcuts explanations: (BG31) Severozapaden, (BG32) Severen tsentralen, (BG41) Yugozapaden, (CZ01) Praha, (CZ05) Severovýchod, (HU10) Közép-Magyarország, (HU23) Dél-Dunántúl, (HU31) Észak-Magyarország, (HU32) Észak-Alföld, (HU33) Dél-Alföld, (PL12) Mazowieckie, (PL21) Małopolskie, (PL22) Śląskie, (PL34) Podlaskie, (PL41) Wielkopolskie, (PL42) Zachodniopomorskie, (PL51) Dolnośląskie, (PL52) Opolskie, (PL61) Kujawsko-pomorskie, (RO11) Nord-Vest, (RO12) Centru, (RO21) Nord-Est, (RO22) Sud-Est, (RO31) Sud - Muntenia, (RO32) Bucuresti – Ilfov, (RO41) Sud-Vest Oltenia, (SI01) Vzhodna Slovenija, (SK01) Bratislavský kraj, (SK02) Západné Slovensko, (SK03) Stredné Slovensko, (SK04) Východné Slovensko.

Apart from the regions situated in extreme positions from the viewpoint of the force of economic changes and their variation, there are many other groups of CER. Group of very high volatility of GDP, but with a small scale of economic impact, i.e. low values of the coefficient of force of GDP change consists mainly of the Romanian regions (RO11: Nord-Vest, RO12: Centru, RO21: Nord-Est, RO22: Sud-Est, RO31: Sud – Muntenia, RO41: Sud-Vest Oltenia) and Slovak (SK01: Bratislavský kraj, SK02: Západné Slovensko, SK03: Stredné Slovensko, SK04: Východné Slovensko).

Figure 6. Portfolio no. 4: GDP dynamics – force of GDP change

FORCE OF GDP CHANGE (2000-2014)	Very high (0.37-1.00)	PL22	HU10, PL12, PL41, PL51	CZ01	BG41, RO32, SK01
	High (0.22-0.36)	HR04	CZ06, PL11, PL21, PL63	RO21, SK02, SK03, SK04	RO11, RO12, RO22, RO31, RO42
	Medium (0.11-0.19)	CZ04, HR03, PL42, PL61	CZ02, CZ03, CZ05, CZ07, CZ08, PL31, PL32	RO41	
	Low (0.03-0.10)	BG31, HU21, HU22, HU23, HU31, HU32, HU33, PL33, PL52, PL62, SI01, SI02	BG32, BG34, PL34, PL43	BG33, BG42	
		Low (0.36-0.46)	Medium (0.47-0.55)	High (0.56-0.75)	Very high (0.76-1.00)

AVERAGE DYNAMICS OF GDP (2000-2014)

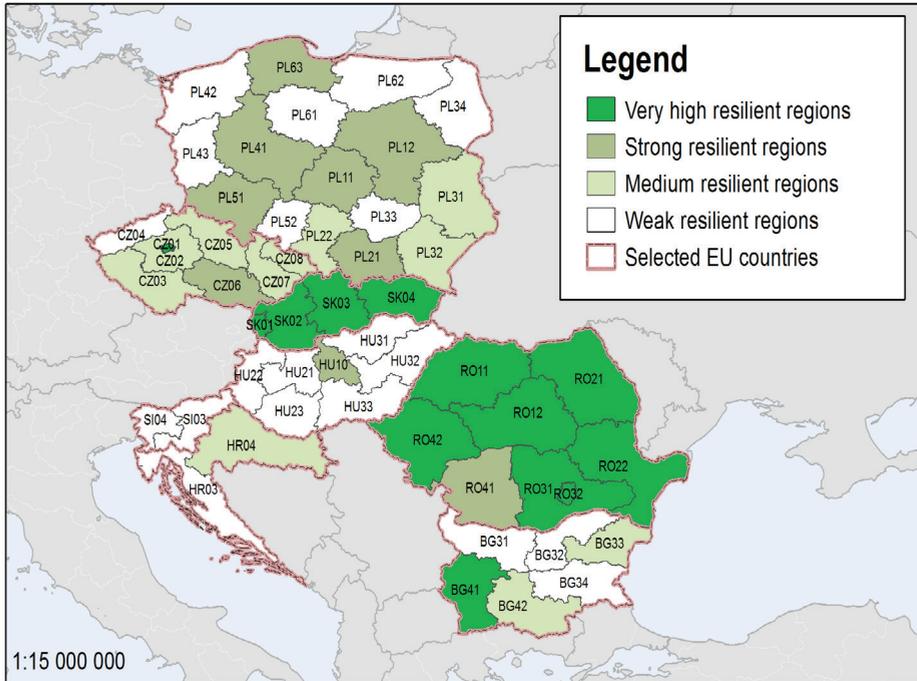
Source: own elaboration.

Shortcuts explanations: (BG31) Severozapaden, (BG32) Severen tsentralen, (BG33) Severoiztochen, (BG34) Yugoiztochen, (BG41) Yugozapaden, (BG42), Yuzhen tsentralen, (CZ01) Praha, (CZ02) Strední Cechy, (CZ03) Jihozápad, (CZ04) Severozápad, (CZ05) Severovýchod, (CZ06) Jihovýchod, (CZ07) Strední Morava, (CZ08) Moravskoslezsko, (HR01) Jadranska Hrvatska, (HR02) Kontinentalna Hrvatska, (HU10) Közép-Magyarország, (HU21) Közép-Dunántúl, (HU22) Nyugat-Dunántúl, (HU23) Dél-Dunántúl, (HU31) Észak-Magyarország, (HU32) Észak-Alföld, (HU33) Dél-Alföld, (PL11) Łódzkie, (PL12) Mazowieckie, (PL21) Małopolskie, (PL22) Śląskie, (PL31) Lubelskie, (PL32) Podkarpackie, (PL33) Świętokrzyskie, (PL34) Podlskie, (PL41) Wielkopolskie, (PL42) Zachodniopomorskie, (PL43) Lubuskie, (PL51) Dolnośląskie, (PL52) Opolskie, (PL61) Kujawsko-Pomorskie, (PL62) Warmińsko-Mazurskie, (PL63) Pomorskie, (RO11) Nord-Vest, (RO12) Centru, (RO21) Nord-Est, (RO22) Sud-Est, (RO31) Sud - Muntenia, (RO32) Bucuresti – Ilfov, (RO41) Sud-Vest Oltenia, (RO42) Vest, (SI01) Vzhodna Slovenija, (SI02) Zahodna Slovenija, (SK01) Bratislavský kraj, (SK02) Západné Slovensko, (SK03) Stredné Slovensko, (SK04) Východné Slovensko.

A group with average volatility of GDP and the average strength of economic changes consist mainly of Polish regions (PL21: Małopolskie, PL22: Śląskie, PL41: Wielkopolskie, PL51: Dolnośląskie), one Czech (CZ01: Praha) and Hungarian (HU10: Közép-Magyarország). Economically the weakest group of CER regions, i.e. with a low variability of GDP and a small force of economic changes, create mainly Hungarian regions (HU23: Dél-Dunántúl, HU31: Észak-Magyarország,

HU32: Észak-Alföld, HU33: Dél-Alföld), also the Slovenian (SI01: Vzhodna Slovenija) and Bulgarian regions (BG31: Severozapaden).

Figure 7. Economic resilience of the Central European Regions in terms of GDP dynamics and force of GDP change



Source: own elaboration.

Shortcuts explanations: as on the Figure 6.

Ultimate organizing of the CER regions carried out according to dimensions: growth dynamics of GDP and GDP force of change allows to highlight 4 groups of areas with a very high level of diversification of economic development processes and resilience (see Figure 6 and Figure 7). *The first group*, most advantageous from the viewpoint of economic forces and resilience covers regions with high or very high GDP growth dynamics and force of changes in GDP. What is essential, in this group among the regions with a strong metropolitan position (CZ01: with Praha, RO32 with Bucharest, SK01 with Bratislava, BG41 with Sofia) there are also areas, which rank of the capitals is definitely smaller (for example: RO21 with Bacău, Botoșani, Iași, Piatra Neamț, Suceava, or SK04 with Košice, Prešov). *The second group* includes regions which characterize high or very high force of changes with the average GDP growth dynamics, as well as high or very high

growth dynamics of GDP, but with the average force of changes. In this group, just like in the first one, there were regions with major metropolitan centers (PL12 with Warsaw and Budapest HU10). But this group also includes the regions with central cities of lower rank in relation to the capitals (for example: SK02 with Trnava, Trencin, Nitra; PL21 with Cracow, PL41 with Poznań, PL51 with Wrocław, or CZ06 with Brno).

The third group of the CER regions compose a mosaic of areas that have a high or very high force of GDP changes with low dynamics of GDP (for example, PL22: Śląskie) or low force of GDP changes with high or very high dynamics of GDP (BG33: Severoiztochen, BG42: Yuzhen tsentralen). In this group there are also regions with average force of changes of GDP and average growth dynamics of GDP (for example: CZ02: Strední Cechy, CZ03: Jihozápad, PL31: Lubelskie, PL32: Podkarpackie).

The last group of the CER regions has an average or low dynamic of GDP changes and average or low force of changes. These are regions with a small economy scale and low growth dynamics of GDP. This group create mostly Hungarian, Croatian, also part of Polish and Bulgarian regions.

5. Discussion and conclusions

The wider, i.e. European economic context, indicates that the countries of Central Europe, just like their regions, distinguish generally high growth dynamics of GDP in the relation to, so-called “old” members of the European Union. It may be due to the high potential of their resilience measured by GDP growth dynamics. However, keep in mind that the scale of economy of the Central European countries measured by the value of GDP represents only 6.6% of GDP throughout the European Union. The question therefore arises: whether the relatively small increase in GDP of the biggest EU economies, i.e. Germany, the United Kingdom, France and Italy (66.4% of EU GDP) in import-export relation do not generate such large increases in GDP in small economies of Central Europe? And whether generated in this way, high growth dynamics of Central Europe countries at the same time guarantees a high level of their resilience? If the high increases in GDP in Central European countries result from the creation of import-export relations with the countries of the “old” EU, it is indicative of building adaptability skills and entering into international and global value chains.

Results of the research on the CER clearly show that both growth dynamics of their GDP, level of their GDP, as well as force of the changes (the product of the growth dynamics of GDP and value of GDP) have a significant level of diversification both to the economic scale of the region, and growth dynamics - higher economic scale of the region does not condition higher growth dynamics.

In this way, the first hypothesis has been confirmed. For example, the fastest-growing regions of Central Europe (e.g. RO32: Bucuresti-Ilfov, BG41: Yugozapaden) in the years 2000-2014 have increased the value of GDP more than 3 or 4 times, while in the slowest developing regions, value of GDP have not even increased twice (e.g. BG31: Severozapaden, PL42: Zachodniopomorskie). In terms of resilience such high increases in the GDP indicates that part of the Central Europe regions did not have any problem with the recovery path of growth from before the global financial crisis. These are of post-transition regions, which economies fit into international value chains and use effectively financial assistance of the European Union. Part of regions where GDP growth was low, probably has a lower adaptability by remaining on the old path-dependence. Observed after 2008 in weaker regions the “remanence” effect enforce the above, showing also the post-socialistic legacy and a negative determinant “lock-in”.

In terms of hybridization of CER development, elements relating to territorial characteristics, i.e. the highly uneven development and multiple transformation dynamics can be found in the presented portfolio analysis. This applies in particular to portfolios: GDP average value – GDP average dynamics and variation of GDP – GDP force of change. In the case of both portfolios potential regression functions are chosen at the level of coefficient of determination $R = 0.0007-0,0320,2$ which means practically the lack of relationship between examined variables reflecting the scale and dynamics of the economic changes in CER. This illustrates the hybrid nature of the economic change as a result of various combinations of the specificity of the space, the forces of neo-liberal capitalism and public intervention in the form of EU support for the regions of Central Europe. By grouping CER regions according to similar values of GDP and the dynamics of change, or variability of GDP and GDP force of changes can determine several strategic groups of CER regions, and regions with strongly polarized positions (i.e. RO32: Bucuresti-Ilfov - the highest dynamics and variability of growth and PL12: Mazowieckie - the highest average GDP and GDP force of changes). Other strategic groups (see Figure 5) are characterized by the low GDP force of changes, however, with very diversified variability of GDP.

Very interesting tool for organizing the CER regions in terms of resilience and the generated effects examined by the prism of hybridization provides portfolio: the average growth dynamics of GDP and GDP force of changes (see Figure 6 and Figure 7). The regions showing the resilience both, in the high growth dynamics of GDP and high GDP force of changes, does not always involve areas with a very strong metropolitan center associated with the capital city of the country (for example, PL22: Śląskie – Katowice, PL21: Małopolska – Kraków, RO21 Nord-Est – Bacău, Botoșani, Iași; SK04: Východné Slovensko-Košice, Prešov). At the same time, regions with a strong metropolitan-capital center do not always

show a high growth dynamics and force of changes (e.g. SIO2 Zahodna Slovenija - Ljubljana). This confirmed the second hypothesis assuming that the growth dynamics of GDP of CER regions is not directly dependent on the rank of the region, i.e. both regions of metropolitan centers and the regions deprived of such centers can have a similar growth dynamics of GDP.

So does hybridization of development mean the randomness of the economic processes, or can it be considered as a new development pattern? Modern development outcomes, including often unexpected links of industries and technologies within the regions, may be read without detailed analysis in terms of randomness. However, more probing recognition of this kind of process, using highly different asset of the inputs, technology, cultures, expose the hybridity.

In general, taking into account the above considerations, we can risk the statement that: currently, building adaptive capacity of regional economies of Central Europe in a globalized and digital world result in new patterns of development, which often take the form of the hybrid. This type of pattern is characterized by: discontinuity, diversity, high level of variety and variability. This kind of economic “pulsing” of regions consisting on “switch on” or “switch off” function in different places of space, depending on the needs of the global integration of production chains. Certainly it is not a single and easy to capture pattern of development.

The hybridization of the development is accompanied by the greater level of uncertainty as to the appearance, maintenance, growth or disappearance of individual industries and their links, including related territories. In consequence of pressure adjustment speed of global production chains escalated by dissemination of information technologies, including digitalization, areas of dynamic growth and sudden regress can appear in both, centers and peripheries. Because hybrid solutions mean more than proportional growth of effects in relation to conventional solutions, they generate multiway, i.e. multi-disciplinary and multi-territorial dynamics changes.

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TERRITORIAL CAPITAL AND REGIONAL DEVELOPMENT: AN ANALYSIS OF TWO HUNGARIAN DISTRICTS

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Abstract: Lake Balaton is the second most popular tourist destination in Hungary, after the capital. This resort area has strong territorial capital, but there are regional differences in economic performance. This study examines the social and economic differences between two small districts (Keszthely and Fonyód) of this recreation area. The research is based on territorial statistical data and a questionnaire survey taken by the respective mayors and local entrepreneurs. The results of data analysis show Keszthely is a more developed and Fonyód is a less developed district in several respects, and the results of the survey reveal the social background of this as there are differences in three measurement dimensions of social capital (relationships, trust, territorial attachment).

Key words: territorial capital; social capital; regional development; Hungary; Lake Balaton

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1. Introduction

In the 21st century regional development is still a popular and researched topic enriched with some new elements. One of them is the importance of the local social and economic conditions, i.e. the special elements of the given geographical locations. It is a complex phenomenon that has acquired a new notion within the context of the economy: territorial capital.

The first occurrences of the concept of territorial capital can be explored in official international and European documents (LEADER, 1999; OECD, 2001; European Commission, 2005) although no exact definitions can be found in them. These documents examine all the assets which somehow can be linked to territorial capital. Thus, they consider territorial capital as a collection of different types of capital in a given place. Researchers had a similar approach to the issue – the research carried out by Roberto Camagni (especially his table of territorial capital components with categories: material and immaterial; public-, private-, and mixed goods (Camagni, 2008, 2009) became the basis. Most researchers believe that the novelty of territorial capital is that the structure and processes of the regional economy can be more easily understood if non-economic assets are measured (Jóna, 2013), and chief among them the immaterial social features. In conclusion, definitions of territorial capital differ little. In respect to quantitative and qualitative tools the following definition forms the basis of our study: territorial capital of a geographical region is a set of material and immaterial, public-, private- or mixed endogenous assets contributing to economic value creation, which are able to form joint combinations, or build up individual structures.

The basis of territorial capital is that it contains several types of assets composed of several factors. Summarizing all the types of assets of territorial capital is a protracted process. Research work usually defines a maximum of four or five, but not from the same perspective. The most common capitals are: social and human capital, connectional-, cognitive-, natural and cultural capital (Tóth, 2013). The elements of capital can be grouped in different ways. The most frequent are the material and immaterial categories. They form part of the value creation process of the economy, or they affect it. The latter case leads to an endless list of assets that can be reduced by selection in time and space, or according to the available information. Unfortunately, capital selection is a more prevalent professional process than linking territories.

Although there is no consensus on concept or model building on territorial capital, a great deal of empirical research on the topic has been carried out. The opportunities to and methodologies for measuring territorial capital are important tasks for researchers. Capital theories and attempts aimed at the operationalization of different types of capitals are intended to make the resources of a given economic

actor measurable and comparable. The value of territorial capital equals the sum of the values of different types of capitals (often the value of joint assets) of a given place. Joining processes, such as factor analysis, facilitates the determination of the value of territorial capital of a given area. It makes regional or temporal comparison possible. Furthermore, the grouping of geographical regions according to similar capital values can be carried out (Tóth, 2013).

Territorial capital research can be carried out in various geographical spaces and at various regional levels. This usually depends on the number of capital types and assets involved. The latter of these is often criticized because of the low number of elements, or the lack of immaterial ones (Jóna, 2013). Choosing multi variable statistical methods may vary, however, it is common to integrate different indicators into a capital type index. Furthermore, giving an exact value for the territorial capital, or the grouping of regions are also popular methodologies. Analysing relations (through the application of regression analysis) between regional growth, development, and the various types of capital and assets are common processes. It is a fact that most studies are based on quantitative research and statistical data using regional analysis methods. Still, to understand immaterial assets well it is necessary to use qualitative elements. Finally, it must be emphasised that there are substantive differences in terms of territorial capital at a local and regional level. Within local factors, it is also very important to measure immaterial elements in order to understand regional economic growth and development.

Because of the aforementioned we analyse two small areas in our study, on the one hand with a quantitative method, and on the other with a qualitative one, focusing on the immaterial social features, thereby enriching our knowledge about local places and society in respect to this issue.

2. The Lake Balaton Resort Area

Lake Balaton is the largest fresh water lake in Central Europe, and it has a varied natural environment (wetlands, dormant volcanoes, basalt columns, a national park etc.). Economic and social changes started at the end of the 19th century with the appearance of tourism that unified in many ways what is otherwise quite a heterogeneous region (administratively, socially and geographically). At the turn of the century, the economy was transformed and unified in many respects, and its gradually developing role in tourism, recognized business interests, and the remarkably rapid process of embourgeoisement created a more or less unified local society in its regional bonding. All of this changed the settlement structure and the use of the landscape (Schleicher, 2010).

The social and political changes following World War II resulted in major changes in the Balaton region. The government of the time recognized the

economic and (almost propaganda-like) role of tourism in the Balaton region and tried to carry out development from the top down. Due to the growth of tourism, the large numbers of people moving to the region as well as land division, holiday home construction and landscape demolition, the first area management regulations and plans appeared as early as the 1950s. By the end of the 1980s the lack of appropriate control of agricultural and industrial plants caused major ecological problems. These were only properly dealt with in the 1990s.

The change in the political system in 1990 in Hungary had serious social, economic and development policy consequences and the Balaton region was not exempt from this. In the beginning of the 1990s there were some adverse environmental factors that affected the water quality, the treatment of which was a long process. At the same time, with the general change in the tourism sector, the role of Lake Balaton also radically changed: each year fewer and fewer visitors came to the lake. Balaton tourism started to decline together with Hungary's general economic recession. The aggregation of all of these problems prompted the recreation of bottom-up organizations that came along with the renewed strengthening of regional identity (Oláh, 2007).

In the 2000s several positive effects began to take hold in the economy of the region. The area became a popular domestic destination again thanks to the various allowance set-ups, and a recovery was perceptible in the traditional branches of agricultural (e.g. viticulture and wine production) as well. In spite of this, the negative economic trends that had started in the 1990s could not be reversed, and this was drastically further impeded by the economic crises of 2008/2009. The effect of the international credit crises severely reduced enthusiasm for local investment and significantly decreased the demand market too.

The regionalization type endeavours can be established as an effective bottom-up process in the society of Lake Balaton from the end of the 19th century onwards. The permanent and holiday population of the settlements around the lake have a measureable Balaton identity and commitment. There is cohesion in many respects in the given society and the regional social capital is strong, which is mainly manifest in self-organization and the considerable level of the civil sector (Kabai, 2014).

Uniformity is visible in an economic respect, which can be best seen in connection with settlements that have a role in tourism, and thus very similar interests. Economic homogeneity, however, is increasingly less present when moving away from the shore of the lake. Nevertheless, according to statistical data, an almost unified territory can be drawn up that shows the presence and high proportion of economic branches that are linked to tourism (Buday-Sántha, 2007). According to social, economic and natural factors, in the interpretation of regional studies, the area around Lake Balaton forms a kind of homogeneous region.

This recreation area is at the focus of Hungarian regional development. Modern regional policy in Hungary was created with statutory regulations in 1996. These unambiguously determined the development areas and the segregation of duties (regions, micro-regions, etc.). Due to its role in the national economy and its nature as well as because of the bottom-up pressure Lake Balaton obtained a special, “emphasized status”, and with this the Lake Balaton Resort Area was created. It was initially comprised of 154 settlements from three counties, but nowadays there are 180 settlements. This constitutes 274,000 inhabitants and 240,000 holiday home owners. Lake Balaton is the second most popular tourist destination in Hungary after the capital: in 2015, one million 544 thousand guests spent four million 989 thousand guest nights in commercial accommodation. In Hungary 15% of guests in hotels and 20% of the guest nights were in this tourism region (KSH, 2016).

This area has strong natural, social, economic, cultural capital (territorial capital), but there are regional differences in economic performance. This can be partly explained by the different classical economic variables, because there are other factors with special contents.

This study examines the economic and social differences between two small districts of this recreation area and the explicative reasons. The research is based on territorial statistical data and a questionnaire survey taken by the respective mayors and local entrepreneurs. The first is used to analyse the well-known economic and social elements of territorial capital, while the second focuses on aspects of social capital (three dimensions: social relationships, trust, and attachment) within the territorial capital system and helps to specify the factors behind the differences.

3. The level of regional development and territorial capital of Fonyód and Keszthely districts according to statistical data

In our study we compare the Fonyód and Keszthely districts of the Lake Balaton Resort Area. The reason for choosing these two districts is that although their geographical distance is short, there are huge differences between them in respect to the level of development: per capita income in Keszthely district is much higher (at 17%, Table 1), and in the rank list of regional development of districts (which is used in Hungarian Regional Policy for the delimitation of less developed areas (Government Regulation 290/2014)) Keszthely is 56th and Fonyód is 94th out of the 198 Hungarian districts. (There are 175 districts in Hungary (and 23 in the capital); this territorial level (which is LAU1 in EU territorial system) was created in 2013 as a new element of state administration (in Hungarian: “járás”). Between 2003 and 2012 this territorial level functioned

at a micro-regional planning level, with a partly different territorial subdivision and name (in Hungarian: “kistérség”).

Of the two districts Keszthely is in the western part and Fonyód is in the southern part of the Lake Balaton Resort Area. The features of their spatial structures are similar: both of them are divided into an urbanized shoreline with a high level of tourism, and a rural background with small villages. One important element of territorial capital is accessibility (OECD 2001), which is good in both of them: the M7 motorway (which starts from the capital, Budapest, and ends in the southern border of Hungary) goes through Fonyód district and is near to the Keszthely district too, so the capital is not far away (150-170 kilometres). In Keszthely district there is a small international airport.

The population of Keszthely district is almost 50 thousand, and in Fonyód district it is close to 35 thousand. There are 30 settlements in the Keszthely district, of which Keszthely (with 20 thousand inhabitants) and Hévíz (with 5,000) are the towns. In the Fonyód district there are 21 settlements, and four of them are towns: Fonyód (5,000), Balatonboglár (5,900), Balatonlelle (5,300) and Lengyeltóti (3,000), but these are small centres, compared to Keszthely. Tourism is important for the economies of both districts, additionally it is the service sector, retail (partly based on tourism) and agriculture that remain the main elements of the local economies.

Table 1. Values of the main social and economic indicators in the two districts (2011, 2014)

	Keszthely	Fonyód
Population (1,000)	49.1	33.9
Per capita income (1,000 HUF)	585.1	500.1
Active population (%)	58.6	59.4
Economically inactive population (% , 2011)	38.5	46.6
Unemployment rate (%)	5.8	9.3
Max. primary school qualification (% , 2011)	19.5	28.4
Taxpayers (%)	44.7	43.7
Number of enterprises per 100 capita	22	25
Annual average income of individual enterprises (million HUF)	2.7	2.1
Annual average income of joint enterprises (million HUF)	1.8	1.5
Number of guest nights per capita	28.5	8.5
Tourist tax per capita (1,000 HUF, 2010)	11.9	8.8

Source: KSH (Central Statistical Office of Hungary).

We can initially compare the social and economic status of the districts based on the classical main statistical indicators (Table 1). The social indicators reflect a better status in the case of Keszthely: although the population is slightly older in this district, the value of the unemployment rate and proportion of economically inactive people in the population are much lower than in Fonyód district. The number of taxpayers and per capita income are higher in Keszthely, with one of the reasons for this situation being the higher educational levels of the inhabitants in this district.

Keszthely also has a better status in regard to economic indicators: although the relative number of enterprises is slightly more in Fonyód district the annual average income of enterprises is nonetheless higher in the other district. A significant difference can be measured in respect to tourism: the value of guest nights per capita is more than free times higher in Keszthely district. The main reason for this is not only the attractiveness of the famous centre (Keszthely), but also that of the other (small) town, Hévíz, which is a very popular thermal spa among both Hungarian and foreign tourists.

As a result of unfavourable values of the main indicators, the Fonyód district has been one of the support areas in the Hungarian regional policy since 2014 (Government Regulation 209/2014.), but it is at the bottom of the list of support areas (the districts from 89th to 198th position in the rank list of regional development are support areas and Fonyód is 94th), which reflects a reasonable situation in the context of Hungary.

Table 2. Some immaterial indicators and their values in the two districts

	Keszthely	Fonyód
Participation in parliamentary elections (% , 2014)	60.1	58.1
Average number of candidates for mayor per settlement (2014)	2.4	2.0
Number of non-profit organizations per 1,000 capita (2014)	15.5	12.4
Members of religious denominations (% , 2011)	72.4	69.6
Suicide rate (number per 100,000 capita, 2014)	19	57
Registered crimes per 1,000 capita (2014)	303	302

Source: KSH (Central Statistical Office of Hungary), TEIR (National Regional Development and Territorial Information System of Hungary), OVB (National Electoral Committee of Hungary).

In respect to the general positioning of the districts we can compare the values of some published immaterial indicators, which are close to the social (and territorial) capital in our view since these represent community activity

(Table 2). (Putnam (2000) was the first to attempt to measure social capital by using indicators of community activity.) The data on participation in parliamentary elections does not show any big differences, but Keszthely district has a better value. We can see the same situation in the case of the average number of candidates for the position of mayor per settlement. The indicators of non-profit activity and religion also show slightly better values in the case of Keszthely. The value of the suicide rate reflects the unfavourable social situation in Fonyód district, but the value of the indicator for crime does not.

4. Social capital of Fonyód and Keszthely district according to a survey

The majority of past territorial capital-related research – both national and international – are based on a quantitative methodology, relying primarily on statistical data. There are only a few exceptions that approach territorial capital from a qualitative point of view. Our research considers these deficiencies, based on a survey, and focuses on aspects of social capital within the territorial capital system. In respect to social capital, measurability is curtailed due to the limited number of available indicators, furthermore, several aspects are measurable only through personal interviews.

Based on the literature (e.g. Grootaert-Bastelaer, 2001; Dudwick *et al.*, 2006; Füzér, 2015), this research defines social capital in a complex way where several measurement dimensions were applied: the relationship between networks and social activity, trust, and territorial identity. In the selected districts, we concentrated on the characteristics of social capital of two social strata, which, according to our assumption, have the greatest impact on competitiveness and thus on territorial capital: local leaders (mayors) and local entrepreneurs. In Fonyód and Keszthely districts we measured the characteristics in a representative sample. In both districts, nearly half of the mayors were reached by our questionnaire (10 and 16, in total 26 mayors) and we reached 50-50 local enterprises (0.60% of the total in Fonyód district and 0.47% in Keszthely district). (Enterprises were measured at a representative rate for sectoral distribution.) We developed two questionnaires for the two groups, but in some parts, these are the same. In both questionnaires we used a combination of those questions that were used earlier in international and Hungarian research on this issue (e.g. Oláh, 2010; EF, 2012; ESS, 2014; Szabó, 2014).

In total, the results show that there are differences in all three measurement dimensions (social relationships, trust and attachment), however, the differences are not significant in some cases.

At first, we analysed *social relationships*. Among the mayors we measured the link density with the civil sphere and enterprises. Although there is not a

big difference between the relative number of civil organizations in the districts (Table 1), in the case of Keszthely the density is higher (almost 60% of mayors have more than five connections with organizations in the latter district, in contrast to the other area, where this value is only 20%). In the case of enterprises, the situation is better, as it is in the case of Keszthely (90% vs. 70%). Therefore, we can assume the organizations and enterprises have closer ties with the mayors in Keszthely district, and that the mayors are more open-minded here.

In the survey we asked about ties with other mayors and settlements. In Fonyód 90% of the mayors have close ties with other mayors in the districts, and 40% of them have more than 10 ties with mayors outside of the district. In Keszthely these values are 100% and 56%. In Fonyód district 50% of the mayors claimed to have partnerships with foreign settlements, in Keszthely it was 56%. This information demonstrates that the situation is slightly better in the case of ties for Keszthely.

Another question was designed to reveal the ties between the mayors and the various politicians (ministers, state secretary, parliamentarian etc.), prominent public figures (scientists, artists etc.). In this issue, however, the Fonyód district has better values: 35 per mayor, vs. 25 in Keszthely district. Megyesi in his study (2015) highlighted that in the Lengyeltóti micro-region (which existed before the Fonyód district in that area, between 2004-2013) the local actors of public life usually wait for help and support from external resources, and the local initiatives are weak; our results substantiate this statement.

The last question in this topic was about the activity of the mayors in the local communities. In respect to membership we did not find a distinct difference (membership in civil organizations: Keszthely - 75% of the mayors, Fonyód - 70% of the mayors, in sporting organizations: Fonyód 50%, Keszthely 38%, in religious institutions: Keszthely 31%, Fonyód 30%), except for membership in a political party (Fonyód: 30%, Keszthely: 13%). However, in the case of the frequency of community participation we were able to measure better values for Keszthely district: 69% of the mayors participate in cultural or community events on a weekly basis, as opposed to Fonyód where this value is only 40%. This information demonstrates that in Keszthely district the mayors have a stronger attachment to the local society.

In the case of entrepreneurs, the most important results are the following. At first, we tried to examine the business relationships of the enterprises. In this issue we were unable to find any distinct difference: in the two districts the enterprises operate (the sales) mainly in the official centres of the districts (Keszthely 51%, Fonyód 52%), and in the district (22%, 15%) and county (21%, 17%). The difference derives from the greater importance of agriculture in Fonyód district, and this also explains greater exports (Fonyód: 10%, Keszthely: 5%). Ties can also be measured through membership in business cooperation:

in Keszthely 12%, in Fonyód 20% of entrepreneurs are members in a minimum of one organization (beyond the mandatory membership in the chamber). The answers to the other question regarding requests for assistance show higher levels of self-confidence and more solid local ties in Keszthely district: 90% of entrepreneurs claimed they can solve their problems on their own and 14% of them hire external expertise; in Fonyód these values are 74% and 56% (more answers could be marked). These results also confirm a high level of dependence on external input in Fonyód district.

There were questions on ties with important public figures and on activities in the local communities, including that of mayors. In Fonyód district an average entrepreneur has 3.5 ties with important persons, in Keszthely this value is five. If we look at the participation in local community life we cannot measure any significant difference in respect to membership, but there is a significant difference in respect to activity: in Keszthely district 20% of entrepreneurs participate in cultural and community events on a weekly basis, compared to 8% in Fonyód district.

By and large, in the case of social relationships (the first factor), and in that of the mayors and entrepreneurs surveyed, we can establish that in the Keszthely district stronger local networks and a higher level of internal coherence was found, while in Fonyód district external institutional relations are more dominant.

Secondly, we analysed *trust*. The main results are the following. The main question was on the general trust in people, and trust in the system of law and policy. There is no distinct difference in the case of the mayors, but slightly better values were measured in Keszthely district (Keszthely vs. Fonyód – general trust: 5.93 vs. 5.3, system of law: 6.53 vs. 6.4, parliament: 6.79 vs. 6.1, politician parties: 4.75 vs. 4.8, politicians: 5.2 vs. 4.8; maximum value could be 10). The general judgement is worse among entrepreneurs, with slightly better values in Keszthely district (Keszthely vs. Fonyód – general trust: 5.84 vs. 5.24, system of law: 4.77 vs. 4.52, parliament: 4.17 vs. 3.96, politician parties: 2.96 vs. 2.48, politicians: 3.09 vs. 2.47), but the differences are not significant in this issue.

Another, more detailed questionnaire was also used in this topic. Szabó (2014) tried to measure trust in the case of 25 institutions and organizations, and we used this form too. In the interpretation of the answers, he made five groups of them (organs of state power, state institutions, the media, market and economic organizations, civil organizations), and we followed this example. If we compare the values of five groups (with a maximum value of 100 points) which was given by the members of two social strata of two districts (this means 10 pairs of values), then we can establish that in eight cases Keszthely district has better values, but the relative significant differences were measured only in the case of the mayors (with a difference of more than five points), and in three cases from these five compared value pairs the difference was only between five and

six points, and only in the case of trust in state institutions (8.1) and civil groups (7.3) was it significant, with better values for Keszthely district.

In total, differences found in the level of trust in political institutions and associations (second factor) would also confirm the supposition that different levels of development result in a more negative experience in the case of Fonyód district.

Finally, we analysed *territorial attachment*. Several research studies have highlighted that in addition to local and county identity, regional identity can be detected in some cases in Hungary (e.g. Palkó, 2011; Pálné, 2009), and one of the most striking examples of this is the Balaton area (Oláh 2010). In our survey all the mayors and entrepreneurs interviewed like living in their district (with one exception). Digging deeper into the issue, 8-8% of the entrepreneurs of the two districts would like emigrate in the future. In regard to the question about the main elements of their territorial attachment, the answers are similar in the two districts in the case of mayors: personal relationships (friends, family, neighbours, tradition) and the environment (natural environment, residential environment, regional environment) are the two most important elements, but in Keszthely district relatives were given much more marks in these categories (20 marks for personal relationships and 22 for the environment from the 10 mayors in Fonyód; 36-36 marks in these two categories from the 16 mayors in Keszthely; one responder could mark more than one). In the case of entrepreneurs, the same picture emerges, but Keszthely has a stronger and more complex identity composition (76 marks for personal relationships, 58 for the environment from the 50 entrepreneurs in Fonyód; 100 and 94 marks in these two categories from the 16 entrepreneurs in Keszthely). (Several responses were available and can be marked; beyond the above: place of work, owned property and business partners were the options).

By and large, the level of territorial attachment (the third factor) was more or less the same in the two districts, however, the assessment of identity-creating elements indicated a slightly weaker attachment in the case of Fonyód district, the explanation for which may be the district's lower social and economic potential.

It is important to emphasize that a possible connection between social capital and territorial development does not exclude considering other factors. Nevertheless, differences measured in social capital can indicate differences in territorial development.

5. Conclusion

In Hungary, the Lake Balaton Resort Area has an individual characteristic, and in several respects it is a special region, and it has therefore been a priority in Hungarian regional policy for a long time. The parts of this area are similar in several aspects, mainly in the case of tourism, the spatial structure and the

strong social traditions. However, there are regional differences in economic performance, and this can be explained by the different material and immaterial factors. In the case of Keszthely and Fonyód districts we presented and analysed these differences, and we pointed out that in the background of the higher development level of Keszthely district there are some important social immaterial elements. The results verify the importance of the social and territorial capital, and emphasise their roles in the regional development inequalities.

The study demonstrates that the complex approach of territorial capital can be a useful tool to explain the reasons for development differences. In addition, the present research confirms that a more thorough and deeper qualitative assessment of social dimensions is also needed when analysing economic performance and competitiveness. In conclusion, in regard to the research it should be emphasised that in order to better understand regional economy processes and structures, featuring immaterial capital elements along with the usually applied material variables in the analysis can lead to more accurate results. Territorial capital, by definition, enables an overall conceptualization and operationalization of all the aforementioned factors.

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AN INTEGRATIVE FRAMEWORK OF RELATIONAL GOVERNANCE MECHANISM BUILDING IN STRATEGIC ALLIANCES

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Abstract: *In this paper, we argue that the social relations at individual level between persons who directly work in strategic alliances represent a key factor for the implementation's success. In this sense, we provide an integrative framework for the Relational Governance Mechanism (RGM) building in strategic alliances. Based on a grounded theory approach, inductively developed in five vertical strategic alliances, we observed that the trust, the reciprocal commitment and the communication attributes are well developed and common in all the cases. But what made the difference between the most successful partnerships (described in terms of satisfaction with the alliance and the accomplishment of alliance's goals) and the medium ones was the integrative conflict management and the win-win approach on a long-term. Specifically, the creation of a dyadic culture toward building a common future.*

Key words: *collaborative strategies; strategic alliances; relational governance mechanism; formal governance mechanism*

JEL Classification: *D21; D22; L14; M12*

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1. Introduction

The top management formulates and sets the legal parameters for strategic alliances but are the day-to-day operations and interactions between people and teams of engineers, sales persons, operational workers that determine the success of implementation and the achievement of the common goals (Nielsen, 2010). Some scholars, for example Kirby and Kaizer (2003), Kauser and Shawn (2004), Taylor (2005) argue that the operational factors are even more important than the formation/structural factors for the collaborative strategy implementation and the accomplishment of the common goals. Others, like Choi and collaborators (2007) argue that 70% of strategic alliances failures are due to a poor management of the partners of the operational phase. To help in coping with this problem our paper argues that the managers have a kind of “secret weapon” which they may utilize in order to increase the probability of successful strategic alliance implementation, called the Relational Governance Mechanism (RGM). Based on social contract theory (Wallenburg and Scaffler, 2014) we propose a view of the RGM as a set of social ties formed between individuals who work in one alliance. The idea of social contracts has a long history and can be dated back to 300 years ago due to social and political upheavals in Europe (Wallenburg and Schaffler, 2014). Moreover, the relational exchange theory in economic sociology also discusses how personal relationships based on trust arise and exist between firms (Dore, 1983 *apud* Kale *et al.*, 2000).

In addition to the critical importance played for the implementation phase, we chose to in-depth and develop the understanding of this topic (the RGM) for the following three reasons. First, there is some empirical evidence in the alliance literature suggesting that through creating and developing the RGM the firms participating in one collaboration had enhanced their innovative capabilities/performance (Bouncken *et al.*, 2016) and firm’s productivity (Bener and Glaister, 2010; Kauser and Shawn, 2004). In this sense, being aware of how the firms can build the RGM becomes an important topic for researchers and for practitioners because it suggests that is a necessary tool for the companies if they want to increase their innovative performance and productivity. Second, the RGM is an effective mechanism that can be used to curb the opportunistic behavior of the partner firm. For example, Kale and collaborators (2000) had found that the firms which had built an effective relational mechanism with their partners had increased the learning achieved from their partners, concomitant to achieving protection for the own resources and core competences. In this sense, the RGM tends to become an important component of the alliance’s overall governance mechanism because help the parent firm to gain access to partner resources and on the same time to protect is self from the possible opportunistic behavior. And

third, the RGM tend to become important for the companies engaged in strategic alliances (and in consequence also for alliance researchers) because helps to align partners long-term vision and interests (Bouncken *et al.*, 2016; Dyer and Singh, 1998). In this sense, we argue that knowing how the firms can build the RGM with their partners becomes an essential topic, even critical, because it seems that the RGM is essential for long-term partnerships' development.

Despite these motivations and the increasing in importance of the RGM the attention devoted to this topic [and in general to the operational phase (Taylor, 2005)] is largely underexplored in the alliance literature. Even if there are many scholars discussing aspects related to the RGM up to now there is no evidence on how to build it. For instance, Kale and collaborators (2000) look at the relational capital from the perspective of mutual trust, respect and friendship at individual level between the persons who work in the alliance. Although they outline the importance of building the relational capital they do not specify how to create it. Bouncken and collaborators (2016) refers to the RGM as reciprocal exchanges which are embedded in social relationships. They also turn the discussion regarding the RGM towards how the level of trust, commitment and the moral norms impact the collaboration's performance. Wallenburg and Scaffler (2014) examine if it is productive to complement the transactional governance mechanism (TGM) with the RGM. A more integrative work pertains to Sarkar and collaborators (2001) which states that the relational capital consists from three components: mutual trust, reciprocal commitment and bilateral information exchange. Although the more complex view, they also treat the RGM in a more simplistic view and do not examine how it should be built. All these researchers outline the importance of building the RGM for good performance and provide some overview level concepts regarding what it is the RGM but do not enter in detail and do not discuss how the managers can build it.

On the other hand, other stream of researchers looks the RGM more broadly and include also some formal non-legal tools as components of the RGM. For instance, Hoetker and Mellewigt (2009) argue that the RGMs refer broadly to mechanisms that enhance the building of trust and social identification – for example establishing teams or committees – bringing more uncertainty regarding what actually is the RGM. Contrary to this stream of researchers that proposes that the RGM refers also to formal non-legal mechanisms/tools our paper proposes that the components of the RGM is not the same with the tools used to build it, “rejecting” this assumption. (See the Figures 1 and 3 for clarifications.) For instance, the mutual trust is a component of the RGM and establishing teams or task forces are tools used to enhance the trust between partner firms but are not components of the RGM. (Establishing teams or task forces are components of the FGM – the formal non-legal one.) Because the

firms can use formal or informal tools to build the RGM, we propose that the researchers and the practitioners should differentiate clearer the governance mechanism from the tools/activities used to build it. In our view, the RGM refers *only* to those aspects pertaining to social relationships like trust, friendship, good-breading, or commitment between people formed at individual level.

As we can see there are several previous contributions to the research in RGM field but up to know there is virtually nothing on the field on how to build it. This is the gap in the alliance literature that our paper tries to cover it. And from here the research question: *How the managers can build the RGM in a more professional way?* In this sense, we integrate previous findings within the alliance literature related to building trust, commitment, and other aspects of social relationships into one framework with the purpose to find how the firms can build the RGM.

The article refines and extend the extant alliance literature in the field of governance mechanisms because it suggests that there should be a more professional way to look the RGM (it is not enough to describe some aspects like trust, or friendship, the RGM does not look in this way, is not about friendship, is about increasing the firm's financial performance, innovativeness etc.) and provides new insights regarding how the firms can build the RGM.

On the empirical part, we will discuss our data through an Interpretative Phenomenon Analysis (IPA) and a Qualitative Comparative Analysis (QCA) in five vertical strategic alliances formed between Romanian companies (headquartered in Cluj-Napoca, Nord-West Region) and their partners and will draw our conclusions based on a grounded theory approach (Chelcea, 2007; Eisenhardt, 1989).

In what it follows, we begin with describing the RGM more in detail. (What "components" does it contains.) Thereafter, we follow with presenting the methodological part of our paper. We then discuss how the managers of the firms in our cases have built the RGM with their partners, realizing also a comparison between cases. We end with presenting paper's implications for theory and practice and discussing paper's limits.

2. Literature review

2.1 Collaborative strategies/strategic alliances context

The collaborative strategies, or strategic alliances, are voluntary agreements between two or more firms which put in together some of their resources and capabilities to accomplish common goals, achieve mutually benefits and obtain competitive advantage (Barnes *et al.*, 2012; Das and Teng, 2000; Gulati, 1998; Hitt *et al.*, 2007; Kale *et al.*, 2000). The collaborative strategies/strategic alliances can be of several types: buyer-seller partnerships, partnerships

between competitors, contracts to outsource the production, various distribution agreements, joint production, joint innovation and so on. All these types are organized and take the form of Strategic Partnerships, Minority Equity Alliances or through setting the Joint Ventures companies (Barnes *et al.*, 2012).

We focus our research in vertical alliances since our research objective is to find how the managers can build the RGM. We tend to believe that in general, the social aspects of strategic alliances are more probably to be well developed in vertical alliances in comparison with horizontal ones. In fact, Rindfleisch (2000) had found that organizational trust (a subcomponent of the overall RGM) is higher in vertical alliances compared to horizontal alliances. The same can be true also for the other components of the RGM. Since the risk of opportunistic behavior is higher in horizontal alliances and the goals are more likely to conflict between the venture partners (Rindfleisch, 2000) we tend to think that all the social aspect are more prone to be well developed in vertical collaborations. Therefore, we focus our research in the vertical ones. Vertical alliances are collaborative strategies between independent firms operating in distinct stages of the value chain of one good/service. (Pitt and Koufopoulos, 2012). This type of alliances is formed for many objectives such as the procurement of the raw materials needed to produce goods/delivery the services, the distribution of the parent firm's products, franchising contracts etc.

2.2 What is the Relational Governance Mechanism?

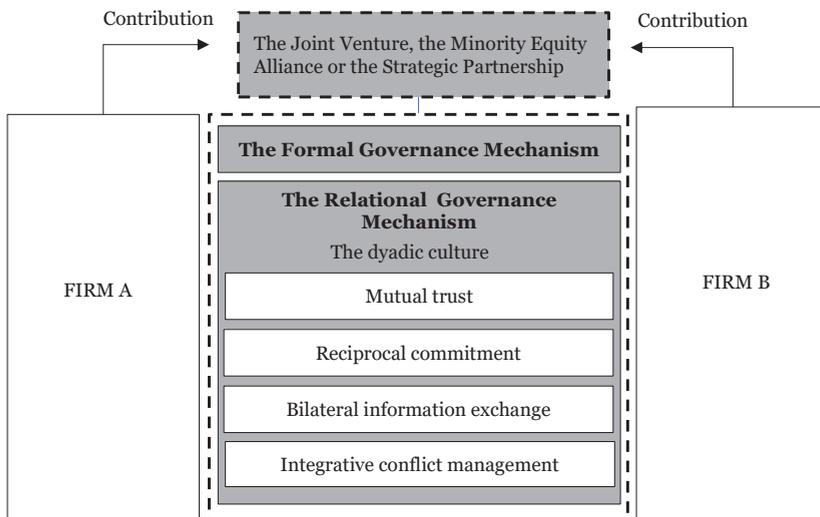
Previous works suggest that two or more firms, partners in one collaboration, may use two distinct types of governance mechanisms for facilitating the accomplishment of the alliance goals and improve firm's innovative and economic performance (Bouncken *et al.*, 2016; Hoetker and Mellewigt, 2009; Krishnan *et al.*, 2015; Wallenburg and Schäffler, 2014). Broadly, the alliance scholars suggest these mechanisms are called formal and relational governance mechanisms.

On the one hand, the partners begin their relationship defining the scope of the alliance and designing the contracts within the negotiation stage. As the negotiation evolve toward a consensus and the future relationship arise, the managers responsible with the collaboration should start designing the formal organization of the future transaction and building a set of social ties between the individuals involved in the alliance. The first one is called the Formal Governance Mechanism (FGM) and centers on formal mechanisms used to manage the relationship between the partner firms (Bouncken *et al.*, 2016; Hoetker and Mellewigt, 2009). The FGM called also transactional governance mechanism in other works (Bouncken *et al.*, 2016; Wallenburg and Scaffler, 2014) or the relational capital (Hitt *et al.*, 2007) involves the legally binding agreements

put in place by the partner firms with the scope to govern and/or manage the relationship. It centers on contracts, including the specification of the rights and the obligations of the partners that need to be defined or enforced. The FGM can specify also the collaborations' goals, the terms, the intellectual properties rights and the procedures for the conflicts resolution (Bouncken *et al.*, 2016). In our work, the FGM refers also to the formal non-legal mechanisms put in place between the partners in order to achieve the implementation's success. For instance, the common strategy.

On the other hand, the Relational Governance Mechanism (RGM) is based on shared norms to monitor and coordinate the behaviors of the exchange partners, aspects complementary and distinct (or even without any legally binding agreement put in place to manage the relationship in the Gentlemen's Agreement collaborations) to the legal or non-legal FGM. Overall, this type of governance mechanism is based on reciprocal exchanges which are embedded in social relationships between persons who work in the alliance (Bouncken *et al.*, 2016; Kale *et al.*, 2000; Wallenburg and Scaffler, 2014). In this case, the relationship between the partner firms is managed through trust, respect, friendship, commitment, social norms, mutual understanding, at the personal level between individuals who work in the alliance, alongside moral control and a cooperative atmosphere (Bouncken *et al.*, 2016; Hoetker and Mellewigt, 2009; Kale *et al.*, 2000).

Figure 1. The Relational Governance Mechanism's components



Source: authors' own elaboration.

In our paper, we synthesize and integrate previous works within the alliance literature and propose an integrative view for the RGM. We argue that the RGM refers/contains five “components”: (1) mutual trust, (2) reciprocal commitment, (3) effective communication, (4) integrative conflict management, (5) the dyadic culture. In comparison with the first four components, the fifth component (the dyadic culture) represent our personal addition to the model and also to the extant alliance literature (see Figure 1).

Now after that the RGM concept should be clear, on the subsequent paragraphs, let enter a little bit in-depth and discuss more in detail each component forming the RGM (if we prefer or like to tell, the relational capital or the relationship’s social components) and how the managers can build the RGM toward the construction of a stable and long-term oriented relationship with the final purpose of increasing firm’s innovative performance and productivity.

2.3 Building the Relational Governance Mechanism

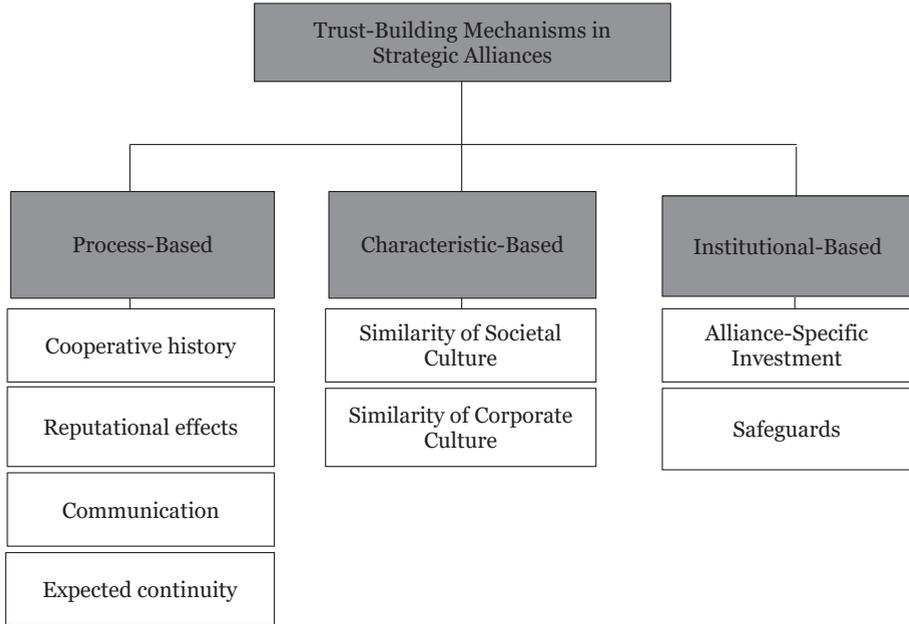
2.3.1 Building the mutual trust

Within the international literature, there is an emerging consensus between alliance scholars stating that mutual trust creates the basis for enduring and effective collaborative relationships (Kale *et al.*, 2000). Trust is defined as the willingness of a party to be vulnerable to the actions of another party based on the expectation that the other will perform only actions that will not damage the parent company (Meier *et al.*, 2016). Many studies had found that building trust is important and positively related to increasing the collaboration’s performance (Bener and Glaister, 2010; Kauser and Shaw, 2004; Meier *et al.*, 2016; Moeller, 2010; Sarkar *et al.*, 2001). Rindfleisch (2000) had found also that building trust is important because enhances the cooperation between partner firms in vertical alliances. In this sense, trust is viewed as an effective tool used by the parent firm to enable and promotes cooperative behaviors. On the same time, building trust with the alliance partner can be view as an effective mechanism for limiting the partner opportunism (Das and Rahman, 2010; Kale *et al.*, 2000). Also, it promotes and support future transactions, makes partners more willingness to resolve the conflicts that may arise in a calm and a non-passionate manner and fosters the development of enduring and stable relationships (Meier *at al.*, 2016).

Matthias Maier and collaborators (2015) suggest that there are three trust-building mechanisms one firm may use to develop the relational governance with its partner: (1) process-based trust-building mechanism; (2) characteristic-based trust-building mechanism and (3) organizational-based trust-building mechanism (see Figure 2).

In our work, we adopt their approach (their model) and we build starting to their proposed components but integrating also other perspectives. (For example, the interorganizational routines proposed by Zollo and collaborators in 2002.) From their work, we have adopted *only* the components of the trust-building blocks, the subchapter’s content representing a literature review from our perspective. (How are looking these components for building trust from our view? How are looking these components from the perspective of building the overall RGM, not only for building trust?) Moreover, the main difference compared to Meier’s work is that we are integrating the three mechanisms in one singular component and suggest that building mutual trust is a principal component of the RGM. Also, building trust is only a subcomponent of the RGM and we argue that sometimes is one minor in importance. (The RGM is much more complex than simply building trust and friendship.) As suggested by Williamson (1985) cited by de Jong and Klein Woolthuis (2009) trust alone is not enough in setting and implementing collaborative strategies. On the subsequent paragraphs, we are describing each trust-building mechanism in detail in order to provide managers some useful tools at the point they start or rethink building the RGM.

Figure 2. Trust-building mechanisms in strategic alliances



Source: Meier *et al.*, 2016.

Taking advantage of previous cooperative relationship or using reputation

Zollo *et al.* (2002) suggest that due to previous relationships, between partner firms are likely to develop a set of stable patterns of interaction developed and enriched in the course of repeated collaborations. The authors conceptualize this phenomenon such as interorganizational routines. We argue that these routines will set the foundation for building the RGM and will act as a catalysator for the development of “kindship ties” which arise since the individuals involved in the alliance work together for a long period (Meier *et al.*, 2016). This type of ties developed at individual level is more likely to lead toward the creation of trust in contrast with firms which do not have any previous collaborative experience (Zollo *et al.*, 2002). Therefore, managers may use some individuals which have worked previously with the partner as key boundary spanners for building trust between the alliance partners. Sarkar and collaborators (2001) argue that this type of links at individual level provide the glue that retain the firms toward working together for a long period. Managers responsible for the formulation and implementation of the collaborative strategies of their companies may benefit from these type of kindship ties formed at individual level to foster trust. Alternatively, as suggested by Maier and collaborators (2015) if between the partner firms do not exist previous alliances, the managers may consider the partner reputation as an indicator for the level of trust that may be involved in the relationship and to guide the firm in adopting the decision with whom and how to build trust.

Promoting effective communication

Other attribute the managers may use toward building trust is opening sufficient and adequate communication channels. Communication is a critical factor in achieving alliance success (Kausser and Shawn, 2004). Choi *et al.* (2010) argue that there are four communication factors affecting the performance in strategic alliances. First, they should assure a sufficient frequency at all the hierarchical levels – top management, middle management, line management and operational – for both types of organizational communication: formal and informal. We argue that the partner firms in order to build trust is necessary to communicate to each other daily, monthly, or every time the needs to implement the common strategy requires. Other important aspect is that communication should be unrestrained. Both types of communication (formal and informal) should be use. Regarding the communication efficacy, empirical evidence suggests that both factors should be present and considered in one alliance: two-way and participative communication (Choi *et al.*, 2010). Therefore, the transparency of information between each party plays an important role in fostering trust between collaborators (Wahyuni *et al.*, 2007). Since communication plays a critical role in achieving superior performance, we argue that this factor is a principal

component of the overall RGM. Therefore, we will approach more in detail the interorganizational communication latter on the subsequent subchapters.

Building trust through applying a long-term perspective

Some alliance scholars argue that the companies with a short or limited time horizon in mind will be interested in maximizing their own short-term gains rather than committing and working for the relationship in the long-run (Das and Rahman, 2010; Parkhe, 1993). Parkhe (1993) had found that there is a positive correlation between the “shadow of the future” and the partner opportunism reduction. One tool the managers may use in building a stable and effective relationship is through creatively joint search for future alliance opportunities. As suggested by Holmberg and Cummings (2009) the managers responsible with the collaborative strategies of their firms may search and brainstorm for alliance opportunities at the industry or segment level first, and then pass at the firm level and select the partner firm. The point here is that the alliance managers may find more alliance opportunities with the same partner if they proactively scan for joint allying opportunities at the industry and segment level first.

Looking for similarities in the organizational and national culture

Research suggest that similarity in the organizational cultures is a good predictor of superior performance and to having a satisfactory relationship (Bener and Glaister, 2010; Nielsen and Gudergan, 2012). The organizational culture refers to a set of norms, values, beliefs and symbols shared among the boundaries of a firm (www.gert-hofstede.com). With respect to the national culture, there is some empirical support suggesting that differences in national culture do not impact the performance in strategic alliances (Bener and Glaister, 2010; Nielsen and Gudergan, 2012). However, the managers involved in building trust activities may rely on these elements of culture similarity (national and organizational) in partner organizations in order to achieve a higher level of interfirm trust and a more effective RGM. Rather than emphasize on cultural differences (Irimias, 2013; Marga, 2005) we suggest that the managers may rely on the similarities between the organizational and national cultures with the purpose of building trust and an effective RGM. For example, since in many countries and organizations drinking a cafe at the workplace, before starting the job, represent a cultural norm and a well-defined custom, this well come time can be used to communicate, socialize and build trust between individuals involved in the alliance.

Investing in assets tailored to the relationship

Through investing in assets tailored to the relationship the partners probably will accept their own vulnerability and will hope to promote interdependence between each other (Meier *et al.*, 2016). At the same time, as suggested by

Parkhe (1993), Das and Rahman (2010) and other alliance theorists, partner investments in assets tailored to one collaboration would act as a hostage, probably deterring partner firm's opportunistic behavior. In this line of thinking, we argue that in order to build trust and enhance the RGM, the managers may negotiate that the partner firm put in the alliance resources and competences that are valuable, rare, non-facile imitable and available to be exploited (Hitt *et al.*, 2007). From the general RGM perspective, the active participation of a partner in one collaboration may enhance the probability of building trust and attaining also an adequate level of commitment (Andresen *et al.*, 2012). This aspect will be discussed on the subsequent paragraphs.

2.3.2 Building the reciprocal commitment

The second component of the RGM is the reciprocal commitment (RC). The RC is defined as the degree to which the alliance partners have close, long-term relationship with one another (Andresen *et al.*, 2012, p. 532). Research had demonstrated that the RC represents a critical factor if the partners want to build long-term relationships (Moeller, 2010). According to Kauser and Shawn (2004) the partners' commitment to a relationship reflects the implicit pledge of relational continuity between the exchange partners. They show commitment through their willingness to adopt a long-term perspective in the relationship. The RC reflects also the emotional ties between individuals involved in the alliance. This notion was conceptualized such as affective commitment (Kauser and Shaw, 2004). Andresen and collaborators (2012) suggest that there are four factors that influence the commitment of a firm to a network, or in our case, to a relationship: (1) trust, (2) a favorable experience with the relationship, (3) the communication design and (4) the content and the relationship's length. The researchers argue also that the commitment can be attitudinal or behavioral. In the first case, the attitudinal commitment reflects the firm's perspective and intentions regarding the collaboration (Andresen *et al.*, 2012). The attitudinal commitment has lot to do with initial goals setting and partner's motivation. It can be improved through involving the partner in goals setting, in building the common strategy and through aligning organizations' individuals' goals. In the second case, the behavioral commitment specifies what is really done within the collaboration (Andresen *et al.*, 2012). In order to build the RC, the managers may enhance the behavioral component through trying to improve members' enthusiasm and through setting common activities such as seminars, meetings and workshops. Through participating in such common activities, the individuals involved in the alliance may learn operational know-how in order to better do with the specific tasks, and also take contact with their peers. As previously suggested, setting common long-term goals is a valuable tool and

is expected to lead toward building effective RC and consequently to improve collaborations' performance. The RC is also influenced by the investment level and the specific assets involved in the collaboration. As suggested by Parkhe (1993) actively involving the partner in the alliance through direct investments, will act as a guaranty – partner's investments will be view as a hostage by the parent company – to attain an adequate level of commitment.

2.3.3 Building properly communication channels and bilateral information exchange

According to Bener and Glaister (2010), Kale *et al.*, (2000), Kauser and Shaw, (2004) the communication attributes and the bilateral information exchange represent one key factor in achieving dyadic strategic alliance success. This assumption may be true because ineffective communication may lead to misunderstandings, mistrust, a low level of commitment and several conflicts between the partners. In this sense, the effective communication becomes a collaboration asset that enables the partner firms to learn from each other, coordinate their activities and help them to maintain and develop a sound and a stable long-term relationship (Choi *et al.*, 2010). The creation and the development of communication skills becomes an essential aspect in strategic alliances since enable the partner firms to have a satisfactory relationship.

One particular set of communication skills, becomes important in the context of collaborative strategies: intercultural communication skills (Irimias, 2013; Marga, 2005). In order to build an effective relational capital, the managers and also their staff who work in the alliance, have to understand and respect the cultural differences that may exist between them. In this line of thinking, they should become aware of partners' cultural differences and explore their similarities rather than emphasize only on cultural differences (Irimias, 2013; Marga, 2005). We argue that this specific set of skills may help the partners to communicate effectively to each other and to build an efficient bilateral information exchange mechanism.

Some effective tools the managers may use toward building an effective and efficient communication system between the partner organizations. For instance, through cultivating and promoting at individual level seminars, programs, workshops for the purpose of building a strong multicultural oriented interorganizational culture. In this way, the partner firms' managers and their staff involved in the alliance will gain intercultural working abilities and competencies in order to properly do with specific alliance tasks. For example, the alliance manager responsible with the collaboration between the firm A and the firm B can learn through these courses how to manage the relationship, when to terminate the collaboration, or how to change and adapt the governance mechanism during

the implementation. Moreover, two communication's aspects are important in strategic alliances context: (1) communication frequency and (2) communication efficacy (Choi *et al.*, 2010). We argue that both should be well developed in order to build an effective communication system and an effective RGM.

2.3.4 Integrative conflict solving

Integrative conflict management entails the joint management of conflicts with mutual concern for 'win-win' for all the partners involved in the alliance (Kale *et al.*, 2000, p.222). Das and Teng (2000) reveal that the strategic direction the managers may use in guiding the behavior of their company in the collaborative activities is toward obtaining other firm's valuable resources and on the same time, protect own resources and core competencies. As suggested by Kale and collaborators (2000) building the relational capital together with solving the problems that may arise during the collaboration in an integrative manner would increase the probability of achieving both antithetical objectives: protection of proprietary core assets and maximizing the access at partner's valuable resources.

One effective tool the managers involved in interorganizational relationships may use to solve the conflicts together is through promoting an open and clear communication between the partners (Irimias, 2013). Two-way and participative communication, formal and informal, all may be suitable for building adequate communication channels between the allying firms (Choi *et al.*, 2010). Strong two-way communication is a key element of successful conflict resolution (Kale *et al.*, 2000). At the same time, some degree of tolerance and forbearance should be promoted and the individuals involved in alliance should be open-minded and adapt to cultural differences (Irimias, 2013, Marga, 2005).

One key factor in effective joint solving conflicts is through involving in the alliance individuals which possess strong negotiation skills. Das and Kumar (2011) argue that there are four types of negotiation strategies the alliance managers may use in order to solve the problems and the misunderstandings that may arise during the collaboration. The alliance managers will obtain different results depending on the type chose. In this sense, we argue that through adopting a joint solving problem negotiation strategy will probably add to the alliance the most value and the most chances to build an effective relational capital. However, due to the new competitive landscape firms may face, due to the arising of the hypercompetitive context (Hitt *et al.*, 2007) this type of negotiation strategy will not be always the most suitable. The parent firm may find itself in a competitive position that is no more favorable and the collaboration does not add any more sufficient value. In these circumstances, instead of abandoning the overall benefits that may be obtained through the collaboration, the firms may militate for start committing to the collaboration a less quantity of resources, careful

controlled and perhaps, reformulate goals that are most probably to be achieved through the reduced quantity of resources committed to the alliance (Oxley and Sampson, 2004). In this sense, a contending, yielding or compromising negotiation strategy may be also suitable in order to facilitate the achievement of the parent's firm collaborative objectives (Das and Kumar, 2011).

As argued earlier, intercultural communication skills are very important for the alliance managers involved in building the relational capital with the partner firms (Irimias, 2013; Marga, 2005). Being open-minded, tolerated, aware regarding the cultural differences that may exist and accepting different ways of doing things, may become important sources of competitive advantage in the context of the collaborative strategies. As suggested by anthropologists Kevin Avruch and Peter Black (1993) – cited by Irimias (2013) – one important aspect (especially in the alliances context) the managers and the employees should considerate is the dictum: *respecting our differences and working together*. In order to solve the problems and the misunderstandings creatively, in a calm manner and toward a win-win approach (Kale *et al.*, 2000) the individuals involved in the relationship should be aware of these cultural differences and manage themselves to adapt and facilitate the accomplishment of the alliance objectives. But for all these factors to be implemented is necessary to build first a multicultural interorganizational culture at the dyadic level.

2.3.5 Building the dyadic culture

Hitt and collaborators (2007) outline that an important aspect toward the achievement of an efficient strategy implementation is through building an adequate organizational culture who needs to facilitate the strategy implementation. In this line of thinking, we argue that for effective collaborative strategy implementation's accomplishment, the partner firms can monitor to build a kind a dyadic culture between the alliance members. The multicultural oriented parent's organizational culture promoted at the firm level would act as a mediator between parent firm's collaboration capabilities and the future collaboration's performance (Luvison and de Man, 2015). As suggested by Luvison and de Man (2015) building the alliance capabilities is not enough for achieving success in strategic alliances. Firms need also to create an alliance supportive culture toward collaboration at the firm level that will act as a mediator between the firm's alliance competences and the firm's alliance performance. We argue that this supportive alliance culture should be created also at the collaboration level. Moreover, we argue that this type of supportive culture should be one open to cultural differences and will act as a catalysator for any alliance abilities the partner firms may have. In the absence of a such culture, the alliance abilities the firms possess will not be fully utilized at their maximum capacity.

All social units develop a culture (Irimias, 2013). Through building the dyadic culture the partner firms will create a set of common shared norms, beliefs, values and behaviors that will help the managers or the individuals involved in the alliance through guiding their behavior and attitude toward joint solving problems and adopting a win-win approach for all the alliance members (Kale *et al.*, 2000; Luvison and de Man, 2015). As outlined previously, the degree to which the individuals involved in alliance will tolerate and accept their cultural differences will help the partner firms in building the dyadic culture, improve the firms' performance and develop a stable and effective long-term relationship.

As we have outlined previously the alliance researchers and the practitioners should differentiate between the components of the RGM and the tools/activities used to build it. As we can observe along the literature review, for the purpose of building or enhancing the RGM (or to enhance each component independently) between the partner firms, the alliance managers may use concomitant formal legal, formal non-legal or informal tools (see the Figure 3). For example, through elaborating a lower level of contractual complexity, showing that the parent firm trust in its alliance partner. Or, through realizing frequent visits to partner's facilities. (Of course, in the Gentlemen's Agreement partnerships the relationship will be implemented only through the RGM and only through informal tools.)

Now after that we have seen what components contains the RGM and how the managers of the partner firms may create it or enhancing it, let see on the subsequent paragraphs how does it look the RGM in the economic reality. In this sense, we have investigated the RGM in five vertical strategic alliances formed in Romania and starting with this page will discuss how the managers of the partner firms have built the RGM and the social ties between the employees who directly work in the alliance.

3. Methodology

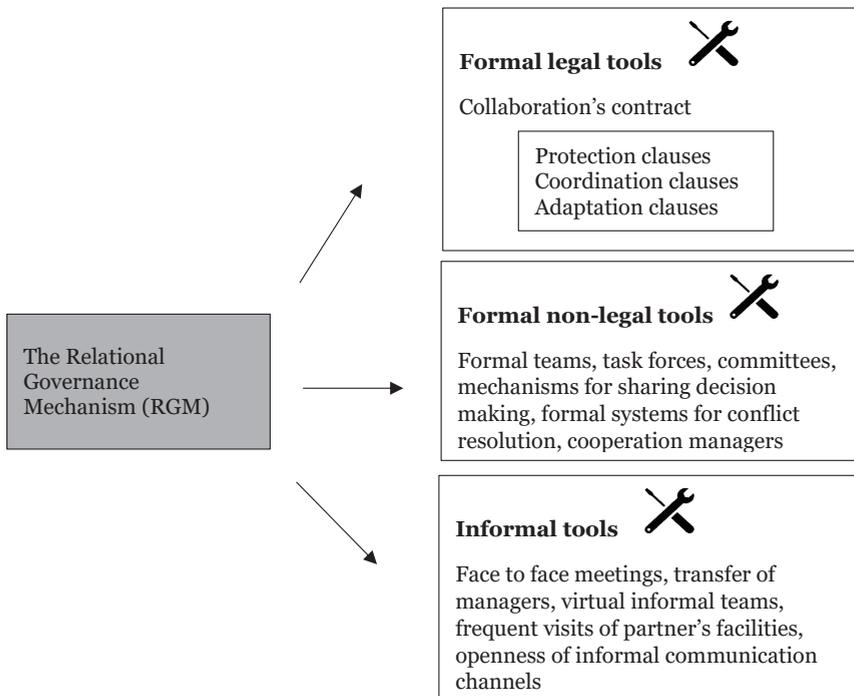
Sampling frame and respondents

This study is based on qualitative data on international and local vertical strategic alliances. All the parent companies are Romania based. Five relevant cases were selected for the study. The cases were selected from a broader list of cases in a larger project on the base of their relevance as extreme cases. We have chosen the cases that were characterized by the lowest RGM and those characterized by the highest RGM in order to see how they have built the RGM with their partners and if there exist some differences in their approach to build their RGM, depending their degree of orientation toward the implementation through social aspects and RGM or through FGM. Studying the extremes, it is a suitable research strategy in qualitative studies conducted in management and organizational research (Allard-Poesi, 2017). In this sense, in our sample, we

have chosen two cases that are characterized by a low to medium level and three by a higher level of trust, commitment, friendship and social embeddedness.

The study is based on interviews with experts from practice and analysis of secondary data. We carried out five explorative interviews with the executives most knowledgeable with the formation and operationalization of the alliance. We interviewed the managers only from one partner and operationally the interviews were tape-recorded and then transcribed. The interviews were semistructured and exploratory oriented and lasted between 45 minutes and one hour. Exploratory interviews allowed us to explore this phenomenon under its main facets and facilitate us to make a comparison between the cases selected (Wahyuni *et al.*, 2007).

Figure 3. Tools to use for building or enhancing the Relational Governance Mechanism



Source: authors' own elaboration.

Regarding the respondents' hierarchical position in their organizations they are all top executives with solid background in management and aware with the formation and also the implementation of collaborative strategies. From the five collaborations selected three are international and two collaborations

are domestic. We have chosen also international and domestic alliances to observe if there are some differences in alliances formed between Romanian firms and international partners in comparison with alliances formed only between Romanian partners. All the alliances studied are formed between two partners and the unit of analysis of our study is the individual alliance (the collaboration).

For confidentiality reasons, we do not provide the names of the participating firms. In this line of thinking, we need first to frame and classify each collaboration and each participating firm. Therefore, will term the alliance A, B, C, D and E for each case. Regarding the participating firms, since the alliance studied are formed only between two partners will term the partners as the parent company, respectively the partner company. For more details and an integrative view of the firms and the respondents' characteristics participating in our study see the Table 1.

According to sociologist Septimiu Chelcea (2007) in qualitative studies the characteristic of the persons interviewed becomes important aspects that the researchers should take into account. In this line of thinking, in our study we have discuss how is looking the RGM between the partner firms and we will illustrate with examples and assumptions of the managers interviewed depending on two personal characteristics: their age and their managerial experience.

4. Findings

4.1 Intra-case findings

The strategic alliance A

The first collaboration in our study is a vertical agreement between one medium size enterprise, operating within the construction industry and its supplier of raw materials. At the point the alliance was formed there was lots of hours of negotiations. First, the lawyers of the parent company had designed and sent to the parent company the contract for collaboration. At this point, the partner firm read the contract and because they do not agree with some clauses and with some clauses that had not been included, they resent the contract to their lawyers for changes and addition of supplementary clauses. Forwards, the contract was resent to the parent firm which in turn do not agreed with the new clauses added by the partner firm's lawyers. And the contract was resent to be reviewed by the parent firm's lawyers. In this way, the process of negotiation has lasted several months. The executive interviewed told us that in general firms relations with its suppliers are implemented by complex contracts with lot of clauses, mainly because the partner firms have their lawyers who elaborate very detailed contracts. In the words of the parent firm's manager:

Table 1. The participating firms and respondents

Case selected	Partners characteristics	Alliance type/ Business Unit Level strategy	Internationality	Corporate/firm level strategy	Industry
Alliance A Key Informant details	The parent firm: Medium firm (Romania) The partner firm: Large firm (Romania) <i>Hierarchical level:</i> Economic Director <i>Age:</i> 53 years old <i>Managerial experience:</i> 13 years	Production (raw materials procurement)	Domestic	Strategic Partnership	Construction
Alliance B Key Informant details	The parent firm: Small firm (Romania) The partner firm: Large firm (Denmark) <i>Hierarchical level:</i> CEO <i>Age:</i> 41 years old <i>Managerial experience:</i> 20 years	Marketing (distribution agreement)	International	Strategic Partnership	Medical devices
Alliance C <i>Hierarchical level:</i> Technical Director <i>Age:</i> 50 years old <i>Managerial experience:</i> 10 years	The parent firm: Small firm (Romania) The partner firm: Large firm (Spain)	Marketing (distribution agreement)	International	Strategic Partnership	Engineering, Mechanics
Alliance D <i>Hierarchical level:</i> Managing Director <i>Age:</i> 42 years old <i>Managerial experience:</i> 12 years	The parent firm: Large firm (Romania) The partner firm: Small firm (Romania)	Production (raw materials procurement)	Domestic	Strategic Partnership	Manufacturing furniture
Alliance E <i>Hierarchical level:</i> CEO <i>Age:</i> 42 years old <i>Managerial experience:</i> 15 years	The parent firm: medium firm (Romania) The partner firm: large firm (Italy)	Marketing (distribution agreement)	International	Formal Non-Equity Strategic Alliance	Construction

Source: authors' own creation based on official data from Ministry of Finance in Romania.

“Our contracts are very bushy and very complex. They have lawyers who elaborate contracts with many details and very strict clauses. Our contracts with our suppliers have an average 10 pages of details. There are clauses regarding what is gone happen if you don’t pay at time, some penalties if they don’t provide the materials at time and so on.” (M.C., 53 years old, 13-years managerial experience)

This example provides us with an overall image regarding what is the implementation through the FGM. As this case illustrates, this relationship is based on legally binding agreements and the collaboration it is implemented mainly through the FGM. After data procession, we have observed that in this case, the FGM is effectively complemented with relational attributes such trust, benevolence, effective communication channels in order that the collaboration be effective. For the purpose of enhancing the RGM between the partners, the alliance partners had fund a tight link between two departments in each firm. The link was formed between parent firm acquisition department with the partner firm sales department. Moreover, the RGM was formed at individual level between direct employees in those departments who directly work in alliance issues. Between them built trust and a satisfactory relationship based on reciprocal commitment. The importance of commitment was mentioned also by the manager interviewed:

“A certain level of trust and commitment is absolutely necessary. We cannot offer our service to customers if we do not have their support.” (M.C., 53 years old, 13-years managerial experience)

As this case illustrates, a minimum level of relational attributes is necessary even in alliances characterized by a higher level of FGM. In the first strategic alliance examined, trust had been built especially through contract clauses accomplishment, such as collaboration’s goals, terms, quality of the raw materials provided etc. Additionally, within the alliance A, the trust is enhanced by the seriousness of the employees who work in the alliance, by the quality of their work, and by frequent visits made by the partner firm sales representatives at the parent firm facilities. In order that the collaboration be more successful, the sales representatives have also sometimes discussions and meetings with the executive responsible with the alliances in the parent firm. They present company’s new products and create in this mode a shadow for the future for possible alliance opportunities between the alliance members.

In our first case, the communication is facilitated by adequate communication channels opened between the partner firms, particularly between the sales representatives of the seller and the acquisition department employees in

the buyer. An adequate frequency is assured through various visits sales representatives made at the parent firm. Alternatively, communication efficacy is enhanced through valuable, updated, and secured information regarding the products portfolio of the seller.

Table 2. The RGM in the strategic alliance A

RGM components	The variable in the case selected	The tools used by managers
Mutual trust	Medium	<u>Formal tools</u> Contract clauses
Reciprocal commitment	Medium	
Effective communication	Medium	<u>Informal tools</u>
Integrative conflict management	Low	A link between departments; Frequent visits and meetings; Emergent meetings with the partner's executives.
Dyadic culture	Low	

Source: authors' own creation.

As a conclusion, in the first case, the RGM was built and enhanced through informal tools such as frequent visits, an open and a clear communication channel and through setting a link between direct employees in two departments in each firm who directly work in the alliance. (See the Table 2.)

The strategic alliance B

The second case is also a vertical alliance but this time takes the form of an international distribution agreement between a Danish medical devices manufacturer and its distributor in Romania. The purpose for the alliance formation is the distribution and the implementation of medical devices such as blood gas analyzer, immunoassay testing devices, transcutaneous monitoring or diabetes analyzer and monitor devices into Romanian hospitals, medical institutions and universities.

As the previous case, the strategic alliance B is also characterized by a higher level of FGM. The contract put in place to manage the relationship contains strict clauses and sales objectives which the distributor (the parent company) must accomplish within each year of agreement. During the collaboration, the Danish based corporation has implemented several series of trainings and courses for the purpose that the distributor be more efficient in sales and to better know the seller's medical sophisticated and innovative products. Through these courses the firms have built an adequate level of trust between them. In this case, the

trust is also enhanced through a very good relationship at the top management level. Additionally, the interviewed told us that the partner’s high international reputation had been a key factor at the point the alliance was set.

Moreover, for the purpose that the alliance be more effective and the distributor achieve more sales, better quality in products’ implementation and operationalization, between the partner firms there are various relational tools put in place to facilitate the sharing of resources and some operational know-how. For example, face-to-face meetings at operational level for training purposes, or top management business meetings once a year or more frequently.

The collaboration is characterized by a moderated level of commitment. This moderated level of commitment is partially due partner firm’s attitudinal commitment. Since the Danish firm is a large and powerful corporation they have R&D departments through which they bring to the market new innovative well come medical devices and does not count on the given input of a smaller company operating in a smaller market, that sometimes can be very useful. As suggested by the manager interviewed:

“This type of partners does not really expect from us to come with new ideas or solutions for their products. Since they have strong R&D capabilities they dictate the game’s rules and they tell us what to do. They do not really listen to us and do not count on our input since we area a such small market. But, if we were China or Russia perhaps they would take us into consideration.” (M.G., 41 years old, 20-years managerial experience)

Table 3. The RGM in the strategic alliance B

RGM components	The variable in the case selected	The tools used by managers
Mutual trust	Medium	<u>Formal tools</u> Contractual clauses
Reciprocal commitment	Medium	<u>Informal tools</u> Using reputation; Trainings and seminars; Frequent meetings at the top management level.
Effective communication	Medium	
Integrative conflict management	Low	
Dyadic culture	Low	

Source: authors’ own elaboration.

In this case, the FGM put in place by the Danish firm is very strict and rigid, oriented toward contracts’ clauses accomplishment. The Danish firm being the powerful part in the collaboration relates strongly on formal legal

tools for the purpose of achieving commitment, trust, and facilitate alliance's goals accomplishment. In the alliance B, the communication is better promoted between top management executives compared to the operational level. As we suggested above, the integrative conflict solving with a win-win concern for both parties is low since the Danish firm tries to impose its rules and do not take into consideration the parent firm assumptions. Of course, the dyadic culture is almost nonexistent between the partners (see the Table 3).

Overall, in the case B, the RGM's components was built through using reputation, through developing and implementing various trainings and seminars which the partner firm gives to the parent firm and through a very good relationship at the executive level.

The strategic alliance C

The third strategic alliance considered in our study is also one international distribution agreement and is formed between one small Romania based firm, operating within various mechanical industry segments and the Spanish based mechanical products manufacturer. The purpose for the alliance formation was the distribution of the sealing and insulation products, gasket sheets and mechanical packing for pumps in Romania.

At the base of collaboration is the contract put in place to manage the relationship and an effective trust-based relational governance created to manage the evolution. In order that the collaboration achieves its objectives between the partner firms there are tight links at operational level between individuals who work in the alliance. Every day, there are formal and informal phone callings between the partners employees. Also, several times per year Spanish firms' representatives come to Romania to visit parent firm facilities such as the warehouses, the distribution channels, the quality of post-selling support etc. Alternatively, parent firms' employees also travel once a year or more often to Spain in order to gain operational knowledge regarding products and implementation of the products into the Romanian market. For example, they learn from their Spanish peers how the products are built, how to operationalize the products, or how to better deal with this specific business transactions for the products that their company commercializes. As we can see, there are lot of RGM's activities between the partner firms. There are face-to-face meetings, phone call communications, operational learning courses (daily, monthly and yearly) all the times the implementation of the common strategy requires.

As in the previous cases there is also a contract put in place to manage the relationship, but the RGM prevails. The effective communication channels and the bilateral information exchange had favored trust and commitment building. There is also a very good relationship between partner firms' top management executives. One important aspect we observed, is that during the collaboration the

parent firm has introduced new product lines and because of the good relational capital between partner firms the contracts were maintained at the same level. Therefore, the effective RGM has favored enhancing the parent firm's innovative performance and its incomes, without a direct increase in transactional costs. Also, it has contributed to partner firm's sales enhancement. In this case, because of the frequent interaction and the higher level of firms' integration we can speak about a kind of dyadic culture creation based on effective communication, interorganizational routines, trust and intercultural awareness between individuals involved within the alliance (see Table 4).

Table 4. The RGM in the strategic alliance C

RGM components	The variable in the case selected	The tools used by managers
Mutual trust	Medium-High	<u>Formal tools</u> Contractual clauses
Reciprocal commitment	Medium-High	<u>Informal tools</u>
Effective communication	Medium-High	Using reputation; Trainings and seminars; Frequent meetings at operational and top management level;
Integrative conflict management	Medium	Tours and manufacturing plants visits;
Dyadic culture	Low-Medium	Day-to-day or weekly telephone calls.

Source: authors' own creation.

As a conclusion, in the strategic alliance C the partners are more integrated and communicate with more frequency than in the previous cases. In this case, there is formed a dyadic culture between the alliance members. Even if there is the common culture put in place and the trust, commitment and the communication are more developed compared with the cases A and B there is not an integrative win-win approach toward building a common future. In this case, like in the case B, the partner firm being a powerful international corporation tries to impose the game's rules and do not count on the input given by the smaller firm.

The strategic alliance D

The next strategic alliance described is a vertical alliance between a Swedish furniture manufacturer and one of its suppliers in Romania. The parent firm is a FDI (Foreign Direct Investment) of a historically and prestigious Swedish furniture manufacturer in Romania. The Romanian subsidiary was created in 2003 at the time the Swedish manufacturer came into Romania. On our days,

the Romanian subsidiary is a new legally and independent entity owned mainly by the mother company. In our study, in the context of the strategic alliance studied, we term the Swedish FDI subsidiary the parent firm and the supplier the partner firm.

The alliance was formed for the purpose to supply the parent firm with components which will be then integrated within the furniture line of the parent firm. As in the previous cases, there is the collaboration contract between the partners firms but the level of the contractual complexity is the lowest in our study and the level of RGM put in place to manage the relationship is the highest. In this sense, there is a very, very simple contract between the partner firms. There are clauses such as: the costs of components, deals of how to not become out of orders, prices, etc. but most of the relationship's management is assured through the RGM. As the interviewed told me:

“We have very tight links with the partner firm, but much of the collaboration is based on Gentlemen’s Agreement, good breeding, sincerity and a lot of trust. At the point we signed the contract we put everything I think, in two pages. That’s it! There is no hidden agenda. There is a win-win approach on long-term.” (C.W., 42 years old, 12-years managerial experience)

In this case, at the base of building trust relied previous cooperative relationships and friendship ties between the CEO of the parent firm and the managers of the partner firm. The manager interviewed told me that at the base of alliance formation stood the previous common experiences with the partner firm's managers and their technical know-how. The parent firm also built its RGM with its partner through relying on similarities in the national culture. As the manager interviewed told me:

“Three years ago we had identified the opportunity to produce some components (that are integrated in our products) in one factory in Romania. We bought previously those components in big quantities and very expensive from Germany and Poland. Initial, I totally agree to introduce the production line in our factory but after some analysis I observed that occupies too much space and hamper the daily routines and the operational processes. Then I thought: and if we can outsource the components’ production to a partner firm? Then I spoke with some young Swedish friends that I knew from years and that had the technical expertise needed and I told them to come to Romania and open a new business to manufacture components for our firm. In some months, they came to Romania and had launched the new

enterprise and now they produce components only for our company.”
(C.W., 42 years old, 12-years managerial experience)

Within the strategic alliance D there is also a higher level of reciprocal commitment. Especially, the attitudinal component of commitment which is assured by the parent firm through involving the partner in planning and goals setting. For example, when the parent firm negotiate some aspects with its customers they try to bring also their partner into negotiation, because there can be in discussion important aspects of components suppling, or the supplier perspective may be important (e.g. quality, price setting agreements). On the other hand, the behavioral commitment is also high since there are face-to-face meetings between the executives and a very good relation based on friendship. The behavioral component of commitment is also enhanced through very much entrepreneurial orientation promotion. In this way, the parent firm permanently encourages its partner to become better and better.

The RGM in this alliance is also built and enhanced through joint participating in workshops and seminars offered by furniture experts with the purpose of improving the operations and the processes within the factories.

Table 5. The RGM in the strategic alliance D

RGM components	The variable in the case selected	The tools used by managers
Mutual trust	High	<u>Formal tools</u> Contractual clauses
Reciprocal commitment	High	<u>Informal tools</u>
Effective communication	High	Taking advantages of previous relationships;
Integrative conflict management	High	Using reputation; Exploiting the similarities in the national culture; Joint participation in trainings, seminars and workshops;
Dyadic culture	High	Frequent communication at operational and top management level; Entrepreneurial orientation encouraging.

Source: authors' own creation.

In the strategic alliance D, there are put in place communication channels at two levels: one at the acquisition level and one at the top management level. At the acquisition level, normally there are operational issues discussed. On the other

hand, at the executive level many times the partner firm's managers since they are new comers in Romania they look for support and some advices regarding the market and market needs from parent firm's CEO. This frequent, formal and informal communication, tight friendship ties, together with transparency and a lot of confidence have lead the collaboration to be a good example of how building the RGM may lead to strategic alliance success.

As a conclusion, in our sample the strategic alliance D is the collaboration with the most developed RGM (see Table 5). All the RGM's components are well developed, the partners share a common strategic direction and work together toward building a common future.

The strategic alliance E

The fifth strategic alliance is a vertical international alliance and takes the form of a distribution agreement. The alliance scope is to distribute, commercialize and implement gate automation systems, automatic barriers and garage door automations in Romania. At the point the alliance was set there was lot of hours of negotiation, in the words of the parent firm CEO: "hundreds of hours of negotiation". There were lots of discussions regarding the prices, the commercial conditions, the distribution, the products' catalogs etc. Nevertheless, were necessary many hours of negotiation since the complexity of the alliance is very high, the goods turnover is rounding hundreds of thousands of euro and the partner firms where new partners and do not have any prior collaborative experience. However, the parent firm also had used partner's reputation at the base of alliance formation and for building trust.

At the beginning of the relationship the level of trust between the partners was low and there was not interorganizational routines put in place in order to realize the uniformity of the image, service or quality. Therefore, at the point the alliance was set the partner firms resorted in building an effective legal FGM in order to build trust, achieve commitment and facilitate the achievement of the common goals. Forwards, the partners formally set an alliance team to work in alliance issues. The relationship is implemented through this alliance team. There is also an alliance manager in the parent firm who is in charge with the collaboration. In addition, there are tight links and communication channels opened between the marketing department in the parent firm and the marketing department in the partner firm. And a third channel is opened at the top management/executives' level.

Nevertheless, the contracts play an important role in managing this alliance since the commitment is achieved through including clear goals and time-related clauses within the contract. Since, the partner firm is a large and powerful player they have the power, for example, to specify how their products

should be implemented in Romania. In this sense, the reciprocal commitment in the alliance E is high and is achieved mainly through joint involvement in goals setting and joint planning. Also, there is a continuous and a frequent communication between the partner firms. The partners are closely connected and there are tight links thorough the alliance team.

Overall, the interplay of FGM and RGM in this case is balanced. There is a higher level of FGM due to the higher complexity of the alliance but there is also an effective RGM put in place by the alliance members in order to build trust, achieve commitment and facilitate alliance's goals achievement. Moreover, in this alliance, there is a certain degree of intercultural awareness between the partner firms. There is a certain level of tolerance, cultural differences awareness, and understanding different ways of doing things. "They understand a different market from, let say Germany", the manager told me.

Regarding the importance of the RGM's creation, remarkable is the ascertainment of the parent's firm CEO:

"We have collaborators with whom even we do not have any contract. Is true, the sums are not as high as in this collaboration (the alliance which was the subject of analysis) but there are lots of other type of attributes that are important. Everything is based on the empathy between employees and managers who work in the alliance, because the people can create a harmony where even is not necessary to exist contracts. In fact, the contract is not so important. The contract is used to regulate some aspects especially where you cannot do anything. For example, where there are important differences between partners' power. In our collaborations, for more than half of them, we do not have any contract." (R.O., 42 years old, 15-years managerial experience)

In this case, there is the alliance team, face-to-face meetings, and the appointment of an alliance manager that contribute to enhancing the RGM between the alliance members (see the Table 6). Even if the alliance team do not work full time on alliance issues they are linked together and contribute to enhancing the relational capital between the partner firms which have result in an increase in alliance goals accomplishment and the satisfaction with the alliance.

We conclude the first part of our findings subchapter through presenting the managers' assumption regarding the implementation of collaborative strategies through the both distinct governance mechanisms. At the end of our interviews, we ask the managers the following question: "In your opinion, between the FGM and the RGM, which of them is more important for alliance's success?". At this question, all the managers told us that the RGM is far more important for alliance's goals accomplishment and for the alliance's success.

Table 6. The RGM in the strategic alliance E

RGM components	The variable in the case selected	The tools used by managers
		<u>Formal tools</u> Contractual clauses
Mutual trust	High	<u>Formal non-legal tools</u> The establishment of the alliance team; The appointment of an alliance manager; Formal joint marketing; Common goal settings and joint planning.
Reciprocal commitment	High	<u>Informal tools</u>
Effective communication	High	Using reputation;
Integrative conflict management	High	Frequent communication at operational, middle management and top management level.
Dyadic culture	High	

Source: authors' own creation.

4.2 Inter-cases findings

Discussing the RGM's extremes

From the cases selected, the alliances A and B are the relationships that less rely on building a RGM between the partner firms to implement the common strategy. More specifically are the firms in our sample with the less developed trust, commitment, communication, integrative conflict solving and without a dyadic culture, or not observable (see Table 7).

Table 7. Inter-cases comparison

Extremes	Low RGM	Medium RGM	High RGM
Cases/strategic alliances	A and B	C	D and E
Internationality	Local		International
Cases/strategic alliances	A and D		B, C and E
BU level alliance type	Production alliances		Marketing alliances
Cases/strategic alliances	A and D		B, C and E

Source: authors' own elaboration.

These facts, perhaps, are due to the lower complexity of the collaboration and the lower needs for interaction. However, we observed that some degree of relational capital is also present and built, in order to better implement the common strategy. For example, there is a minimum level of trust between the partners. If the construction firm in the alliance A cannot trust in the materials' quality and the accomplishment of the delivery time given by the partner firm, the parent firm itself cannot deliver a high-quality construction project to the final customer. Therefore, it needs to trust at least at minimum in its partner. In these cases, the RGM was built mainly through trust, commitment and through opening properly communication channels. In comparison with the other cases, the social relationships between the employees in the cases A and B are less developed. Even if there is some trust and commitment, there is not a win-win approach and a dyadic culture (observed in other cases) put in place to favor the common development for the future. This is a finding that informs the extant alliance literature that a certain level of trust, commitment, friendship, good-breeding and other social aspects should be built between persons in any collaboration.

In the alliance C, the needs for interaction and communication between employees are higher than in the cases A and B. Consequently, the relationship is more integrated and had favored building trust, commitment and effective communications. Between the partners involved in the alliance C the relational capital is higher than between the partners involved within the alliances A and B, but is less developed compared to the firms in the cases D and E. As in the previous cases, even if there are opened properly communication channels and a higher level of trust and commitment is built, there is not shared a common vision/direction for the future. The partners are not integrated as much as in the cases D and E to work together for the purpose of developing the relationship and building a common future.

Alternatively, the partners in the strategic alliances D and E are the firms that have found and relies more on effective social relationships development between employees in order to successfully implement the common strategy. In comparison with previous cases, in the alliances D and E the social relations between the employees are closer, there is more trust, friendship and commitment between them, they share a common vision, the relations are more integrated and they work together toward building a common future. In comparison with the previous cases, in the alliances D and E the RGM was built through all five RGM's components. Undoubtedly, the highest level of RGM was built because of the top management's commitment and because the executive team had favored building it.

Discussing FGM – RGM differences

Forwards, in order to better observe how the firms in our sample had built the RGM, we have to look also at the FGM and how it looks in our cases and observe if there are some differences that may impact building the RGM in the firms with higher level of FGM compared to the firms that rely on simpler level of FGM (see the Table 8).

Table 8. FGM vs RGM in our sample

Case selected	FGM	RGM
Alliance A	high	low
Alliance B	high	low
Alliance C	low-medium	medium
Alliance D	low	high
Alliance E	high	high

Source: authors' own elaboration.

In our study, the FGM complexity it seems that had not influenced the level of trust, commitment and other RGM's components building. As we can see in the Table 8 the partners that most rely on social aspects for implementation (such trust and friendship) are the partners in the alliances D and E. But the partners in these alliances are extreme cases in their FGM approaches. On the one hand, the partners in the alliance D are engaged into one Strategic Partnership (nearly to Gentlemen's Agreement type) and rely on a very simple contract to implement the strategy. On the other hand, the partners in the alliance E are engaged in one formal non-legal Strategic Alliance and the contract is very complex (because of the complexity of the alliance). There are non-legal tools such as the alliance team and an alliance manager put in place to manage the relationship. Therefore, the FGM is the highest in our sample. Despite their totally distinct approach regarding the implementation through FGM (one case with a very simple contract and the other with a very complex contract, plus formal non-legal structures), their RGM is well created in both cases and is the most developed. This finding supports our assumption that the RGM is complementary and distinct from the FGM, should be created additional to the FGM and is critical for implementation success, independently of the FGM.

Discussing the internationality differences

In this paragraph, we turned our look to a variable we call “the alliance’s internationality”. In this sense, we want to observe if there are some differences in how the partner firms had built the RGM in international alliances compared with domestic ones. As we can see in the Table 7, between the partners involved in the international strategic alliances B, C, and E there is a totally distinct development level of social aspects between the partner firms. For instance, between the international partners in the alliance B there is a low to medium level of trust, commitment, and other RGM’s components, between international partners in the alliance C there is a medium level and in the case E the RGM level is the highest one in our sample. In this sense, it seems that the national origin of the partner firms had not impacted how the partners had built trust, commitment and other RGM’s components and the degree of development of these social attributes.

Discussing the BU level alliance type differences

As we can see in the Table 7 the alliances A and D are formed for the same purpose: the procurement of raw materials needed for the production of goods. Despite the same objective and the same structure (Strategic Partnership), the partners in these alliances are extreme cases. On the one hand, the relationship between the partners in the alliance A is characterized by the highest FGM, a very complex contract and the lowest level of trust, friendship, commitment and other RGM’s components. On the other hand, the partners in the alliance D have elaborated a very simple contract and the relationship is based on a lot of trust, good breeding and a win-win approach on long term. Despite their similarity regarding the alliance’s goals, their approach toward building the RGM is distinct. Despite that there is trust, commitment, and properly communication channels in both antithetical cases, the main difference is on the win-win approach and the dyadic culture, components that are more developed between the partners in the strategic alliance D. On the same time, the partner firms involved in the marketing alliances B, C, and E, have also distinct levels of RGM’s attributes. In this sense, it seems that the alliance’s goals had not impacted firms’ building RGM approach.

As a conclusion, our findings inform the extant alliance literature that the legal structure, alliance’s internationality or the alliance’s purpose do not affect how the firms build the RGM in strategic alliances. Moreover, these variables it seems that do not influence the degree of trust, commitment, friendships and other social aspects built between persons who directly work in strategic alliances (less or more complex RGM). In addition, our work contributes to the extant alliance literature with several key findings see the Table 9.

Table 9. Key findings

At least a minimum level of trust, commitment and other social attributes should be built in any collaboration.

The alliances with more developed RGM's attributes compared with the alliances with less developed one, share and work together toward building a common future, share the same vision/direction and build a shadow for the future for the future development of the relationship (the fourth and the fifth components in the RGM make the difference).

The most successful partnerships are characterized by a higher level of relational attributes (RGM). In the relation FGM - RGM, the relational one is a complementary and an independent construct.

The previous alliance structure does not affect the level of RGM that should be built.

Between partner firms engaged in production alliances in comparison with the partners firms engaged in marketing alliances the RGM is not more developed or more efficient (or vice versa).

Between partner firms engaged in international alliances in comparison with the partners firms engaged in domestic alliances the RGM is not more developed or more efficient (or vice versa).

The RGM and the social relations between employees make the difference in achieving successful alliance implementation and the achievement of the alliance's goals.

Source: authors' own elaboration.

5. Study's limits and future avenues of research

As we have specified previously this study is based on qualitative data regarding international and domestic vertical strategic alliances. Despite the relevant managerial experience of the managers interviewed, one important aspect is that maybe there can be also other important individuals who may be aware regarding the alliances we have presented. In our study, we took only the key informant's perspective, which in all the cases was a top executive, from a collaborative strategy point of view. In other words, the interviewers' assumptions were regarding top management perspective regarding the implementation of the specific collaborative strategy/strategic alliance. Probably, one individual directly involved in the alliance's implementation would can add also valuable contributions regarding the implementation of the collaborative strategy. For example, the alliance manager in the case E, or the parent firm acquisition's department employees in the case D. Even so, our paper brings important contributions on the field of alliance governance since as we noted previously, for example, without the top management commitment and without the favored attitude toward social ties construction between employees, building the RGM would be hampered in its development.

Second, the perspective regarding the strategic alliance was took only from one partner. Will be interestingly to know the partner firm's perspective regarding

the specific collaboration they are involved with the parent firm. In this sense, more works in the field of RGM could come in order to examine the RGM from both partners' (or multipartners) perspective in one strategic alliance.

Third, as any exploratory and qualitative study this study also is largely based on subjective assumptions regarding the collaborative strategy's/strategic alliance's implementation. We have identified some patterns regarding how the firms studied had built the relational capital in one strategic alliance. Additionally, we have identified some useful tools managers may use in order to build the RGM toward achieving successful collaborative strategy implementation. Nevertheless, a strong and more in-depth comparison between the case A and B, for example, with more hours of interviews and more individuals involved from all the hierarchical levels would bring also valuable contributions. In this sense, our framework can be view as a starting point in developing more qualitative and quantitative papers in the field of the RGM.

6. Conclusions and managerial implications

This study has attempted to explain how the managers can build the RGM in strategic alliances. Through an integrative approach we discussed along the paper the components of the RGM and how can be enhanced each component during the implementation. We have also presented some tools that the managers may use in their approach toward building an effective RGM.

Forwards, through investigating five vertical strategic alliances between Romanian firms and their partners, we have observed that a certain degree of social attributes should be built in any collaboration in order that the collaboration achieves its objectives. Particularly, the RGM's components, mutual trust, reciprocal commitment and effective communication were the components most common used in all the cases. On the other hand, the win-win approach toward solving conflicts and building a dyadic culture for the purpose of building a common future were the distinctive RGM's attributes that made the difference between more successful partnerships and the medium successful ones.

In addition to the specific contributions for the alliance literature, the study overall has also several managerial implications. First, we argue that because the relational capital takes time to be built and involves lots of investments in the alliance, in simpler, non-high dependence based and short-term collaborations the relational capital can be kept at minimum. In consequence, the managers should not allocate excessive resources for building the RGM if the alliance goals not require these social aspects to be built. However, if the managers are more long term oriented and more open to entrepreneurial opportunities that may arise during the implementation they should consider to allocate resources for building an effective RGM and specifically, a dyadic culture between the partner

firms. Additionally, the RGM's attributes between the partners should be built at all the hierarchical levels not only between the managers. In this sense, the relational capital is a prerequisite for the evolution of the alliance in one more integrated and more complex collaboration such as a Minority Equity Alliance or for the purpose to setting a Joint Venture.

On the other hand, despite the higher importance of building the social ties, outlined in this paper, we argue also that in the Strategic Partnerships, Minority Equity Alliances or in the Joint Ventures the RGM and the social aspects should not overcome a certain level. For example, too much trust or too much communication in situations when these aspects are not necessary can hamper the alliance's performance. (There should be a certain level of *coopetition* between the employees who directly work in the alliance.) In this sense, our findings are important for the managers because provides them with a framework for helping them in building the social ties between the persons who work in the alliance and guide them in elaborating the decision on how much socialization should be between employees.

Second, our findings are useful for the managers who attempt to start building the relational capital with their partners – or improve it – through providing some tools that can be used to build each component of the overall RGM. We argue, that the RGM is composed from five components: mutual trust, reciprocal commitment, bilateral information exchange, integrative conflict solving and the dyadic culture which is the base and nurture the previous four components presented. The managers can use some tools (some presented in our work used by the firms we analyzed) such as face-to-face meetings, establishment of an alliance team, appointment of an alliance manager, frequent visits between partners, opening sufficient communication channels, in order to build and improve the RGM.

Third, as results from our study the RGM is a complementary and independent construct. In this line of thinking, we argue that the managers should devote more energy and allocate more resources in order to professionally build the RGM, independently of the previous legal structure (Strategic Partnership/Minority Equity Alliance/Joint Venture) chose to implement the common strategy. They should go beyond the classical view of RGM such as friendship and trusting ties between employees and adopt a more professional attitude toward building the RGM. Through doing so they will increase the probability of successful strategic alliance implementation and the accomplishment of the alliance's goals.

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JOB PROTECTION'S SECTORAL AND LOCAL ADJUSTMENTS – INSTRUMENT IN VIEW TO ACCELERATING ECO-INNOVATION ENACTMENT

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Abstract: Romania's transition towards the green economy is strongly heterogeneously in both terms: sectoral and spatial, with low performance of economy in innovation and eco-innovation. From the 81 sectors analysed more than a half needs to diminish a significant gap in productivities, while more than ¼ requests with high priority to be restructured – presenting clear alarm signals. The Anselin's Global spatial autocorrelation model confirm the tendency of clustering for the highly skilled workers in more than 4/5 sectors from 88 studied (Microdata– National Institute of Statistics), in HH location core clusters. These “brain hubs” or “innovation clusters” in the sense of Moretti (2012) indicates the importance of a smart employment protection legislation adjusting (EPL).

Key words: job protection; labour productivity; carbon productivity; eco-innovation; “brain hubs” or “innovation clusters”

JEL Classification: O11; O33; O44; J24; J80

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1. Introduction

Krugman *et al.* (1999) in *New Economy of Geography* explains how the production is heterogeneously distributed in space. Differences in development are explained in *Evolutionary Economic Geography* (EEG) literature in relation to the degree of “novelty” to the region. Morreti (2012) points out that high skilled agglomerations are the main factor of the “great divergence” in the USA. Complex problem-solving demands complex solution created by people with “independent judgement and the ability to create new ideas, new technologies, and new content” (Umpherson, 2015: online).

The agglomeration of the high-skilled labour force is a growth factor, emphasized directly or indirectly also by Smith (1776), Reich (1991), Krugman *et al.* (1999), Porter (2000), Florida (2002), Hathaway *et al.* (2012), Price (2012), Piparinen *et al.* (2014). Some remarkable milestones are fixed by Reich’s (1991), “knowledge workers”, followed by the Florida’s (2002) “creative class” / “creative professionals”. Recently Moretti (2012) identified the special spatial agglomerations named “*brain hubs*” or “*innovation clusters*”. Regardless their name - all structures represents the new engine for growth and generate the new and also prosperity for their communities.

The knowledge economy is present through the smart/intelligent systems revolution (Schwab and Samans, WEFa, 2016, p.v) at the global level. One important reason for the adoption of new / improved technologies resulted from R&D activity is increase the productivity Marin and Lotti (2015). The competitive advantage of Europe is supported by “a continuous stream of knowledge dividends resulting from the implementation of European sustainable technologies” (Gallehr *et al.*, 2009, p.84). The historical dichotomy between environmental problems and competitiveness is solved by greening the competitiveness through the adoption of the green innovation (Anderson, 2004). Eco-innovation (EcoAP- COM (2011) 899) works as a double positive externality instrument (Rennings, 1998). This particular process is described by R&D results transfer in the production chains through innovation and producing new and/or improved products competitive in global markets on one side coupled with the environment protection costs while the negative externalities are reduced on the whole (Rennings, 1998, p.9). This greening process increases the options, diversified technology (Rennings, 1998, p.9) destroying and creating new jobs, strongly differentiate by industry (OECD, 2012), improving the local resilience and global competitiveness of the firm, with impact on society and institutions also (Kadenbach, 2013).

The advantages of green development justify the acceleration of the internalization of negative externality through public policies (Rayment, 2009, p.8). Europe 2020 Strategy (COM/2010/2020 final) is based on the

“synergy between innovation policy and environment policy” (Kemp, 2011). The main implementation tool is the Innovation Union initiative (COM (2010) 546). The transition to a green economy at European level, a common European value, aims at achieving an integrated industrial policy based on sustainability-based competitiveness. The roadmap “A resource efficient Europe” (COM, 2011, 21) and “Industrial Policy for a Globalized Era” (COM, 2010, 614) are built on the Eco-Innovation Action Plan (COM, 2011, 899).

The transition towards knowledge economy is visible also in developing countries, as a new law of economics announced by Drucker since 2001 in both dimensions of globalization and protectionism.

Capello and Giovanni (2013) pointed that Eastern regions of Europe have moved from an exogenously driven phenomenon, mostly based on FDI attractiveness, to a more endogenous pattern of growth, led by local, intangible structural assets, like (formal and informal) knowledge.

Following the crises, recovery starts but with “fragile growth and structural weaknesses” (COM, 2016, 812 final). Cohesion policy in Europe failed while at the national level is “more rising inequality”, evidences identified by Dauderstädt and Keltek (2016).

Differences in development are explained in Evolutionary Economic Geography literature in relation to the degree of “novelty” to the region. *The knowledge distribution in space* is heterogeneous and shapes the heterogeneous production space distribution. Ladias *et al.* (2011) raise the importance of this functioning profile of economy which is calling into question the administrative NUTS classification only by static criteria's, while the dynamic spatial factors are ignored. Ladias *et al.* (2011) considers that better demarcation of macro-regions will be made if it will be taken into consideration the “betweenness centrality of places, ‘denser’ networks of flows among places or more ‘central’ places can be differentiated from others”.

The active labour force by level of education is heterogeneous spatially distributed, the high skilled agglomeration explaining the differences in development according to Morretti (2012) and Dijkstra and Athanasoglou (2015), increasing the potential to access to intelligent wave / generation of technologies and prepare the IVth Industrial Wave (WEF b, 2016).

While the high added value is produced in knowledge processes means that another significant change is made in the work content expressed by new skills demand (WEF a, 2016) and the emerging of the new forms of employment, out from the standard definitions (OECD, 2017, p.18). ILO make large debates and finds that the content of work is changing: *learning is work* (ILO, 2013a; ICLS-Resolution-I, 2013). Moreover, there are huge transformations of the large context of work like the increasing underutilization of labour (WEF a, 2016), ageing population and

deficit of specialised skills. For the workers next to the risks of exclusion from technology there are associated also the risks of “low pay, precariousness and poor working conditions” (OECD, 2017, p.3).

“Employment Protection Legislation (EPL)”¹ as a labour market institution (next to minimum wages, health and safety regulation) has a major role in exploiting the opportunities offered by technological change and globalization. The legal framework has to adjust the workforce “to changing demand conditions and technology” (OECD, 2017, p.18), assuring an efficient and effective allocation and reallocation of labour force across sectors and occupations. In the knowledge economy the legal framework is called to a new role: to provide minimum employment protection for all workers, as well as for workers in new forms of employment, but guaranteeing a new work organising favourable to innovation development. The increase in productivity and growth requests an appropriate worker-firm matching, where the firm is defined by its technology wave (WEF b, 2016).

On the background of the 2008 crises at EU level the EPL (working time, wage setting) adjustments became more frequent, while reforms reducing the labour taxation or raising entitlements became less frequent in light of tightening budget constraints (Turrini *et al.*, 2015, p.27).

2. Data and methodologies

2.1 Romania’s EPL Profile

EPL regime is complete (in countries: Afghanistan, Armenia, Georgia, Malaysia, Republic of Moldova, Montenegro, Romania) (Aleksynska, 2016).

Romania’s level of EPL index increase from 2.8 in 2004 (Romih and Festić (2008) citing Rukoswki (2003); Mitcevska (2003) and Anspal and Vork (2007)) to 3 in 2007 (Serban (2012), citing Fialova and Schneider (2011)). According to Cazes *et al.* (2012) during 2010/2011 compared to 2007/2008 period the EPL index decreased with 0.6 at 2.4, indicating a high flexibilization of labour market coupled with a decrease in labour protection. LABREF² presents for Romania during 2008-2014 period the tendency of increasing the procedural

1 Employment Protection Legislation EPL consists of “rules and procedures related to the faculty of companies to dismiss workers. It deals with the lawfulness of probationary periods, mandated notice periods and severance payments (payments to workers for early contract termination), procedural requirements to be followed in the case of individual dismissals or collective redundancies, sanctions for unfair dismissal, and conditions for using temporary or fixed-term contracts” (European Commission, 2016).

2 LABREF include “the job protection legislation” among its nine broad policy areas [next to labour taxation, unemployment benefits, other welfare-related benefits, active labour market policies, disability and early retirement schemes, wage bargaining, working time organization, immigration and mobility (www.oecd.org/employment/protection/)].

requirements with 5 measure that increase EPL and other 7 that decrease it, covering 6 policies fields from the 9 of EPL. First policy field is the “*Procedural requirements*” - EPL1 with 5 measures: -2 to decrease EPL and 3 to increase EPL, followed by “*Collective dismissals*” - EPL10 with 4 measures (-1; 3) and “*Temporary contracts*” - EPL9 with 3 measures (-1;2). There are also considered other 3 policy field with lower importance for Romania reflected by 2 measures in average (-1:1): *Maximum duration of fixed-term contracts* - EPL6, *Temporary agency work* - EPL7 and *Definition of valid reasons for fixed-term contracts* - EPL8 (-1; 1).

At this moment we do not identify any procedure destined to skills adjustment to the need for the technological demands of the employer's firm need.

2.2 Romania's Eco-Innovation performance and its need to green competence

Romania ranks 18th in the 2014 Eco-Innovation Scoreboard of the EU 28 (Roman, 2015; Dutta *et al.*, 2015), advancing 3 positions over the previous year. Analysis of the eco-innovation performance in a European context indicates a high degree of use of materials, water and energy resources, *but with low productivity*. The energy field is the most advanced - the improvement of energy efficiency being recognized as a political priority assumed by the government. The development of the circular economy in Romania is underdeveloped. There are highlighted as priority sectors requiring investment in capital (financial, human and technological): waste management and pollution, integrated waste management, increased recycling rates (especially in municipal and industrial sectors), waste processing (over 95% from Romania are deposited / landfill), the implementation of resource efficiency measures, etc. The new smart measures adopted are based on “designing sustainable products, using Open sources for the environment, new IT solutions” (Johnson, 2016). In the sense of Johnson, open source is based on sharing without restrictions of the knowledge and inventions, allowing to very large teams (communities and even cities) to find adequate solution in the fast way possible. The solutions results from an open design and production processes. Blue print are protected by Open Hardware (GNU GPL, MIT License, etc.) and Creative Commons while the fabrication processes are protected by other specific open hardware licenses (TAPR OHL, CERN OHL) The new paradigm that open sources brings is based on priority of the impact over the profit, anchored profoundly in the sustainability as the guiding value. In Romania the open source solution are not adopted, actions for eco-innovation promoting are only reactive driven at the environmental legislation. Romania's overall performance in the effectiveness of innovation policies for development reflected by the 2015 Global Innovation Index is still

below potential. Romania ranks 54/144 with the weakest performance in the sophistication of markets ranked 81/144, the second weakest is in Capital and Research, occupying position 73/144.

Investing in human capital must become a priority, reflected by weaknesses illustrated by high ranks (indicating low performance) in fields included in the inputs for innovation (human resources and research and the degree of sophistication of markets) such as Education 88/144, Knowledge Workers 81/144, Innovation Links 81/144.

Romania has a low potential for the launch of the New Industrial Revolution as a driver of economic growth because the greening of industrial policy seems to be still in its initial phase. The Romanian economy, characterized by Török *et al.* (2013, p.27) has a high degree of specialization in labour intensive industries (fibres preparation and spinning, wood cutting, clothing and accessories), capital-based (cement) and market-driven industries (footwear). Low and medium-tech sectors with low demand for knowledge and underdeveloped culture of innovation and a low level of innovation prevail (Török *et al.*, 2013, p.27). Romania is still a modest innovator, with an economy driven by transition efficiency towards the stage of innovation-led development. According to Global Competitiveness Index of the World Economic Forum in 2016, Romania occupies 53/140, with a score of 4.32/7 for 2015, comparable to the 2014 level.

In view to identifying the need for labour allocation, reallocation among occupations and sectors of economic activity we shall calculate for Romania the gap in eco-innovation and in labour productivity with the best performers (in terms of Eco-innovation), looking also at the labour productivity. Both dimensions of productivity reflect indirectly a capital, skill and technology input, assuring a production (GAV expressed in gross value added) and Green Gases Emissions.

Some states (stats.govt.nz, 2016) uses complex indicators like the Intensity of Greenhouse Gases (IGG) which measures the relationship between the environment and economy by comparing two indicators. According to OECD toolkit (oecd.org, 2017) IGG is a measure of Carbon productivity while it “will decrease enough so that the facility’s total GHG emissions will also decrease – even with increases in production”. The processes of improving energy efficiency, conservation and the use of lower-carbon energy sources is a knowledge intensive one and for us is a measure of Eco-innovation.

Johnson (2016) points that the sustainability requests the priority of the impact over the profit. This desiderate could be operationalised through increasing next to labour productivity also the impact over environment, respectively decreasing the green gases emissions. The best way to increase both the employment and the added value is to adopt appropriate innovation. In the sustainability paradigm the innovation which diminish the impact over

environment is eco-innovation. The best performers are those able to assure the quality dimensions in both eco-innovation and labour productivity performance, during entire process, both in input and output.

In view to profile the Romania's relative distance in Eco-Innovation performance compared with the EU average and with the best eco-innovation performers (here UK second performer but with accessible data), we use the carbon productivity indicator. In view to identify the need for new competencies addition we use the labour productivity indicator. For each reference we illustrate these profiles in Figures 1, 2 and 3.

One output efficiency measure of the production process is reflected by carbon productivity. One international "standard "measure" of pollution results in the economic activity is the Intensity of Greenhouse Gases (IGG). According to stats.govt.nz (2016) "Greenhouse gas emissions include carbon dioxide, methane, nitrous oxide, sulphur hexafluoride, hydrofluorocarbons, and perfluorocarbons. Each of these gases are converted into carbon dioxide equivalents". In the Eurostat methodology IGG (with Eurostat code ([env_ac_aeint_r2]) counts the carbon productivity but only for carbon dioxide, methane, nitrous oxide, by each sector of activity at 2 digits NACE Rev. 2 activity. IGG has as unit measure the Value added, gross, UNIT Kilograms per euro, chain linked volumes (2010).

One input efficiency measure of the production process is reflected by labour productivity (W_s) calculate as the ratio from production (Y_s) to labour (L_s) (1):

$$W_s = Y_s / L_s, \text{ labour productivity} \quad (1)$$

where s – economic activity sector by NACE Rev. 2 activity codes at 2 digits, Eurostat (Annex)

The best detailed indicator provided by Eurostat (with the code [nama_10_a64_e]) for production by economic activity is Gross Value Added (Y_s), which accounts aggregates by industry up to 64 sector of economic activity (NACE). Y_s has as unit measure the chain linked volumes (2010), million euro.

Equivalent in the same economic structure we select from Eurostat (with the code [nama_10_a64_e]) the total employment (L_s) as domestic concept. L_s has as unit measure Thousand persons.

Using the IGG and W we calculate the carbon and labour productivity gap through the following ratios:

Ratio $rIGG_{Ro}/UK_s$ is a measure for the Eco-Innovation productivity gap of Romania to the best performers in terms of Eco-Innovation, UK (second rank in the Eco-Innovation Scoreboard, below Switzerland – no full data provided by Eurostat): Ratios of IGG Air emissions accounts by NACE Rev. 2 activity for Greenhouse Gases (CO_2 , N_2O in CO_2 equivalent, CH_4 in CO_2 equivalent) for Romania compared to the UK:

$$rIGG_Ro_s/UK_s=IGG_Ro_s/IGG_UK_s \quad (2)$$

Ratio $rIGG_Ro_s/EU28_s$ is a measure for the Eco-Innovation productivity gap of Romania to the EU28 average: Ratios of IGG Air emissions accounts by NACE Rev. 2 activity for Greenhouse Gases (CO₂, N₂O in CO₂ equivalent, CH₄ in CO₂ equivalent) for Romania compared to EU28:

$$rIGG_Ro_s/EU28_s=IGG_Ro_s/IGG_EU28_s \quad (3)$$

Ratio rw_EU28s/Ros is a measure of the labour productivity gap of Romania to the best performers in terms of Eco-Innovation UK: productivity ratios Romania to UK relative (see Figure 2):

$$rw_EU28_s/Ro_s = W_EU28_s/W_Ro_s \quad (4)$$

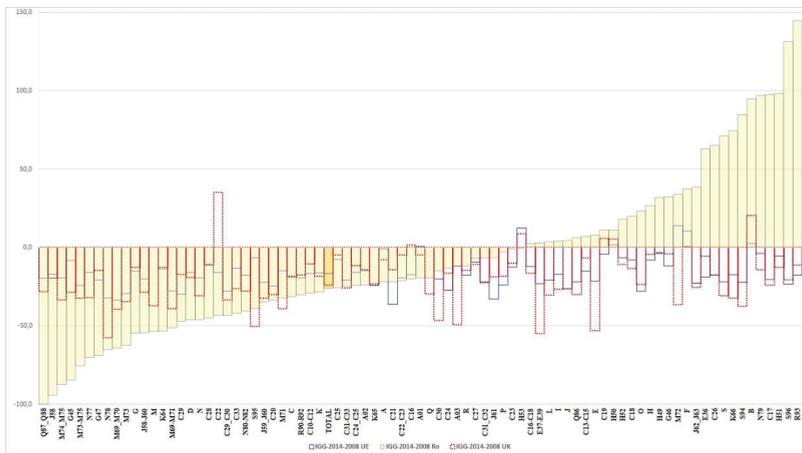
Ratio rw_UK/Ro_s is a measure of the labour productivity gap of Romania to EU28 average: productivity ratios Romania to UE28 relative (see Figure 2):

$$rw_UK/Ro_s = W_UK/W_Ro_s \quad (5)$$

Percent change $IGGcs_{t1-t2}$ is a quantitative measure of improvement of carbon productivity during t1-t2 period, in the country *c*, by sector *s* (see Figure 1).

$$IGGcs_{t1-t2}=(IGG_cs_{t2} - IGG_cs_{t1})/IGG_cs_{t1} *100 \quad (6)$$

Figure 1. Change of the rate growth of air emissions intensities by NACE Rev. 2 activity during 2008-2014, in Romania compared with EU28 and UK [%]



Source: Eurostat [env_ac_aeint_r2] - Greenhouse gases (CO₂, N₂O in CO₂ equivalent, CH₄ in CO₂ equivalent), graphic made by authors.

2.3 Romania's agglomeration tendency of high skilled workers at NACE Rev.2 at 2 digits at NUTS 5 level

In order to identify the functional “brain hubs” or “innovation clusters” in the sense of Moretti (2012) locations relevant for the focusing in labour allocation, reallocation among occupations and sectors of economic activity we shall calculate for Romania clustering tendency by the number of employees with tertiary level of education by ISIC Rev. 4/ NACE Rev 2 sectors at 2 digits. The sectors where the high skilled persons tend to cluster in HH locations are ranked by Moran's I z-value, detailed for pseudo significant $p < 0.05$ Moran I index 999 permutations, having the theoretical mean $E[I] = -0.0003$, and counted by the number of HH locations (see Figure 3).

The lattice model is the spatial perspective of data “wherein a location interacts with a given set of neighbours” (Anselin, 1998, p.120). In our model the location is manipulated as administrative data considering that:

- *Administrative and geographical data* – area data it is also the statistical unit LAU2 /NUTS 5 level (and not the persons or households) (Anselin, 1998, p.119). Location variables LAU2 local administrative units counting 3189 units, with polygons provided by ESRI Romania (Environmental Systems Research Institute), shape polygons that reflect territorial description of LAU2 are regulated according to Law 351/6 the July 2001 regarding the National Territory Arrangement Plan -spatially geocoded using the polygons areas using Arc GIS Software. The territorial administrative units LAU2 level are represented in SIRUTA (Romania's National Institute of Statistic (INS) – The National Interest Nomenclature Server – SENIN, Methodology SIRUTA – General Presentation) code by municipality, town, commune and County residence and are equivalent to NUTS5 (Nomenclature of Territorial Units for Statistics) level;

For each location there are presented the aggregated data of the socio-economic characteristic analysed, variable named as attribute data, representing:

- *Attribute data:* employees with tertiary level of education from the sector ISIC Rev. 4/ NACE Rev 2 sectors at 2 digits, micro data from 2011 National Census provided by contract by INS Romania.

The attribute being analysed is randomly distributed among the features in the study area; or the spatial processes promoting the observed pattern of values is random chance.

Queen contiguity spatial weight rule for weighting of 1st order by SIRUTA for a number of permutation = 999, p value 0.05 with a 90% confidence level.

Under the Null Hypothesis NH: complete spatial randomness (CSR). We accept hypothesis if $z < 1.65$ then accept NH and there is a complete spatial randomness (CSR) and reject hypothesis if $z > 1.65$, then reject NH - clustering tendency, mean < theoretical mean.

1. *Neighbourhood analysis / contiguity and spatial weighting technique* used as found by Anselin, (1998, 2002). Spatial relation conceptualization spatial LAG modelling is based on Queen Contiguity, first order type. For 2014, among the 3189 LAU2 (provided by ESRI) with data there is 807 location with 5 neighbours, 799 locations with 6 neighbours, 577 locations with 7 neighbours, 408 with 4 neighbours and 282 with 8 neighbours, summing a cumulative percent of 90.1%. The maximum number of neighbours is 16 in one location and minimum 1 in 4 locations;
2. *Analysis of global and local spatial autocorrelation* is realised through the Moran's I and Local Indicators of Spatial Association [LISA] (Anselin, 2003, p.99) (see Figure 3).
3. *The functional "brain hubs" or "innovation clusters" identified by selection of LAU2 units included in HH clusters types* following Anselin (1995, 1996, 2017a, 2017b, 2017c) (see Figures 4, 5 and 6) 1. LISA's clusters HH, In this model there are 5 types of spatial autocorrelation: High-High (H-H), Low-Low (LL) called spatial clusters registering positive spatial autocorrelation with agglomeration tendency (local Moran $I > 0$), HL and LH called spatial outliers registering negative spatial autocorrelation or dispersion tendency and NS locations - not significant spatial autocorrelation.

The spatial analysis Romania's agglomeration tendency of high skilled workers at NACE Rev.2 at 2 digits at NUTS 5 level is synthetically presented in Figure 3. The locations are split in two categories with and without clustering tendency. As we mention before, higher the z value (the Moran's I z-value calculated with Univariate Local Moran's, from GeoDa 1.10.0.8) higher is the clustering tendency. For each of the 88 sectors is measured next the clustering tendency also the spatial covering through the second dimension illustrated the Number of High-High (No HH) locations from clusters identified by number of employees with tertiary level of education detained.

3. Results and discussions

Fewer emissions produced per unit of real GAV (gross added value) indicates a quantitative measure of improvement of carbon productivity (see Figure 1). Change of the rate growth of air emissions intensities by NACE Rev. 2 activity during 2008-2014, in Romania compared with EU 28 and UK [%] (Figure 1)

indicates a divergent pattern for carbon productivity in Romania compared to UK and EU28. In Romania for one third from all sectors during 2008-2014 is increasing the air emissions intensity compared to UK and EU 28 average that indicates an almost universal tendency of decreasing this indicator. The structural economic change in Romania towards the green economy is strongly heterogeneous in both terms: sectoral and spatial, while in UK and EU 28 average this tendency is homogenous across all sectors.

The carbon and labour productivity gap are presented for from 81 total items studied in Figure 2. The ratio of air emissions intensities by NACE Rev. 2 activity Romania to EU 28 and Romania to UK and ratios of (labour) productivity Romania to EU 28 and Romania to the UK in 2014 illustrates a high variability across economic activity sectors.

There are 21 sectors (almost 26% from all sectors) that presents in Romania both high labour and carbon productivity gaps, lower compared to UK and EU28 levels:

- *for over the 10 times* in (C21) Manufacture of basic pharmaceutical products and pharmaceutical preparations, (C20) Manufacture of chemicals and chemical products. These sectors are critical from these criteria perspective and need to be prioritised on the first place to be restructured;
- *between 5 times and 10 times* in (C25) Manufacture of fabricated metal products, except machinery and equipment, B Mining and quarrying, (B79) Travel agency, tour operator reservation service and related activities, (E) Water supply; sewerage, waste management and remediation activities;
- *between 4 times and 5 times* in (K65) Insurance, reinsurance and pension funding, except compulsory social security, (G46), Wholesale trade, except of motor vehicles and motorcycles, (J58-J60) Publishing, motion picture, video, television programme production; sound recording, programming and broadcasting activities, (K) Financial and insurance activities, (J58) Publishing activities, (E37-E39) Sewerage, waste management, remediation activities, (Q87-Q88) Residential care activities and social work activities without accommodation. In this subgroup the first 2 are the traditional ones (heavy industry and mining) followed by some services activities, having at its lower margin some services for environment economic activities type;
- *between 2.6 times (the minimum total average) and 4 times* in (G) Wholesale and retail trade; repair of motor vehicles and motorcycles, (G45) Wholesale and retail trade and repair of motor vehicles and motorcycles, (J59-J60) Motion picture, video, television programme

production; programming and broadcasting activities, (N78) Employment activities, (C26) Manufacture of computer, electronic and optical products, (K66) Activities auxiliary to financial services and insurance activities, (S96) Other personal service activities. In this groups services are mostly present with the manufacturing of the computer, etc. ;

- The *labour productivity gap* is higher than two times in Romania compared to EU 28 for 57 items of sectors and in Romania compared to UK for 53 (see Figure 2);
- The *carbon productivity gap* is higher than two times in Romania compared to EU28 for 42 items of sectors and in Romania compared to UK in (Figure 2).

In 2014 in Romania the labour and productivity gaps are heterogeneously distributed across the economy activity sectors in 2014. From 81 items (NACE 2 digits) studied, regardless the productivity type labour or carbon hierarchized by the minimum average gap productivity level (among the 4 ratios / item), there are: more than 53% activities economic sectors with productivity gap ratios higher than minim 1.1, from which 27% are with significant gaps higher than 1.1 and lower than 2.6. Very important gaps, higher than 2.6 times, are identified in 21 sectors, representing a share of 26% from total number of sectors.

The highest heterogeneity is visible in Manufacture sector with best performers sector as well as the worst performers in terms of labour and carbon productivity. Manufacture of motor vehicles, trailers, semi-trailers and of other transport equipment (C29-C30) is the only sector analysed full competitive with labour and carbon productivity performance better than EU 28 and UK references. (All four productivities gaps are below 1 ratio). (C21) Manufacture of basic pharmaceutical products and pharmaceutical preparations, (C20) Manufacture of chemicals and chemical products. The worst performers, where all four ratios are at least higher *for over the 10 times* in Romania comparative to EU28 and UK levels.

Almost all sectors needs increasing labour and carbon productivity improvement but more than a half needs to diminishes the gap in productivity while in ¼ there is a high priority to be restructured – presenting alarm signals.

The Anselin's Global spatial autocorrelation model confirm the tendency of clustering for the highly skilled workers in more than 4/5 sectors NACE Rev.2 from 88 studied, at two digits in HH location core clusters, identifiable by LISA maps by sectors. The observed values of Moran I index were converted into z values for interpretation (Anselin, 2005, p.135; Anselin, 2003, p.91).

81.8% sectors at NACE Rev.2 at 2 digits present high skilled workers with the global tendency of clustering /agglomeration at NUTS 5 level, from which:

- 73.9% reject NH *strong general clustering tendency* for 66 sectors from 88 sectors NACE Rev. 2 considered from micro data INS Census 2011 (Moran's $I z$ value >2 , $p < 0.05$ significant). In these cases there are covered a minimum 23 core locations HH and a maximum 132 HH core locations from the total of 3189 locations NUTS5 (Figure2). The highest clustering concentration tendency is registered in sectors Extraction of upper and lower coal Extraction of metallic ores;
- 8.0% reject NH *weak clustering tendency* for 6 sectors from 88 sectors NACE Rev. 2 considered from micro data INS Census 2011 ($1.65 < \text{Moran's } I z \text{ value} < 2$, $p < 0.05$ significant). These sectors are 4 from *Manufacturing* (Tanning and finishing of skins; manufacture of travel goods and leather goods, harness and footwear; preparation and dyeing of fur, Manufacture of computer and electronic and optical products, Other industrial activities, Repair, maintenance and installation of machinery and equipment), one from *Construction* (Civil engineering work) and one from *Arts, entertainment and recreation* (Artistic creation and interpretation activities)
- 18.2% sectors at NACE Rev.2 at 2 digits present high skilled workers *without the tendency of agglomeration* at NUTS 5 level, for these cases we accept NH complete spatial randomness (CSR) - no clustering tendency. These sectors are: 8 from *manufacturing* (Manufacture of textiles, Manufacture of wearing apparel, Manufacture of paper and paper products, Manufacture of rubber and plastic products Metallurgical industry, Metal and metal products, excluding machinery, equipment and installations, Manufacture of electrical equipment, Manufacture of other transport equipment) followed by Human health and social work activities with 4 items (Education Activities related to human health, Combined health care and social work services with accommodation and Social work activities without accommodation), *Electricity, gas, steam and air conditioning supply* (Production and supply of electric and thermal energy, gas, hot water and air conditioning, Water capture, treatment and distribution) with 2 items and with only one sector for *Agriculture and Activities auxiliary to financial services and insurance activities* (Activities auxiliary to financial intermediation, insurance and pension funding).

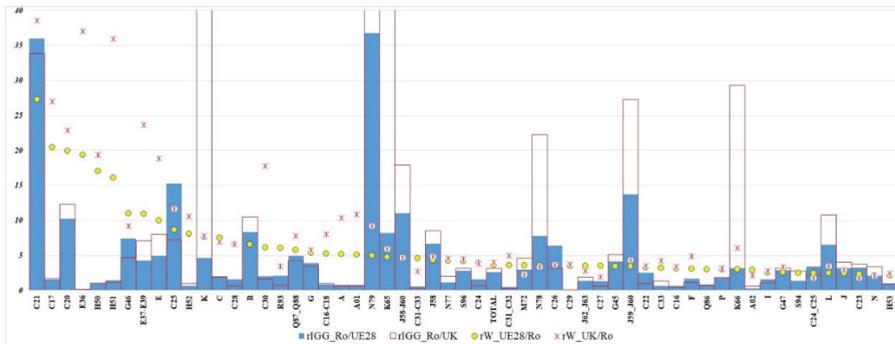
Choropleth map showing those locations with $p < 0.05$ significance level of Local Moran statistic for employees with a tertiary level of education from:

- Manufacture of basic pharmaceutical products and pharmaceutical preparations (Activity C21) (see Figure 4) first rank by labour and carbon productivity gap of Romania in a report to UK and EU 28 (see Figure 2).

In this case there are 12 functional “brain hubs” or “innovation clusters” covering 78 core locations HH from the total of 3189 locations NUTS5.

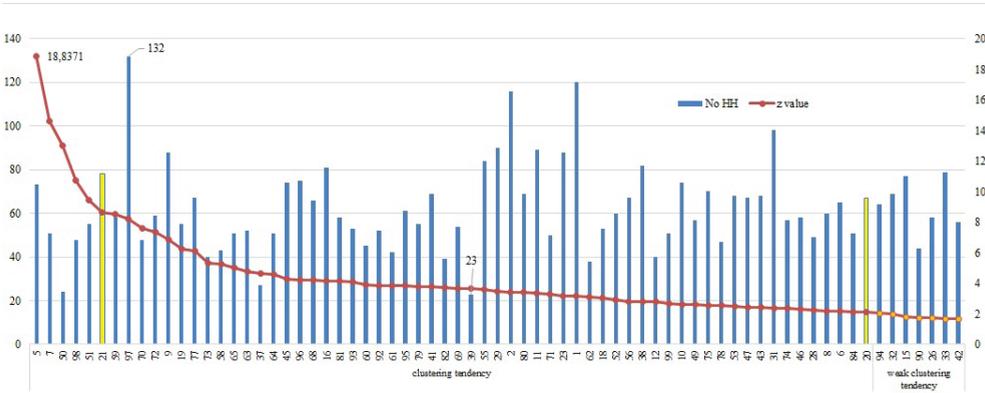
- Manufacture of paper and paper products (Activity C17) (see Figure 5) second rank by labour and carbon productivity gap of Romania in report to UK and EU 28 (see Figure 2) in this case there is no clustering tendency;
- Manufacture of chemicals and chemical products (Activity C20) (see Figure 6) third rank by labour and carbon productivity gap of Romania in a report to UK and EU 28 (Figure 2). In this case there are 18 functional “brain hubs” or “innovation clusters” covering 67 core locations HH from the total of 3189 locations NUTS5.

Figure 2. The ratio of air emissions intensities by NACE Rev. 2 activity Romania to EU28 and Romania to UK and ratios of (Labour) productivity Romania to EU 28 and Romania to UK in 2014



Source: Eurostat [env_ac_aeint_r2]) - IGG: Greenhouse Gases (CO₂, N₂O in CO₂ equivalent, CH₄ in CO₂ equivalent) [nama_10_a64] Y: Gross Value Added - Chain linked, graphic made by authors volumes (2010), million euro, [nama_10_a64_e] L: Total employment domestic concept, Where W=Y/L, rIGG_Ro/UE28=IGG_Ro/IGG_UE28, rIGG_Ro/UK=IGG_Ro/IGG_UK, graphic made by authors.

Figure 3. The hierarchy of ISIC Rev. 4/ NACE Rev 2 sectors at 2 digits by clustering tendency by the number of employees with tertiary level of education from the sector, ranked by Moran's I z-value in Romania in 2011



Source: calculus made by authors using microdata from 2011 National Census provided by contract by INS Romania.

No HH - Number of High High locations from clusters identified by number of employees with tertiary level of education detained in the NACE sector at 2 digits.

z value - the Moran's I z-value calculated with Univariate Local Moran's I in GeoDa 1.10.0.8. Rook contiguity rule for weighting of 1 st order by SIRUTA.

Figure 4. Choropleth map showing those locations with a $p < 0.05$ significance level of Local Moran statistic for employees with tertiary level of education from Manufacture of basic pharmaceutical products and pharmaceutical preparations Activity C21

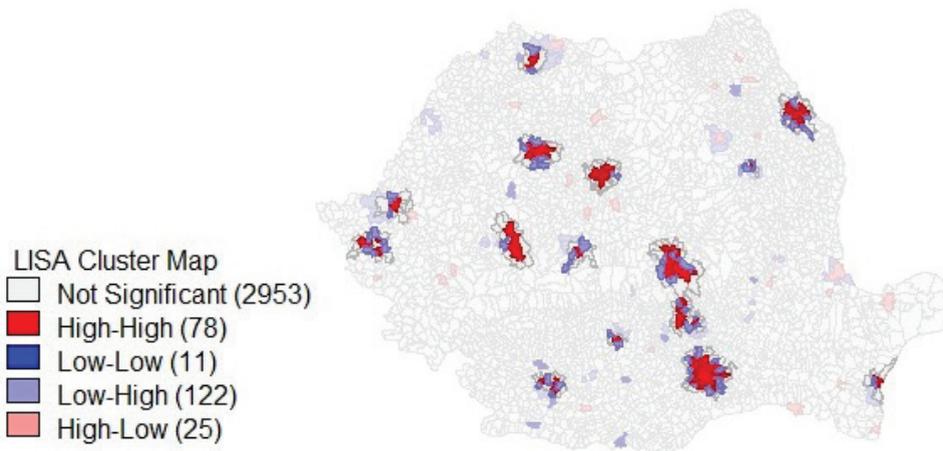


Figure 5. Choropleth map showing those locations with a $p < 0.05$ significance level of Local Moran statistic for employees with tertiary level of education from Manufacture of paper and paper products Activity C17

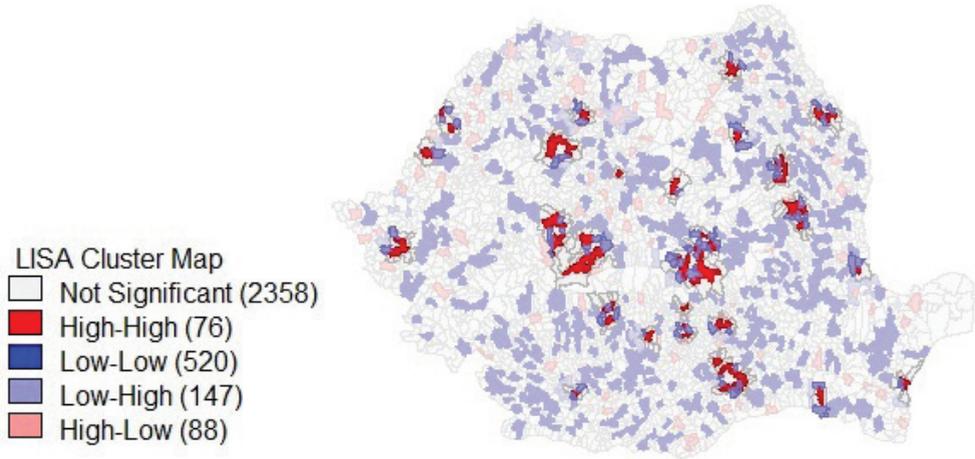
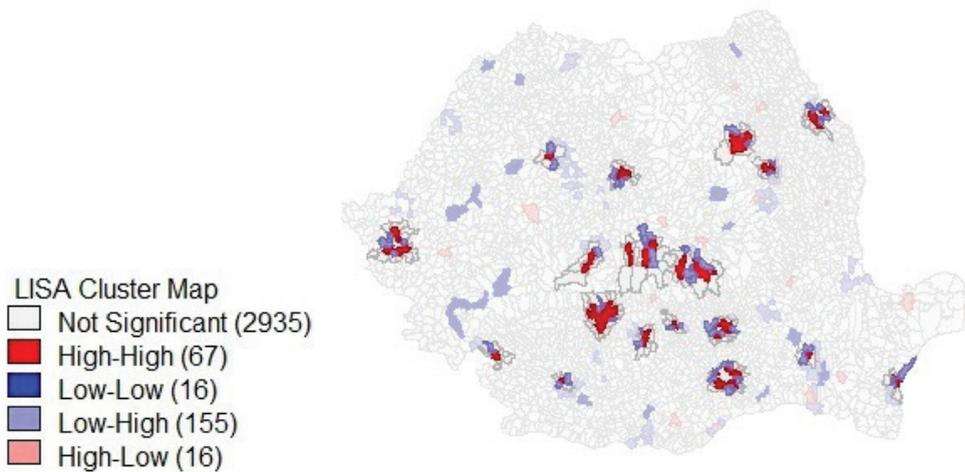


Figure 6. Choropleth map showing those locations with a $p < 0.05$ significance level of Local Moran statistic for employees with tertiary level of education from Manufacture of chemicals and chemical products Activity C20



Note: Figure 4, 5 and 6 are details from Figure 2. Esri.ro Shapefiles, GeoDa 1.10.0.8. Maps made by authors.

4. Final remarks

Almost all sectors in Romania needs to increase both labour and carbon productivity. Among sectors more than a half needs to diminish the significant gap in productivity while more than ¼ requests with high priority to be restructured – presenting clear alarm signals. These prioritised sectors requests serious capital investments in new eco-innovative technologies coupled with new skills acquisition. If the new skills acquisition supports the jobs adjustment with the new technologies (Productivity Commission 2016, Australian Government, p.84) the EPL mechanism supports the jobs adjustments with workers, human capital holders. Our main contribution is made under the NEG perspective, in conditions of over 70% of sectors have spatial agglomeration tendency of the high human capital, and then EPL the employment labour legislation need to be tuned accordingly. The conclusion of the article is that accelerating eco-innovation implementation by sectors in a “personalised” manner according to location and sectors characteristics needs that EPL to work smart.

The gap in carbon and labour productivity is heterogeneous across sectors but with a high probability of clustering tendency at NUTS5 level for the highly skilled workers. This main conclusion supports our intuition that Job Protection's sectoral and local adjustments needs to act as an instrument in view to accelerating eco-innovation implementation.

Our interdisciplinary approach offers a tool /a diagnosis methodology for improving development decisions, looking at the intersection between space and sector/industry, with the influence in:

- Selection and adoption of technologies based on eco-innovation in a rapid pace, according to the firm's needs without stifling innovation processes;
- Identification of skills demand jobs focused on tertiary education level, because this reflects the capacity of human capital to create, improve and use technologies (Moretti's Hypothesis). High-skilled staff is the engine, the growth engine by demanding new and eco-friendly technology, and creates a category that provides the highest probability of positive externalities, including the creation of new high-quality jobs, including for workers with medium and low education level;
- It provides valuable input for the continuity of the curriculum content in regard to technological evolution and implicitly to better harmonise the education with the labour market demand;
- This result gives a hint regarding the position of the sector's contribution on the global chains of production, through the level of the two considered productivities: labour and equivalent carbon;

- Is the best quantitative and qualitative profile of high skilled workers by sector and by location at the lowest administrative level (NUTS5), identifying the functional “brain hubs” or “innovation clusters”, knowledge structures more efficient to become the subject of public policies;
- Improving in general the within and between sectors and within and between occupation allocation and reallocation of the labour force, in a flexy-secure manner, offering to all workers the minimum job protection and minimising the risks (technological exclusion, risks of low pay, precariousness and poor working conditions, etc.).

The last and not least, in the policy of development there is the need to update and improve the EPL in concordance with these new realities. Our hypothesis is that high skilled human capital is the generator of positive externalities in special the new knowledge, new technologies and new jobs creation, etc. In consequence, we appreciate that EPL has an integrator character that exceeds the adjustment for efficient and sustainable allocation and reallocation of the labour force. Adding the sectoral and local dimension in a globalised economy, EPL could be a growth factor and not a barrier through its high inertias.

The rethinking of EPL is imperious required by three main aspects:

- The expansion of the work content in the ILO’s perspective that learning is work;
- EPL’s highly integrator character for many policies, not only the “traditional” ones of labour market;
- EPL needs to be seen as a smart mechanism that conducts simultaneous harmonisation of many policies at different levels local and sectorial.

Large future debates could better shape the new profile of EPL, our work is only a pointer to that priority.

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NACE Rev. 2 activity codes, Eurostat

[env_ac_ainah_r2], [nama_10_a64_e], [nama_10_a64]

A	Agriculture, forestry and fishing
A01	Crop and animal production, hunting and related service activities
A02	Forestry and logging
A03	Fishing and aquaculture
B	Mining and quarrying
C	Manufacturing
C10-C12	Manufacture of food products; beverages and tobacco products
C13-C15	Manufacture of textiles, wearing apparel, leather and related products
C16-C18	Manufacture of wood, paper, printing and reproduction
C16	Manufacture of wood and of products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials
C17	Manufacture of paper and paper products
C18	Printing and reproduction of recorded media
C19	Manufacture of coke and refined petroleum products
C20	Manufacture of chemicals and chemical products
C21	Manufacture of basic pharmaceutical products and pharmaceutical preparations
C22_C23	Manufacture of rubber and plastic products and other non-metallic mineral products
C22	Manufacture of rubber and plastic products
C23	Manufacture of other non-metallic mineral products
C24_C25	Manufacture of basic metals and fabricated metal products, except machinery and equipment
C24	Manufacture of basic metals
C25	Manufacture of fabricated metal products, except machinery and equipment
C26	Manufacture of computer, electronic and optical products
C27	Manufacture of electrical equipment
C28	Manufacture of machinery and equipment n.e.c.
C29_C30	Manufacture of motor vehicles, trailers, semi-trailers and of other transport equipment
C29	Manufacture of motor vehicles, trailers and semi-trailers
C30	Manufacture of other transport equipment
C31-C33	Manufacture of furniture; jewellery, musical instruments, toys; repair and installation of machinery and equipment
C31_C32	Manufacture of furniture; other manufacturing
C33	Repair and installation of machinery and equipment
D	Electricity, gas, steam and air conditioning supply

E	Water supply; sewerage, waste management and remediation activities
E36	Water collection, treatment and supply
E37-E39	Sewerage, waste management, remediation activities
F	Construction
G	Wholesale and retail trade; repair of motor vehicles and motorcycles
G45	Wholesale and retail trade and repair of motor vehicles and motorcycles
G46	Wholesale trade, except of motor vehicles and motorcycles
G47	Retail trade, except of motor vehicles and motorcycles
H	Transportation and storage
H49	Land transport and transport via pipelines
H50	Water transport
H51	Air transport
H52	Warehousing and support activities for transportation
H53	Postal and courier activities
I	Accommodation and food service activities
J	Information and communication
J58-J60	Publishing, motion picture, video, television programme production; sound recording, programming and broadcasting activities
J58	Publishing activities
J59_J60	Motion picture, video, television programme production; programming and broadcasting activities
J61	Telecommunications
J62_J63	Computer programming, consultancy, and information service activities
K	Financial and insurance activities
K64	Financial service activities, except insurance and pension funding
K65	Insurance, reinsurance and pension funding, except compulsory social security
K66	Activities auxiliary to financial services and insurance activities
L	Real estate activities
L68A	Imputed rents of owner-occupied dwellings
M	Professional, scientific and technical activities
M69-M71	Legal and accounting activities; activities of head offices; management consultancy activities; architectural and engineering activities; technical testing and analysis
M69_M70	Legal and accounting activities; activities of head offices; management consultancy activities
M71	Architectural and engineering activities; technical testing and analysis
M72	Scientific research and development
M73-M75	Advertising and market research; other professional, scientific and technical activities; veterinary activities
M73	Advertising and market research
M74_M75	Other professional, scientific and technical activities; veterinary activities

N	Administrative and support service activities
N77	Rental and leasing activities
N78	Employment activities
N79	Travel agency, tour operator reservation service and related activities
N80-N82	Security and investigation, service and landscape, office administrative and support activities
O	Public administration and defence; compulsory social security
P	Education
Q	Human health and social work activities
Q86	Human health activities
Q87_Q88	Residential care activities and social work activities without accommodation
R	Arts, entertainment and recreation
R90-R92	Creative, arts and entertainment activities; libraries, archives, museums and other cultural activities; gambling and betting activities
R93	Sports activities and amusement and recreation activities
S	Other service activities
S94	Activities of membership organisations
S95	Repair of computers and personal and household goods
S96	Other personal service activities
T	Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use
U	Activities of extraterritorial organisations and bodies

THE THREE LEGGED SYSTEM OF ORGANISATIONAL INTEGRITY

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Abstract: *Public organisation with mature integrity systems are resistant to the misconduct of their own employees, such as corruption and other misuses of public property. This article argues that legality, legitimacy and legacy are the three legs of a solid system of organisational integrity. Legality since compliance with the legal rules is the precondition of integrity. Organisations moving from legality to legitimacy build their inner regulations on the values and basic principle of the laws and not on their specific provisions only. Organisations with integrity try to leave legacy to their successors, valuable fortune to the future generation, they try to fulfil their mission and help their employees to realize their vocation. The endeavour to go beyond legality to legitimacy and create legacy helps organisations to exceed the level of compliance and reach the level of integrity.*

Key words: *management control; corruption prevention; integrity*

JEL Classification: *H830; K4; K420*

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Corruption is a serious problem in each of the Central and Eastern European countries. Therefore these countries have to find effective tools for fighting against corruption. The traditional way for doing so is the reinforcement of the authorities responsible for the fight. It covers several measures, e.g. capacity building of the police departments and prosecutor offices, tightening the punishment of corruption offences and increasing the penalties of corruption related crimes. One of the outstanding example of this approach was the establishment of the National Anticorruption Prosecutor's Office in Romania in 2001.

Another approach tries to prevent corruption by encouraging integrity at all level of the society. This approach was followed by the State Audit Office of Hungary (SAO) when it launched its Integrity Project in 2009. 'Mapping Corruption Risks – Promotion of an Integrity-Based Culture of Public Administration' was the title of the project.

The aim of the article is to describe the theoretical background of a sound integrity management system which is an effective tool of corruption prevention. The first chapter of the article compares the traditional and the integrity-oriented approach of the fight against corruption, highlighting the advantages of the integrity approach. The second chapter briefly expounds Ouchi's famous theory on the three types of controls, arguing that clan-control is the antecedent of the integrity-oriented control. The third chapter explicate the mechanism by which organisational culture influences the behaviour of the members of the organisation. The fourth chapter explains the relationship between the culture of compliance and the culture of integrity. The fifth chapter argues that a sound integrity management system should be based on three basic principles: on legality, legitimacy and legacy.

1. Organisational integrity as a tool of preventing corruption

The word 'integrity' originates from the Latin expression *in-tangere*, which means "intact" or "untouched". In other words, the term designates someone or something unblemished, inviolate and beyond reproach; in addition, it alludes to virtue, incorruptibility and the condition of purity. According to another view the root of integrity is the Latin "integer" adjective, which means "whole" or "entire". The concept of integrity is used to describe both people and organisations.

The term "integrity" as a basic characteristic of an ethical personality has been used by the human sciences for ages. Integrity usually refers to a quality of a person's character, and any person said to be acting with integrity is usually being honest and trustworthy. Individuals with strong integrity do what they think is right regardless of the consequences attached to their decisions or is perhaps making a personal sacrifice for the greater good. Integrity is the opposite of lying,

deceiving others for personal gain. Integrity means doing the right thing at all times and in all circumstances, whether or not anyone is watching. It takes having the courage to do the right thing, no matter what the consequences will be.

Organisational integrity means that the operation of an organisation is in adherence to the rules applicable to it and to the values and principles defined by or for it. In the sense of organisational management, integrity means that an organisation has a positive, sound set of values that are in line with social expectations and it works in accordance with these values. The latter presupposes that the employees also identify themselves with the organisation's values and act accordingly. In this sense integrity is a synonym for correct (compliant, ethical) employee behaviour. Consequently, integrity is the exact opposite of incorrect employee behaviour, like fraud, corruption and any kind of abuse of official power.

This is the point where integrity and the fight against corruption come together since the higher level of integrity an organisation has, the more resistant it is to corruption. Consequently, the strengthening of an organisation's integrity is an important tool for preventing and mitigating risks of corruption.

Table 1 summarises the differences between the traditional approach to the fight against corruption – which is aimed at detecting specific cases of corruption by the reinforcement of the authorities – and the approach that focuses on organisational integrity.

The first important difference – reflected by the first two rows of Table 1 – is that the integrity-oriented approach is aimed at the detection of corruption risks and not the corruption itself, and tries to prevent corruption by the efficient management of the identified corruption risks.

The second important difference is reflected by the third and fourth rows of Table 1. They reveal a new theatre of the war against corruption, it is the organisation. The fight against corruption is shifted from the national level to the level of individual public organisations. This can improve the effectiveness of the fight significantly, since it is not only a single authority that combats a multitude of unknown perpetrators but thousands of public institutions take up the fight against corruption. In this approach, the leaders of the many thousands of public institutions are expected to develop a sound system of integrity controls in order to strengthen the organisations' resilience to corruption.

Reflected by the fifth row of Table 1 the integrity oriented approach has its own weapons for fighting against corruption. They are different from the weaponry of the traditional approach. Its armour contains the integrity controls. They are means of managing integrity risks, including policies, procedures, guidelines, practices or organizational structures, which can be of an administrative, technical, management, or legal nature.

Table 1. Main features of the traditional and the integrity-oriented approach to the fight against corruption

Features	Traditional approach	Integrity-oriented approach
Subject of the fight	Corruption itself	Risk of corruption
Purpose of the fight	Disclosure of corruption	Prevention of corruption
Scene of the fight	The entire country	The organisation
Main warriors of the fight	Public authorities	Leaders of the organisation
Armor of the fight	Legislation, investigation, retaliation	Integrity controls
Results of the fight	Disclosure of corruption, sanctions	Strengthening the organisation's ability to resist corruption

Source: Own representation after Pulay, 2014, p. 140.

The last row of Table 1 makes clear why integrity can be an effective safeguard against corruption. The traditional approach deals with individual cases and ties to disclosure corruption related crimes one by one. The integrity oriented approach tries to make the whole organisation resistant against many risks of corruption at all levels of the organisation. This article describes the ways and means by organisational integrity effectively defend the organisation against the threats of corruption.

2. From clan-control to the culture of integrity

The term clan-control was introduced by William G. Ouchi in his famous article "Markets, Bureaucracies and Clans" (Ouchi, 1980). Market, bureaucracy and clan are the three modes of controls distinguished by Ouchi. He argued that the market control – which is the basic control mechanisms in a market economy – often fails, due to the fact that the market transactions are too complex. They involve long-term obligations. Theoretically contingent claim contracts can deal with future obligations, but when future is either complex or uncertain or both then it is impossible to specify a contract which takes into consideration the future options completely. This failure of the market control cries for bureaucratic solutions when contractual solutions are replaced by rules.

Ouchi underlines two principal advantages of the bureautic control compared to the market control.

First, bureautic control is applied between the employer and the employees. In the employment relationship employees in exchange of receiving wages

accept the employer's right to direct their daily activities (within the frame of the employment contract), and closely monitor it. In the employment contract the duties of the employees and the rights of the employer are regulated incompletely, giving room for the employer to regulate the employees' activities according to circumstances raised after signing the contract. Thus the problem of dealing with future uncertainties is more or less solved.

The second principal advantage is even more important from the viewpoint of this article. Organisations can create trust among their members more easily than market can between the parties of a market transaction. Employees of an organisation assume some commonality of purpose, because they learn that their rewards are somehow depending on the performance of the organisation: in long-the long run good performance of the organisation yields for them also. In bureaucratic organisation technical expertise is an important element of the commonality. Bureaucracies appreciate professional standards and behaviour, and professionals meeting these standards are rewarded and promoted by the bureautic organisations. High levels of professionalism becomes a value shared by the members of the organisation and the organisation itself and creates a drive for excellence.

In spite of the advantages of the bureautic control compared to market control, it has its own boundaries. Bureautic control uses rules, but rules are relatively weak devices. Any specific problem needs a specific rule. The bureautic control of complex organisation or processes needs enormous number of rules without covering all possible contingencies. Therefore in a quickly changing environment bureautic control fails to respond properly to the changes.

The failure of both the market and the bureautic controls turned Ouchi's attention to a third mode of control. In the 1970s he noticed modern industrial organisations applying social mechanisms which reduced the differences between organisational and individual goals and created a strong sense of community. These organisations were operating typically in technologically advanced industries, where teamwork was common, technologies changed often and therefore individual performance was highly difficult to measure. These were the typical circumstances where both market and bureautic control fail. The social mechanism to these modern industrial organisations reminded Ouchi to the control mechanism of the preindustrial craft organisations where the members of the organisation previously served an apprenticeship during which they were socialized into accepting the objectives of the craft organisation. Based on this experience Ouchi discerned a third mode of control and called it clan-control. This name originates from Durkheim who referred a clan as the case of organic solidarity contrasted to the contractual relations (on which market and bureautic control are based). The solidarity steams from the necessary dependents upon one another which resulted in common goals and cooperation.

The feeling of community is the basis of informal organisations but essential to the smooth operation of every formal organisation as well. Common goals and the feeling of community are effective elements of any control mechanism aimed at meeting of organisational goals and avoiding behaviour destructing them.

Ouchi argued that clan-control could be effective in an environment where market control and bureautic control fail. Clan control relies upon creating goal congruence therefore it can work among complex circumstances where performance is excessively ambiguous.

Ouchi summarized two main characteristics of the three control modes in a table (see Table 2).

Normative requirements refer to the basic social agreements that all members of the transaction network must share in order to the efficient functioning of the network. Reciprocity is a normative requirement for all the three control modes. It reflects the mutual interest of the parties of the transaction which is the basic precondition of voluntary transactions. Legitimate authority is critical both for bureautic and clan-control. In the case of bureautic control it permits the employer to specify the work assignments of the employees and closely monitor their performance. In the case of clan-control legitimate authority is usually part of the tradition, and obedience to the leaders of the clan is strongly encouraged by the tradition.

Table 2. An organisational failures framework

Mode of control	Normative requirements	Informational requirements
<i>Market</i>	Reciprocity	Prices
<i>Bureaucracy</i>	Reciprocity Legitimate authority	Rules
<i>Clan</i>	Reciprocity Legitimate authority Common values and beliefs	Traditions

Source: Ouchi, 1980, p.137.

For market control price-information is needed. Ouchi underlines that very difficult to arrive at correct prices. Rules are relatively crude information devices. There are standards behind the rules but they indicate the value of an output approximately only. Employees perceive them as equitable only as long as they believe that they contain a reasonable amount of performance information. The compliance with rules does not reflect the value of the performance when tasks become unique, integrated or ambiguous for other reasons.

From the performance evaluation perspective tradition is the least precise information prerequisite, since they are formulated in a general way. On the other

hand, the set of traditions in a formal organisation may produce a unified, although implicit philosophy how that organisation should work. This philosophy is learnt by the employees of the organisation through a long learning (socialisation) process after which they can deduct from it a rule which compasses their appropriate decision-making in any specific cases. It means that long socialisation is a precondition of the efficiency of the clan-control.

Taking into consideration the many hindrances of meeting the informational requirements of the proper functioning of the three control modes, it is not surprising that Ouchi was pessimistic about the efficiency of the future control modes. He stated that the “degree of uncertainty and opportunism that characterize American society may be such that no mechanism of control ever function very well” (Ouchi, 1980, p.140). Since the publication of his article three and a half decades have past, during which management sciences developed a lot. They responded the challenges of creating more efficient control mechanisms. Multi-dimension performance management systems were introduced to control the performance of complex organisations as a further development of the market control relying on price-information only. Compliance systems were introduced as new and comprehensive forms of the bureaucratic control. The conscious building of organisational culture tried to replace the traditions prerequisites of the clan-control and creating a control system which is based on the feeling of community and the prevailing values shared by the leaders and the employees of the organisation. Each of the three developments are interesting and instructive. This article focuses on the third one and tries to present the development process leading from clan-control to a control system based on the culture of organisational integrity.

3. From clan-control to organisational culture

Traditions can be inherited only by organisations being operated for a long time. The number of organisations characterised by long tradition is limited. Does it mean that the relevance of the clan-control is limited also? Not necessarily. According to Ouchi the essence of clan-control is a unified, although implicit philosophy how that organisation should work, and after a long learning process employees can deduct from it a rule which compasses their appropriate decision-making in any specific cases. Ouchi emphasizes the importance of the long socialisation process during which employees understand traditions and collect experience on its usefulness. We have to raise the questions whether tradition is the only means for creating a unified organisational philosophy and socialisation is the only way for learning. Management science answered to these questions by definite “no”. It argued that top managers can develop an order of values and principles which may become prevailing rules through

the process of internalisation. It starts with learning what the norms are, and then understanding why they are of value or why they make sense, until finally they accept the norm as their own viewpoint. Internalised norms are said to be part of an individual's personality and may be exhibited by one's moral actions. Internalisation could be the result of socialisation but it could be speeded up by formal training and explicit education and the involvement of employees in the creation of organisation's value order and the related documents (e.g. mission statement, code of ethics).

The conscious creation of the organisational philosophy does not need organic relationship among the members of the organisation characteristic to the clan-control since the members of the organisation are formed into a community by the goals, values and principles shared by all of them. Therefore clan-control is replaced by something else, namely by organisational culture. What is an organisational culture?

Answering to this question we can start with the phenomenon that behaviour of the employees of an organisation is influenced by the organisation itself. Not the formal rules applied by the organisation effect employees' behaviour only, but the atmosphere, the relationship among the employees, the prevailing management style and many other informal elements of organisational life have an impact on employees' daily decision making. Sciences try to grasp this phenomenon by the notion of organisational culture. It is an abstract concept, and there are several definitions of it. We follow the concept of Edgar Schein. According to his definition organisational culture "is a pattern of basic assumptions that a given group has invented, or developed in learning to cope with the problems of external adaptation and internal integration, and that have worked well enough to be considered valid, and therefore to be taught to new members as the correct way to perceive, think and feel in relation to those problems" (Schein, 1984, p.3). Schein divided organizational culture into three different levels:

- artefacts and creations (symbols),
- (espoused) values,
- basic (underlying) assumptions.

(In brackets you can see the supplements to the original terms added by the author in his later publications.)

Artefacts and symbols mark the surface of the organization. They are the visible elements such as logos, architecture, structure, processes or even corporate clothing. They carry important, but sometimes not decipherable messages to the employees and to external parties also.

The second level concerns standards, values and rules of conduct, the way by which the organization express strategies, objectives and philosophies and made them public. Problems could arise when values publicized by the organisation

are not shared by the managers and employees of the organisation. Therefore Schein put the indicative “espoused” in front of the noun “value”. It that case values represent a greater level of awareness. They are apt to reasoning – in verbal explanation – the behaviour, but usually are not strong enough to really govern the specific decision making of the members of the organisation.

In order to really understand how culture does work we have to delve into the underlying assumptions level – emphasizes Schein – since they determine how group members perceive, think and feel. The mechanism of action is the following. Employees try to solve problems by acting in line with the espoused values of the organisation. If actions begin to solve the problem and success is repeated several times then the value is gradually transformed into an underlying assumption that problems could be solved by following the value. As the assumption is taken for granted they become powerful means for controlling behaviour, hence they are less debatable and confrontable than espoused values. Schein argues that as certain motivational and cognitive processes are repeated and continue to work, they become unconscious. Therefore the basic underlying assumptions are deeply embedded in the organizational culture and are experienced as self-evident and unconscious behaviour. Assumptions become patterned into “cultural paradigms”, which tie together the basic assumptions. The cultural paradigm is a set of interrelated assumptions that form a relatively coherent pattern. This pattern is the core of organisational culture which has a decisive role in shaping the behaviour of the employees of the organisation, therefore culture fulfils many control functions.

Table 3 summarizes the basic similarities and differences between clan-control and control exercised by creation and reinforcement of organisational culture.

Table 3. Comparison between clan-control and control exercised by organisational culture

Mode of control	Normative requirements	Informational requirements	Personal requirements
<i>Clan</i>	Reciprocity, Legitimate authority, Common values and beliefs	Traditions	Employees, who went through a long socialisation process
<i>Organisational culture</i>	Reciprocity, Legitimate authority, Espoused values and underlying assumptions	Cultural paradigm	Employees, who went through an internalisation process

Source: Own representation.

Clan-control and the control exercised by organisational culture are very similar to each other as it is reflected by Table 3. However there are two important differences as well. First, contrary to the traditions which are developed by natural processes, cultural paradigm can be created artificially also. Second, personal requirements of the clan control could be met by a long process of socialisation whilst internalisation is expected to be a shorter process. There are plenty of management manuals on how to create an organisational culture containing good advices for shortening of the internalisation process by formal training and many other means. This article does not want to challenge the suggested methods but would like to underline that the creation of culture needs a lot of time.

4. The culture of integrity

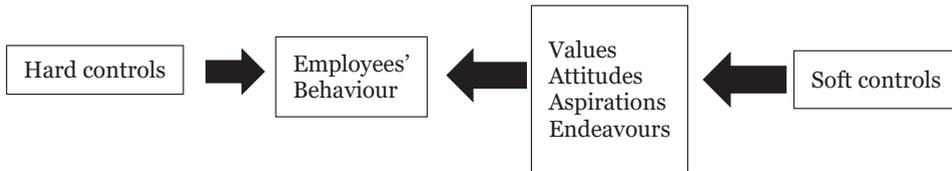
The reinvention of organisational culture has led to the development of different kinds of cultures. We can speak about the culture of quality, the culture of excellence, the culture of diversity and the culture of integrity. The distinctive sign of the different cultures are the prevailing values of the cultures: each culture is named after the value with the highest priority in the organisational culture. In the organisational culture of integrity the central value is integrity. It means that integrity is a decisive aspect of the character of the organisation and organisation behaves ethically even when this would not be in its own (short term) interest. An organisation can act through its members only, therefore each of the leaders and the employees of the organisation have to follow the ethical values of the organisation in their own decision making. Meeting of this requirement is a great challenge. There are two approaches to get members of the organisation act according to ethical values of the organisation. The first is the compliance approach, the second is integrity.

The compliance approach relies on rules. It uses formal and detailed rules and procedures, which try to regulate in every situation how to behave ethically. Typical instruments of this approach include legislation, strict behavioural codes, extensive control mechanisms and control institutions with extensive powers. They are the so called hard controls, applied for directly influence employees' behaviour.

The integrity approach relies on self-control exercised by each individual. Self-control mechanism consists of two components: moral judgment capacity and moral character. Moral judgment capacity can be strengthened by learning and understanding the values, and developing the skills in ethical decision making needed to apply those values in the daily practice. Ethical decisions making skills can be improved by ambitious code of ethics, workshops on ethical dilemmas, interactive trainings and several other means. Moral character is the instinctive

motivation of the person to act upon ethical values, and aptitude, fortitude and hardihood to act upon them resisting to tempting offers. Organisations pursuing integrity try to select employees with solid morality. Because of its instinctive nature moral character is very difficult but not impossible to change. Organisational culture might have a very important role in strengthening its members' moral character. Organisations creating a feeling of community, empowering and respecting their employees motivate them to voluntarily adopt organisation's values as their own. Values would be followed by the employees because they belong to a community which enhances their self-esteem. The respect increases self-respect. If you are respected by the community and by your leader for being competent, true, trustworthy and honest, then you try to be competent, true, trustworthy and honest. The special control devices for integrity management are the so called soft controls, aimed at influencing employees' motivation, loyalty, integrity, inspiration, standards and values. They influence employees' behaviour indirectly through their convictions and attitudes, as you can see in Figure 1.

Figure 1. The effect of hard and soft controls on employees' behaviour



Source: Own representation.

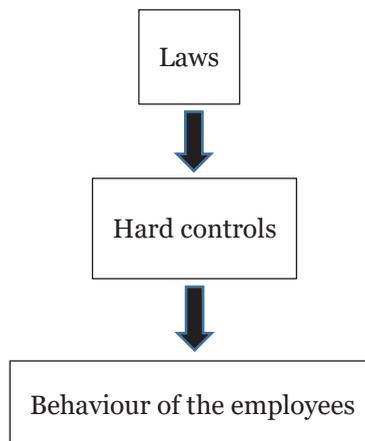
There are many reasons why one might behave ethically. For example, there might be a threat of punishment, or a promise of a reward, to keep one in line. But following one's self-interest in this way, even if it results in ethical behaviour, is not integrity. Integrity is an aspect of character that leads the person to develop deeply-held ethical commitments and to act on them consistently. People with integrity will, therefore, tend to behave ethically not only when it is in their own interest, narrowly construed, to do so, but also when it is not. Empirical studies (Tyler *et al.*, 2008) show that an organizational culture that encourages ethical conduct usually not emphasizing the fear for punishment but rather a focus on fairness. It is the commitment to values which is the key to explaining and influencing employees' behaviour and which motivate them to voluntarily adopt organisation's values as their own.

5. Legality, legitimacy and legacy

Compliance approach and integrity approach do not constitute a simple dichotomy. They are not only opposite to but supplements of each other. Ethical values are appreciated by the compliance approach as well as rules are important tools for reaching integrity. The compliance with the basic rules is a precondition of integrity. But too many and detailed rules may destroy trust. Meticulous regulations might be considered by employees as the sign of mistrust and the lack of respect which may decrease their enthusiasm for following the values their employer. The challenge is to create an integrity management system which secures compliance with the basic rules but does not undermine the culture of integrity. The article tries to describe one of the possible solutions for creating an integrity management system meeting both requirements.

The basic idea of the solution comes from Peter Verhezen's study (Verhezen, 2010). He wrote in this study that organisations "do not need to move from the culture of compliance (to culture of integrity), but to transcend, to move beyond, to incorporate compliance into a higher dialectic level of understanding where there does not necessarily need to be conflict between compliance and integrity. The tension between them can be healthy and can force deliberate thinking and better decision making. Limitations should not be felt as negative constrains, reducing freedom, but rather as an increased possibility for freedom and leaving behind some legacy that is engrained in the legitimacy of their excellence" (Verhezen, 2010. p.21).

Figure 2. Mode of action of legality



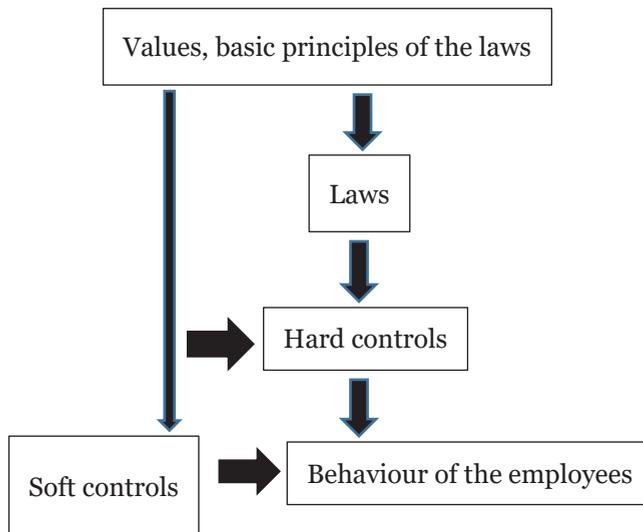
Source: Own representation.

The main concern of the compliance approach is legality, which is the state of being in accordance with the obligations imposed by the law. Organisations pursuing compliance approach try to reach and sustain the state of legality by the introduction of hard controls as it is described in Figure 2.

If hard controls work well employees of the organisation act in line with the laws in every situation regulated by hard controls, but compliance with the laws are not insured when there isn't any hard control to be applied in the given situation. In these situations compliance depends on the employee's decisions made without specific controls. It makes clear that there is a need for soft controls in order to influence employees' behaviour in situations not covered by hard controls.

Soft controls have to be based on values. Therefore organisations must be shifted from the concept of legality to legitimacy. Legitimacy is the conformity to the law, the quality of being legal. This definition is very similar to the notion of legality. But legitimacy has another meaning as well, it is the quality of being reasonable and acceptable. Legitimacy means that a law is followed because its rules are reasonable and acceptable and not because of its enforcement mechanism only. Why are they acceptable? Because the intentions and values on which the law is based are in line with the basic expectations of the society. Organisations moving from legality to legitimacy build their inner regulations on the values and basic principles of the laws and not on their specific provisions only. It is described in Figure 3.

Figure 3. Mode of action of legitimacy

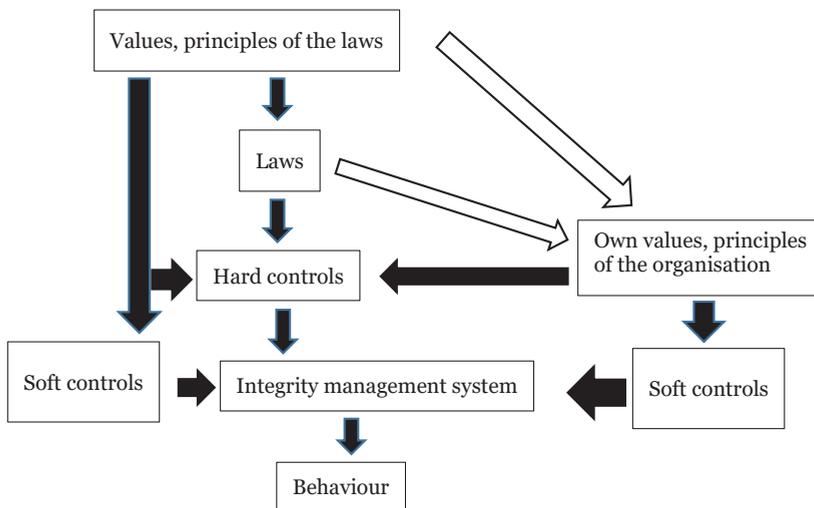


Source: Own representation.

One can see from Figure 3 that tools serving legitimacy embrace devices ensuring legality but they contain new elements as well. On the one hand there are additional hard controls since pursuing the values and principles of the law might require additional inner rules. On the other hand legitimacy gives opportunity for creating soft controls based on the values and principles of the specific laws. For example, a law might emphasize the importance of transparency. Then an organisation going to be legitimate should introduce both hard and soft controls in order to strengthen the transparency of their operations.

By introducing soft controls organisations took the first step into the direction of integrity. This step is rather small hence these soft controls are based on the values of the laws and not on the own value order of the organisation. Integrity has to come from inside and not from outside. Organisations should set up their own value order as a next step to integrity. The value order of an organisation is not independent from the environment of the organisations. It is especially true for the public organisations established to serve public interest on given fields and in specific ways. For profit and non-governmental organisations have to take into consideration stakeholder's expectations and legal requirements also. Certain values and principles are deeply embedded in traditions which have significant effects on the development of the value order. The professional bodies and other employee groups should have a say in this process as well. The multidirectional process is drawn in Figure 4.

Figure 4. Integrity management system based on legality, legitimacy and legacy

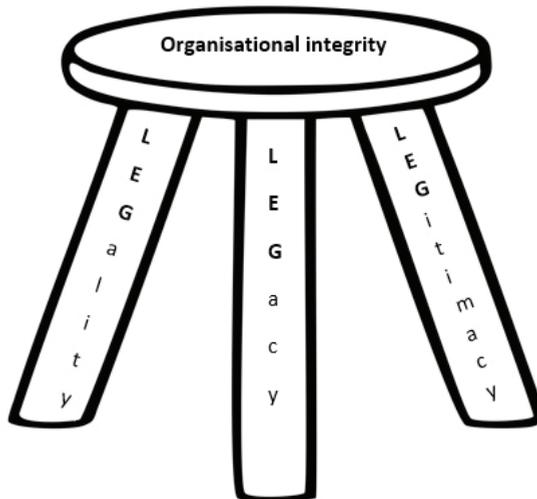


Source: Own representation.

In order to give life to value order organisations should introduce soft controls to strengthen their employees' commitments to the organisational values. Hard controls may play a role also in ensuring that basic principles are respected at all levels of the organisation. The hard and soft controls together constitute the integrity management system of the organisation, as it is shown in Figure 4. Integrity management system influences employees' behaviour in a more effective and better targeted way than a bunch of hard controls or a set of hard and soft controls might influence it.

The setting up of the value order is a sophisticated process resulted in several documents, such as vision and mission statements, strategies defining the prevalent values of the organisation, ethical principles and code of conducts. Certain symbols and artefacts are designed also in order to visualize basic values and aspirations. By these documents leaders and employees of the organisation endeavour to answer the questions: "Who we are and what are we for?" In other words: "What is the legacy inherited from predecessors, and what is the legacy to be left to successors or in a broader sense to our stakeholders, to the future generations, to the society as a whole?"

Figure 5. The three legged stool of sound organisational integrity



Source: Own representation.

Clan-control is based on traditions. Integrity is based on legacy. There is difference between tradition and legacy. It is important to know where we have been, and honour where we have come from, but legacy is more important than tradition. Where we are going is more important that where we have been.

Tradition is tied to the past; based on the way things used to be. Legacy is tied to the future. Legacy is building upon the way things could be, while building for those that have yet to be reached. Legacy says that our best days are ahead. Tradition is a foundation. Legacy is a house. Ancient organisations could build on their traditions and use clan-control. New organisations have to build on the new foundation of their newly developed organisational culture. Organisations without inheriting tradition can build houses also and leave them behind as a legacy for future generations. Legacy is the main motivator of creating the culture of integrity. Legality, legitimacy and legacy are the three legs of an integrity system sound as a three legged stool (see Figure 5).

The three legged integrity stool (legality, legitimacy and legacy) is not a wordplay with the first three letters of the three phrases. They are indispensable and complimentary elements of integrity. The three legged stool is very stable. You can stand at each point of the stool without losing balance. Continuing the metaphor we may conclude that several mixtures of legality, legitimacy and legacy may lead to solid organisational integrity. Every organisation should find the best mixture serving its integrity in the optimal way.

6. Conclusions

The results of the article can be utilised by every public organisation since they must fight against corruption and other misuses of public property. One of the most important scenes of corruption prevention is the (public) organisation where corruption may take place.

Public organisations can enhance their resistance against corruption by creating the culture of integrity, hence organisational culture effectively influences the decision of the member of the organisation. Commitment to values is the key to explaining employees' behaviour and which motivate them to voluntarily adopt organisation's values as their own.

Legality, which is compliance with the basic rules is a precondition of integrity. But organisations searching for integrity must be shifted from the concept of legality to legitimacy, and build their inner regulations on the values of the laws and not on their specific provisions only.

As a next step organisations should set up their own value order based on the legacy inherited from predecessors, and on the legacy to be left to successors or in a broader sense to the stakeholders of the organisation, to the future generations, to the society as a whole. Legacy is the main motivator of creating the culture of integrity.

Public organisations can develop a sound integrity management system by building it on the principles of legality, legitimacy and legacy.

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UNEQUAL DEVELOPMENT IN R&D FIELD IN CEE COUNTRIES

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Abstract: Research and development (R&D) is widely known as a key factor in promoting economic growth and competitiveness. In this context, the authors aim at exploring the differences and changes in the field of R&D in twenty countries in Central and Eastern Europe (CEE). An overall image of these countries in what concerns their R&D indicators and competitiveness at international level and their participation in European Framework Programmes (FPs) is offered. The analysis shows that there are significant differences among the selected countries in CEE in all analysed aspects, with countries outside the EU registering lower performance than the EU members. Thus, the authors present the capacity of the CEE countries to innovate and underline the role of the policymakers in developing sustainable policies on research and development, encouraging investments in R&D field in order to strengthen the performance in research and innovation, and eventually stimulate economic growth.

Key words: RDI; competitiveness; research programmes; science and technology indicators; CEE countries

JEL Classification: R11; R58; O32

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1. Introduction

Regional research, development and innovation (RDI) and regional competitiveness is a relatively new theme of interest in CEE countries. The World Bank uses as main indicators for R&D's capacity of a country the indicators grouped in the Science and Technology category of the World Development indicators, which refer to R&D expenditure, personnel in R&D, journal articles, patents, trademarks and industrial design applications and also high-technology exports (World Bank, DataBank).

In what concerns the regional competitiveness, the Fifth Periodic Report of the European Commission (EC, 1994) identified four factors that contribute to regional competitiveness and explain regional disparities: infrastructure & human development, internal investments, *research & technology* and peripheral location. Other studies show that the indicators that are important for competitiveness can be grouped into three themes: basic infrastructure & accessibility, human capital and other factors, among which *R&D and innovation* plays a significant role (Martin, 2004, p.1) or identified as competitiveness factors: *research & technological development*, human capital, productive capital & foreign direct investments, international trade & clusters, and social capital & institutions (Lenghely and Rechnitzer, 2013, pp.108-109). In order to find international competitiveness rankings one could look to the Global Competitiveness Yearbook for 63 economies (IMD, 2017), where the four global factors used refer to: economic performance, governmental efficiency, business efficiency and infrastructure, which also includes criteria connected with *technology and science* or the Global Competitiveness Report (WEF, 2016-2017), in which the Global Competitiveness Index is calculated for 138 economies and is composed of 3 sub-indexes (basic requirements, efficiency enhancers, and innovation and sophistication factors) and 12 pillars, among which *technological readiness* and *innovation*. There are also two types of reports elaborated at EU level and which follow the methodology used in the Global Competitiveness Report: European Competitiveness Report and The EU Regional Competitiveness Index. As one could notice, aspects concerning RDI / science and technology indicators are of great importance when talking about regional competitiveness.

As the reader will see below, an important instrument in implementing the EU common science and technology policy and helping countries and regions to become more innovative and, thus, more competitive, is the EU Research Framework Programme developed at the EU level in order to finance research projects in Europe. The FPs date back in 1983 when the European Council adopted a resolution creating "Framework programmes for Community

research, technological development and demonstration activities” (EC, 1983), which entered into force in 1984. Since then to present, there have been eight FPs that further developed a more integrated research within the EU encouraging balanced scientific and technological development in Europe. There can also be noted an important change in the budget allocated during this time for FPs, ranging from EUR 3.3 bn. for the first FP (1984-1988) to more than EUR 80 bn. For the present there is FP – Horizon 2020 (2014-2020) going on. Over the time, both the scale and the scope of activities covered by the framework programmes changed significantly. There can be noticed a shift from areas such as energy, communication and information technology towards areas such as life sciences and environment. The funds offered through these programmes aimed especially at transnational co-funded research activities and schemes for training and mobility in which both public and private sectors researchers were involved. The FPs fund high-quality, competitive R&D, producing mainly intermediate knowledge products, reflecting the needs and interests of the R&D actors in Europe.

Even though there are lots of reports engaged by the European Commission concerning the development, implementation and the results & impact for each of the analysed FP (monitoring reports, impact assessments, ex-post evaluations), the focus is, generally, on the more developed countries of Europe and especially on the older EU members, who benefited most from the very beginning by the EU funds provided through the FPs. Prof. Eric Arnold (Arnold, 2011a, 2011b) mentions among long-term effects of the Framework Programmes “setting agendas, creating road maps and coordinating the efforts of research communities”, which could lead to “the emergence of new fields and technological trajectories, restructuring of the European research effort, improvements in policymaking and increased competitiveness”.

There is little empirical evidence concerning the participation and impact for only some or one of the countries in the CEE, especially those that are already members of the EU, and usually focussing on only one FP or thematic area within a FP. Some examples that could be given in this sense and their conclusions are outlined below. An analysis of the participation of the CEE EU member states in the 7th FP (Rauch and Sommer-Ulrich, 2012) shows that success of individual participation of the countries in a FP cannot be explained by taking into account only one indicator, but one has to look at a series of aspects such as: nature and frequency of participation, allocation returns, thematic priorities of the FP, and also at the national research environment of the specific country. The main conclusion of the study reflects the structural relations needed for successful participation such as: scientific excellence, connectivity or cooperation, experience & management skills and R&D financing.

Varga Attila and Sebestyen Tamas are two authors that elaborated a number of studies in the field of FP participation of the CEE countries (that are EU members) and the impact of this participation on innovation development in these countries. In one of their studies (Varga and Sebestyen, 2013) the authors try to answer the question “Does EU FP participation lead to better innovative performance”. The authors took into consideration CEE Objective 1 regions in comparison with regions in the rest of the EU during 1989-2009. They came to the conclusion that “knowledge transferred from FP network positively influences the impact of FP research subsidies on regional innovation in CEE objective 1 regions” and that “interregional knowledge networks can substitute for the critical mass of localized resources for innovation in lagging regions”.

In a more recent paper, Varga and Sebestyen (2017) focus on the impact of FP participation on regional innovation. The area of study was information science and technology in three FPs (FP5-7). This paper came to the conclusion that FP networks help knowledge transfer, which contributes to patenting in CEE objective 1 regions and that innovation in these regions tends to rely more on external knowledge transferred via FP funded research, compensating for their less developed research infrastructure. It also suggests that regions in CEE countries should strengthen research excellence and scientific networking in order to increase regional innovativeness.

No evidence was found in the literature regarding an analysis of the situation in all 20 selected countries in CEE.

In this context, it is considered that such an analysis is important in order to have a clear view on one hand on the CEE countries' capacity to implement RDI projects and on the other hand on the participation of these countries in FP projects.

2. Data and methodology

For the proposed analysis 20 countries in CEE were selected and grouped in three categories: EU members (Bulgaria-BG, Croatia-HR, the Czech Republic-CZ, Estonia-EE, Hungary-HU, Latvia-LV, Lithuania-LT, Poland-PL, Romania-RO, the Slovak Republic-SK, Slovenia-SI), Eastern Partnership members (Belarus-BY, Moldova-MD, Ukraine-UA) and EU candidate and potential candidate countries (Albania-AL, Bosnia and Herzegovina-BA, Kosovo-XK, Macedonia-MK, Montenegro-ME, Serbia-RS).

The analysis takes into consideration the last three programming periods (1994-1999, 2000-2006, 2007-2013) and also the perspectives for the present period 2014-2020. In terms of Framework Programmes this means the last five: FP4 (1994-1998), FP5 (1998-2002), FP6 (2002-2006), FP7 (2007-2013) and H2020 (2014-2020), because in the previous periods, the involvement of the 20 selected countries in FPs was close to 0.

For showing the development of the selected countries in the field of R&D, the authors used as main indicators the World Development Indicators offered for 264 countries by the World Bank, in the Science and Technology category: the R&D expenditure as a % of GDP, the number of researchers, journal articles, patent, trademark and industrial design applications and high-technology exports.

Regarding the competitiveness of these countries, we took into consideration four main pillars (as presented in The Global Competitiveness Report): macroeconomic environment, higher education and training, technological readiness and innovation.

The analysis undertaken represented a multi-layered challenge. The first step was to show an overall image of these countries in what concerns their R&D indicators and competitiveness at international level, and then, in the second step, to analyse their participation in European R&D projects.

For the first step the data was collected from the official database offered by the World Bank (Data Bank – World Development indicators – <http://databank.worldbank.org/data/reports.aspx?source=world-development-indicators>) for the 20 countries and the indicators mentioned above for the period 1994-2016 and then analysed. In order to present the competitiveness of the selected countries, official reports elaborated by the World Economic Forum were analysed, concretely the Global Competitiveness Reports and the Global Competitiveness Index (GCI) for the period 2001/2002 - 2016/2017. We have to mention that there were some limitations concerning data availability, in the sense that data was not available for all countries, for the entire period and for all indicators offered by the World Bank. In terms of time, the most problematic period was the one before 2004, especially for three indicators: industrial design and trademark applications and scientific and technical journals articles. Also, most problems with data availability arose in the case of countries from the second and third group (especially Kosovo). The same situation was in the case of GCI, with Belarus and Kosovo not included in the list of countries analysed, and with other countries included over time: Croatia (2002/2003), Macedonia (2003-2004), Albania and Bosnia-Herzegovina (2006-2007), Montenegro and Serbia (2007-2008) and Moldova (2010-2011).

For the second step the authors used the official information offered by the European Commission, CORDIS datasets, referring to the participation of the twenty countries in the 5 analysed FPs. The datasets comprised over 78.000 projects for the five programmes and a total of 14.082 projects implemented in the selected countries were analysed taking into consideration the number of projects in which at least one partner from the 20 CEE countries were involved, the number of projects in which a partner from these countries was the leader and also the number of projects financed under specific programmes and thematic area within each FP. Details on specific programmes and thematic areas as shown in Annex 1.

3. Results

The region formed by the twenty Central and Eastern European countries is a very diverse one both in demographic and economic terms. In 2016 this region had over 179 million people out of which 58% from the first group, 32% from the 2nd group and the rest from the 3rd group. The largest countries were Ukraine (25%), Poland (21%) and Romania (11%). As regards the GDP/capita in PPP (constant 2011 international \$), the highest values in the last years were registered in Czech Republic, Slovenia and Slovak Republic (all of them with values of around 30,000\$, under the EU average of 36,198 \$ in 2016) and the lowest in Moldova (with only 5,000\$ in 2016, over 6 times lower than Czechia). The highest difference in GDP/capita was in 2000, when Slovenia registered a value almost 10 times higher than the one in Moldova. During the analysed period most of the countries registered a decrease in GDP/capita at the end of the '90s and also in 2009, with one exception, Poland, whose GDP/capita increased every year between 1994 and 2016. One can notice that there are great disparities in terms of GDP/capita both at regional level and within the three groups. The highest difference can be noticed in the case of the second group, the GDP/capita in Belarus being 3.4 times higher than the one in Moldova. The GDP/capita of the Czech Republic is approximately twice as big as the GDP/capita in the two best performing economies in the 2nd and 3rd groups, Belarus and Montenegro. Also, the least developed country in the 1st group had a GDP/capita higher than the least developed countries in the 2nd and 3rd groups (Moldova and Kosovo).

The analysis of the Science and technology indicators shows the following results:

- the R&D expenditure as % of GDP (data available until 2014) was over the EU average in Slovenia (2.39%) and knew an important increase in the Czech Republic during the last years, reaching 2% in 2014, and an important decrease in Estonia from 2.3% in 2011 to 1.4% in 2014. Values over 1% were also registered in Hungary and Lithuania. The lowest and decreasing percentage of the R&D expenditure in GDP was registered in Romania (only 0.38%). The analysis of the situation in the 2nd and 3rd group of countries shows that all countries had under 1% of the GDP used as expenditures in R&D field knowing important fluctuations over time, with Ukraine and Serbia registering the highest values (0.66%, respectively 0.78%).
- relating to the number of researchers and technicians in R&D (per million people) Slovenia registered a higher number than the EU average (with over 4,000 researchers and 2,000 technicians in 2014), followed by the Czech Republic and Estonia. Again, the lowest number of researchers

and technicians in R&D were registered in Romania for the 1st group (922 researchers and 229 technicians in 2014). For the 2nd group the hierarchy was led by Ukraine (with 1026 researchers and 191 technicians in 2014) and by Serbia for the 3rd group (with 1464 researchers and 281 technicians in 2014). The underperformers for these indicators were Moldova for the 2nd group and Albania and Kosovo for the 3rd one.

- the situation is a bit different when it comes to the number of scientific and technical journal articles, especially for the first group of countries, the leaders, this time, being in 2013 Poland (28,753 articles), the Czech Republic (14,022 articles) and Romania (who was on the last places concerning R&D expenditures and researchers & technician in R&D, with 11,164 articles). The lowest values were registered by Latvia and Estonia (with a little over 1,000 articles), Moldova (226 articles) and Kosovo (124 articles). For the 2nd and 3rd groups the leaders were again Ukraine and Serbia, but the number of articles in these two countries was 4, respectively 6 time lower than the one registered by Poland.
- for the indicators referring to patent, industrial designs and trademark applications the authors found that the leaders are Poland, the Czech Republic, Croatia, Hungary and Romania for the 1st group and Ukraine and Serbia for the other two groups.

Referring to the competitiveness of the CEE countries the first thing one should observe is that Moldova and Ukraine are situated in Stage 1 and transition from stage 1 to stage 2 (factor driven economies), and that there are only three countries that are included in the Stage 3 Innovation-driven economies (Czech Republic, Estonia and Slovenia), three of the countries that also register better values in the analysed R&D indicators. The countries from the 2nd group are situated in Stage 2 (efficiency driven economies) together with Romania and Bulgaria and the rest of the countries in the first group are situated in the transition phase from Stage 2 to Stage 3. The Global Competitiveness Index shows us that in 2016-2017 the best positions were occupied by Estonia (30), the Czech Republic (31), Lithuania (35) and Poland (36), situated in top 40 and Macedonia (68), Albania (80) and Ukraine (85), situated in top 90.

During the analysed period, the selected countries registered important fluctuations but for most of them, the scores registered in 2016/2017 were higher than the ones in 2006/2007. Estonia and the Czech Republic were the best performers in all 4 analysed pillars (except for Higher education) and also Lithuania (except for Innovation). Slovenia was the one that registered the best ranks in the two pillar Higher education and Innovation. Macedonia and Montenegro registered better performance in all 4 pillars except for Technological readiness, respectively Higher education where better rankings

had Serbia, respectively Albania. For the 2nd group Ukraine had the best rank in GCI and also for Higher education and Innovation, and Moldova had better rankings for the other two pillars (Technological readiness and Macroeconomic environment).

Table 1. Research and development expenditure in CEE countries during 1996-2014 (% of GDP)

Country	1996	2000	2004	2006	2008	2010	2013	2014
BG	0.51	0.50	0.47	0.44	0.45	0.57	0.64	0.80
HR	..	1.04	1.03	0.74	0.88	0.74	0.82	0.79
CZ	0.90	1.12	1.15	1.23	1.24	1.34	1.91	2.00
EE	..	0.60	0.85	1.12	1.26	1.58	1.71	1.44
HU	0.63	0.79	0.86	0.99	0.99	1.15	1.40	1.37
LV	0.40	0.44	0.40	0.65	0.58	0.61	0.61	0.69
LT	0.49	0.58	0.75	0.79	0.79	0.78	0.95	1.01
PL	0.65	0.64	0.56	0.55	0.60	0.72	0.87	0.94
RO	0.71	0.36	0.38	0.45	0.57	0.45	0.39	0.38
SK	0.89	0.64	0.50	0.48	0.46	0.62	0.83	0.89
SI	1.27	1.36	1.37	1.53	1.63	2.06	2.60	2.39
EU	1.70	1.74	1.76	1.77	1.85	1.93	2.03	2.04
BY	1.00	0.72	0.63	0.66	0.74	0.69	0.67	..
MD	0.87	..	0.35	0.41	0.53	0.44	0.35	0.37
UA	..	0.96	1.08	0.95	0.85	0.83	0.76	0.66
AL	..	..	..	..	0.15	..	..	..
BE	..	..	0.02	0.02	0.02	..	0.33	0.26
XK	..	..	..	..	..	..	..	..
MK	..	0.42	0.23	0.19	0.22	0.22	0.44	..
ME	..	..	1.02	1.24	..	..	0.37	0.36
RS	..	0.90	0.30	0.47	0.37	0.74	0.73	0.78

Source: World Development Indicators.

Framework programmes finance collaboration among actors in R&D field located in various parts of Europe and help knowledge transfer via research networks across European regions that are located close or far from each other. These programmes offer the largest support from the EU in the research field. FP4 objectives were to assure support for the competitiveness of European industry, contribution of science and technology to the satisfaction of society's needs and support to the Community's common policies (Decision No 1110/94/

EC, 1994). FP5 was elaborated in order to solve problems and respond to the EU's major socio-economic challenges, focussing on technological, industrial, economic, social and cultural aspects (CORDIS, 1998). FP6 has two main strategic objectives: strengthening the scientific and technological bases of industry and encourage its international competitiveness while promoting research activities in support of other EU policies (CORDIS, 2002). FP7 was designed to respond to Europe's employment needs, competitiveness and quality of life (CORDIS, 2007). H2020 emphasises excellent science, industrial leadership and talking societal changes aiming at ensuring that Europe produces world-class science, removes barriers to innovation and makes it easier for the public and private sectors to work together in delivering innovation (EC, 2014).

Table 2. Scientific and technical journal articles in CEE countries during 1996-2014 (number)

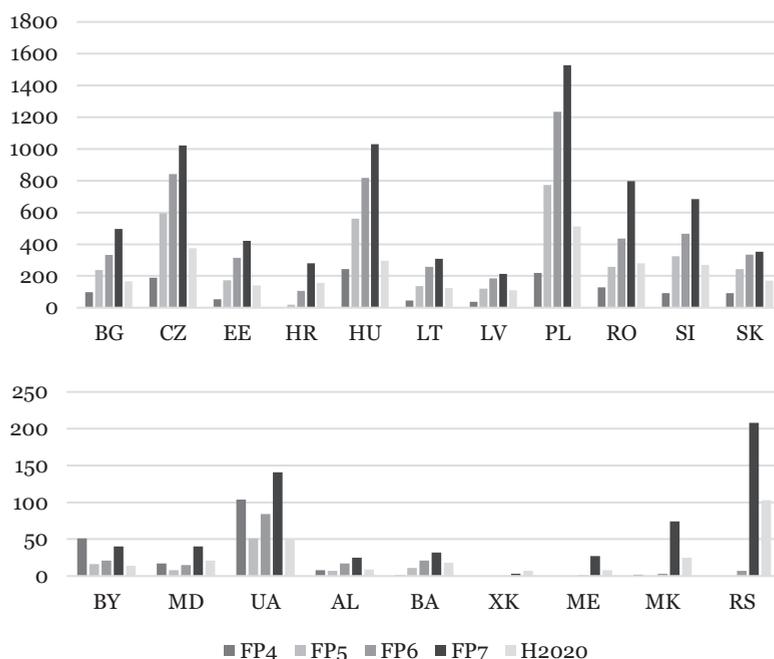
Country	2000	2004	2007	2009	2011
BG	1,527	1,603	2,372	2,453	2,434
HR	1,727	2,518	3,480	4,177	4,667
CZ	4,905	6,773	9,651	11,026	13,152
EE	442	604	999	1,119	1,366
HU	3,978	4,597	5,676	5,894	6,251
LV	258	264	435	649	1,216
LT	459	1,104	1,582	2,131	2,171
PL	10,948	16,647	20,379	22,722	25,044
RO	2,054	2,363	4,783	8,841	10,265
SK	1,971	2,273	2,721	3,106	3,795
SI	1,631	1,880	2,659	3,183	3,624
EU	338,989	402,907	495,075	541,145	575,024
BY	1,011	1,076	1,260	1,160	1,088
MD	151	105	148	197	204
UA	4,420	4,739	5,156	5,312	6,119
AL	23	22	41	77	161
BE	26	110	251	369	481
XK	4	7	33	95	109
MK	151	244	254	380	421
ME	0	4	42	61	131
RS	1,178	1,260	2,477	3,510	4,712

Source: World Development Indicators.

Analysing the participation of CEE countries in FPs one could notice that the highest number of projects contracted were on FP7 (a total of 25.607 projects and 5.331 projects in which CEE countries were participants and/or coordinators).

The highest participation share of the selected countries in total projects was in the case of FP6 (33% out of 10.091 projects), followed by FP7 (with 21%) and H2020 (with already 18%). Most participants and coordinators in FP project (for all FPs) were from Poland, Hungary, the Czech Republic, Ukraine and Serbia. The authors want to underline the fact that Poland was also the country with most projects coordinated. Except for FP4, Hungary also had the most projects as a coordinator, followed by the Czech Republic for FP5 and FP7. A higher number of coordinators of FP projects could be also found in Latvia (for FP4), Romania (for FP6) and Slovenia (for H2020) in the first group, Ukraine for all FPs (except FP4) from the 2nd group and Serbia (for the last 3 FPs) from the 3rd group.

Figure 1. Participation in FPs (1994-2017) – no. of projects with participants from CEE countries



Source: own processing of the data from CORDIS datasets.

The main results of the analysis on specific FP shows the following:

- in FP4 (763 projects) the most participants were from Hungary, Poland, the Czech Republic, Ukraine and Albania and the themes of most interest were: INCO – Cooperation with third countries and international organisations (67% of the total projects with participants from CEE), ENV – Environment and climate and TRANSPORT – Transport research programme;
- in FP5 (2,714 projects) the leaders were Poland, the Czech Republic, Hungary and Bosnia-Herzegovina, and the most appealing programmes were GROWTH – Competitive and sustainable development, EESD – Energy, environment and sustainable development, LIFE QUALITY – Quality of life and management of living resources and IST – Information society technologies;
- most of the participants in FP6 projects (3,336 projects) were from Poland, Hungary, Czech Republic, Ukraine and Serbia. The themes that attracted most participants were: IST – Information society technologies, MOBILITY – Marie Curie actions – Human resources and mobility, SUSTDEV – Sustainable development, global change and ecosystems and SME – SME activities;
- referring to FP7 (5331 projects) the majority of the participants were again from Poland, Hungary, Czech Republic, Ukraine and Serbia. The most sought thematic areas were PEOPLE – support for researcher mobility and career development – Marie Curie actions, ICT – Information and communication technologies (COOPERATION) and SME - Research for the benefit of SME (CAPACITIES);
- in the case of H2020 (1,938 projects) most participants came from Poland, Czech Republic, Hungary, Ukraine and Serbia and the thematic areas with highest demand were: LEIT – Leadership in enabling and industrial technologies, MSCA – Marie Sklodowska-Curie actions, INNOVATION – Innovation in SMEs and ENERGY – Secure, clean and efficient energy. In this case, one should also consider the fact that this programme is an ongoing one and the performances obtained so far are good and will most probably improve in the next years.

4. Conclusions

The selected countries are very different as size (number of inhabitants) and economic development (GDP/capita). The analysis shows that there are also significant differences among the selected countries in CEE both in terms of R&D indicators & competitiveness and in their involvement in projects financed through EU Framework Programmes (FPs). The CEE countries are to be found at the lower end of the hierarchy regarding their participation in FPs and also have a low

capacity for R&D personnel and infrastructure compared to the older EU member states (EU-15). These differences could also be observed both between the groups of countries, as defined by the authors, and within these groups, with EU member countries registering better values for the selected indicators, better places in competitiveness hierarchy and more involvement in FPs than the countries in the other two groups (Eastern Partnership members and EU candidate and potential candidate countries).

The differences among the analysed countries are significant, for example, the R&D expenditure in GDP ranges from 0.15% in Albania to more than 2% in Slovenia and the Czech Republic. From the innovation point of view, one can also notice significant differences among the CEE countries, some of them being placed in top 50, such as Estonia, Slovenia, the Czech Republic and Lithuania, and others at the end of the hierarchy, such as Moldova and Bosnia Herzegovina. 7 out of the 20 analysed countries were situated in the second half of the CGI hierarchy in 2015-2016.

With regard to the involvement of these countries in R&D projects financed by the EU within the FP4 – FP7 and Horizon 2020 Programmes, an improvement in all the selected countries' participation in FPs could be noticed for the entire analysed period (1994-2017). The most involved CEE countries in FP projects were Poland, Hungary and Czech Republic in the first group, Ukraine in the second group and Serbia in the third group, countries that also registered better performance in the analysed R&D indicators and in GCI. If in FP4 and FP5 the most interesting themes for the participants from CEE countries were those referring to cooperation and environment, for the last three FPs a shift could be noticed to human resources and mobility, information and communication technologies and innovation. These preferences show us that these countries became more conscious of the fact that better human resources in R&D and better R&D networks could help all of them improve their competitiveness and innovation capacity at global level.

The authors consider that this analysis is important for policymakers and all other actors in the field of R&D in order to help them acknowledge the fact that these countries should get more involved and make more of the opportunity to participate in such programmes. In order to do that CEE countries should elaborate or improve their RDI policies and also their capacities to develop in this field. Future research foreseen by the authors envisage more detailed analysis of the R&D projects in terms of funding, interest of each country in CEE in the specific programmes and themes, and the results obtained through the implementation of these projects so that they could come with more specific recommendations for the CEE countries on how to improve their R&D environment and policy.

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Annex

Analysed Framework Programmes – specific programmes and thematic areas

FP4 – 1994-1998	FP5 – 1998-2002	FP6 – 2002-2006	FP7 – 2007-2013	H2020 – 2014-2020
FP4-ACTS	FP5-EAECTP C	FP6-AEROSPACE	FP7-COH	H2020-EU1.1. - ERC
FP4-BIOMED 2	FP5-EESD	FP6-CITIZENS	FP7-ENERGY	H2020-EU1.2.- FET
FP4-BIOTECH	FP5-GROWTH	FP6-COORDINATION	FP7-ENVIR	H2020-EU1.3. -MSCA
FP4-BRITE / EURAM 3	FP5-HUMAN POTENTIAL	FP6-EURATOM	FP7-EURATOM	H2020-EU1.4. - INFRA
FP4-ENV 2C	FP5-INCO 2	FP6-FOOD	FP7-GA	H2020-EU2.1. - LEIT
FP4-ESPRIT 4	FP5-INNO	FP6-INCO	FP7-HEALTH	H2020-EU2.2. - RISK
FP4-ESSI 2	FP5-IST	FP6-INFRA	FP7-ICT	H2020-EU2.3. - INNO
FP4-FAIR	FP5-LIFE QUALITY	FP6-INNOVATION	FP7-IDEAS-ERC	H2020-EU3.-EU2.- FTIPilot
FP4-INCO		FP6-IST	FP7-INCO	H2020-EU3.1. - HEALTH
FP4-INNO		FP6-JRC	FP7-INFRA	H2020-EU3.2. - AGRI
FP4-MAST 3		FP6-LIFESCIHEALTH	FP7-JTI	H2020-EU3.3. - ENERGY
FP4-NNE JOULE		FP6-MOBILITY	FP7-KBBE	H2020-EU3.4. - TRANSP
FP4-SMT		FP6-NMP	FP7-NMP	H2020-EU3.5. - ENVIR
FP4-TELEMAT		FP6-POLICIES	FP7-PEOPLE	H2020-EU3.6. - SOCIETY
FP4-TMR		FP6-SME	FP7-REGIONS	H2020-EU3.7. - SECURITY
FP4-TRANSP		FP6-SOCIETY	FP7-REGPOT	H2020-EU4. - DISEMINATION
FP4-TSER		FP6-SUPPORT	FP7-SECURITY	H2020-EU5. - SCIENCE
		FP6-SUSTDEV	FP7-SIS	H2020-Euratom
			FP7-SME	
			FP7-SPACE	
			FP7-SSH	
			FP7-TRANSP	

Source: own compilation based on data from programmes' presentation.

CORPORATE CAPITAL STRUCTURE DECISIONS – EMPIRICAL EVIDENCES ON DETERMINANT FACTORS

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Abstract: Starting from concepts covering the theories of capital structure and the financial structure of a corporation, this paper identifies the determinant factors of the capital structure of a corporation based on the different existing theories from the literature review. The influence of several corporate specific internal factors was tested on a sample of 10 companies from the hotel industry listed on The New York Stock Exchange, for a time period of 10 years, using the Gretl software package and the OLS, FEM and REM techniques. For simple linear regressions, the explanatory variable with the strongest influence on the level of debt of the company is the asset tangibility. For multiple regressions, the profitability remains positively correlated to the debt ratio, while the size, tangibility, asset turnover and age proved to be negatively correlated to the debt ratio of the analyzed companies.
Key words: debt ratio; profitability; company size; asset structure; panel econometrics

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1. Introduction

The access to financing and its cost represent the most important decisions regarding the optimal capital structure of a corporation. A business has to be aware in what assets to invest, how much to invest and how to raise the necessary cash. Capital structure basically refers to the sources of financing employed by the firm. The mixture of debt and equity is important because it comes at a certain cost for companies. Capital structure also matters because of the different tax implications of debt versus equity and the impact of corporate taxes on a firm's profitability. Thus, nowadays firms must be prudent in their borrowing activities to avoid excessive risk and the chance of financial distress or even bankruptcy. The capital structure of a company is essential not only for maximizing the enterprise value but also for stimulating the growth of shareholders' benefits.

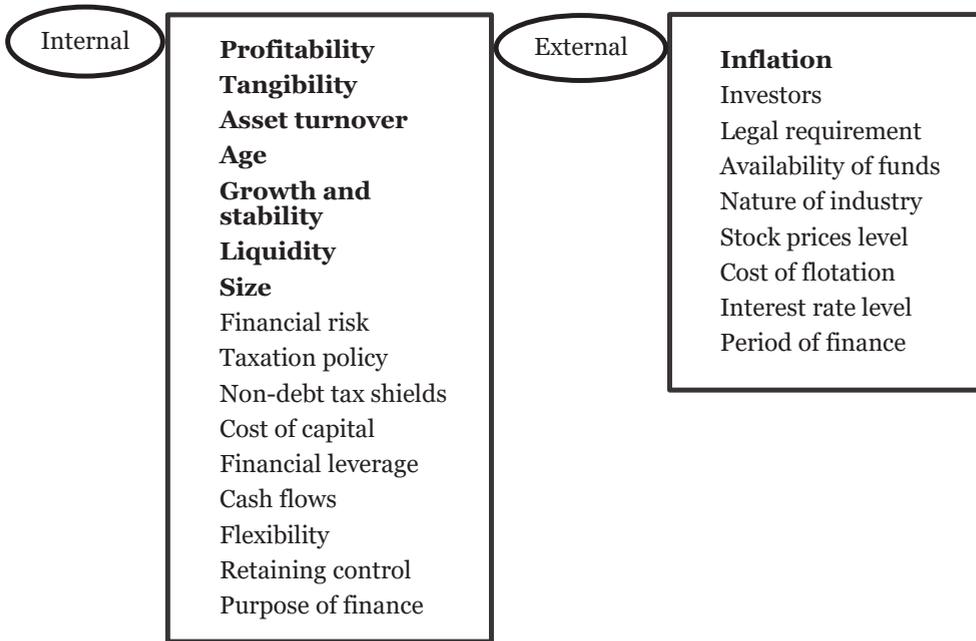
In the specialized literature, the factors that affect the capital structure of a firm, that are capable of explaining the cross-sectional and time-series variation in firms' leverage ratios and thus influence the capital structure, are classified into two major categories, according to Figure 1. (Satyaprasad and Raghu, 2010, p.45). Still, recent research has proved that the capital structure determining factors cover even more variables than the ones presented in Figure 1, for example Naseem *et al.* (2017) investigated the positive effect of the board size of non-financial Pakistani companies. This paper considers mostly the internal factors' impact on the financing decisions of American companies operating in the hotel industry, as the external factors are generally common for all companies.

The hospitality industry is growing very rapidly and contributing to nearly 10% of the world's GDP. In the last decades, the hospitality industry has undergone a vigorous process of expansion. The U.S hotel industry sector registered a total revenue of 117.8 billion US\$ in 2003 and followed an increasing trend until 2007. Consequently, the global crisis left its mark on this sector of the economy, so in 2008 and 2009 these revenues registered a gradual decline. Between 2009 and 2013, a stable growth was noticeable in the revenues of this sector, reaching the amount of 163 billion US\$ in 2013. Estimations show that the revenues of the global hotel industry will grow to about 553.8 billion US\$ by 2018.

This study was based on data collected from the leading hotel companies operating in the United States of America. The purpose of this study is to synthesize the classical and modern theories of capital structure, to identify the factors that have a significant impact on their financing decision and to construct econometric models starting from a set of observations.

The paper evaluates the dependent variable, further focusing on defining and measuring the explanatory variables, the collection of data and on the econometric models applied. The last part of paper contains the research results, their interpretation and the final conclusions.

Figure 1. Factors influencing the capital structure



Source: Authors' processing.

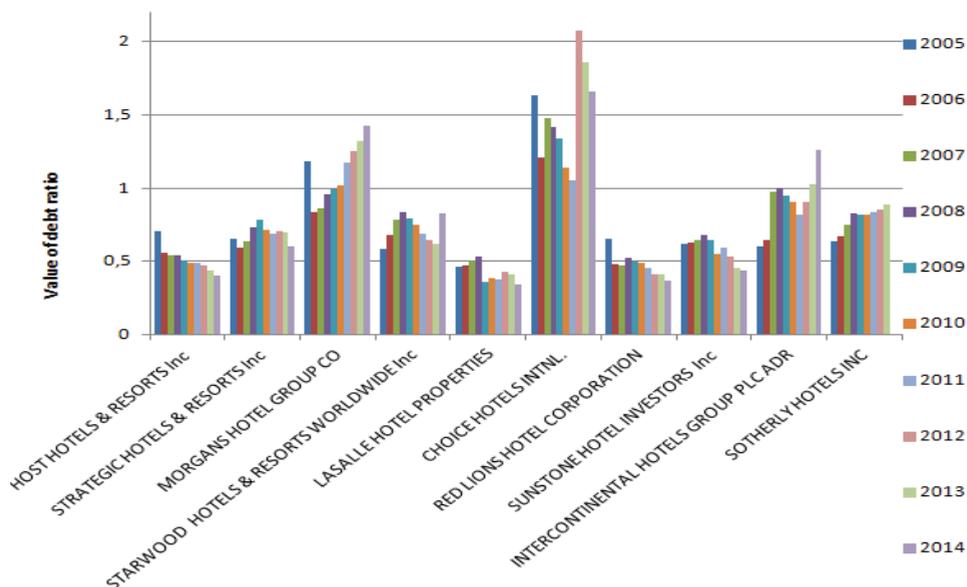
2. Literature review

In order to measure the indebtedness of a company, authors of previous empirical studies such as Rajan and Zingales (1995) have used different measures of the capital structure. A widely used ratio is the debt to equity ratio of a company as an endogenous variable (Naseem *et al.*, 2017). In this study, the dependent variable will be considered the traditional measure of leverage, the ratio between the total debt and total assets.

$$\text{Debt ratio} = \text{Total debt} / \text{Total assets}$$

The debt ratio is a financial ratio that measures the extent of a company's leverage. It can be interpreted as the proportion of the company's assets that are financed by debt. The higher the ratio, the more leveraged the company and the greater its financial risk. Debt ratios vary widely across industries. A ratio greater than 1 indicates that a considerable proportion of assets are being funded with debt, while a low ratio indicates that the bulk of asset funding is coming from equity. If this ratio is greater than 1 it also suggests that the company may be putting itself at risk of not being able to pay back its debts.

Figure 2. Evolution of the debt ratio of the companies during 2005-2014



Source: Authors' processing in Excel.

Figure 2 contains the values of the debt ratio, computed for ten companies that activate in the hotel industry, listed on the New York Stock Exchange, in the 2005-2014 time period. Among all the companies analyzed, the highest levels of debt ratio were registered for CHOICE HOTELS INTNL. For this hotel, an interesting evolution can be identified between 2011 and 2012, as from the analyzed years (2005-2014), the lowest values were registered in 2011 and the highest ones in 2012 and thus results the highest growth.

On the following positions of high registered values of debt ratio there appear MORGANS HOTEL GROUP CO and INTERCONTINENTAL HOTELS GROUP PLC ADR. They both follow an ascending trend, suggesting that the value of liabilities is exceeding more and more the level of their assets. A dramatic increase of this ratio suggests that the level of liabilities exceeds the total value of assets and as a consequence, the company might deal with financial problems.

On the other hand, LASALLE HOTEL PROPERTIES is the company with the lowest level of the debt ratio, followed by RED LIONS HOTEL CORPORATION and HOST HOTELS& RESORTS Inc with values generally below 0.5. This figure is an indicator of the fact that the highest proportion of assets is financed through equity, not debt.

Based on the data availability the following determinants of capital structure were analyzed in this paper: profitability, size, tangibility, liquidity, asset turnover, age, growth and inflation.

- Profitability

Profitability = EBIT / Total assets

EBIT = Earnings Before Interest and Taxes

As for all factors that influence capital structures, there are contradicting opinions concerning the relationship between profits and the capital mix. The pecking order theory predicts a negative correlation between the profitability of a company and its level of debt based on the idea that companies first access internal financing sources (Myers and Majluf, 1984). As profitable firms retain earnings, firms prefer raising capital initially from retained earnings, then from debt, and finally from issuing new equity. This hierarchy of financing choices is due to the adverse selection costs associated with new equity issues in the presence of information asymmetries. In this case, debt grows when investment exceeds retained earnings and falls when investment is less than retained earnings.

According to the trade-off theory, bankruptcy costs, taxes, and agency costs push more profitable firms towards higher leverage while in the agency models of Jensen and Meckling (1976), Easterbrook (1984), and Jensen (1986), higher leverage helps to control agency problems by forcing managers to pay out more of the firm's excess cash. Besides, more profitable companies can access more borrowed funds when having more fixed assets pledged as collateral, and when facing reduced financial risk. The strong commitment to use a larger fraction of pre-interest earnings for debt payments suggests a positive relationship between book leverage and profitability (Satyaprasad and Raghu, 2010, p.50).

- Size of the Company

Size = ln (Total assets)

The size of the company has been proxied by the specialized literature through the natural logarithm of a company's total assets or of its sales revenue (Sarlija and Harc, 2016). The effect of firm size on leverage is ambiguous as larger firms tend to be more diversified and thus do not face high bankruptcy risks. Also, larger firms due to reputation, can also obtain better credit conditions (Booth, 2001; Chen, 2004). Larger firms with less asymmetric information problems should tend to have more equity than debt as with lower information costs equity capital can be raised more easily than for small firms. In the presence of asymmetric information, firm size and target leverage may be negatively correlated, thus sustaining the pecking order theory (Rajan and Zingales, 1995; Bevan and Danbolt, 2002; Titman and Wessels, 1988; Chakraborty, 2013). On

the other hand, the trade-off theory suggests that large companies are able to borrow more than small firms because of lower financial distress and agency costs. Thus, there might be a positive relationship between firm size and leverage according to this theory (Booth, 2001; Wiwattanakantang, 1999; Huang and Song, 2006; Delcours, 2007; Kayo and Kimura, 2011; Lim, 2012; Dang, 2013).

- Asset structure

The asset structure influences the capital structure as funds are needed to make investments on fixed assets and current assets. While for fixed asset investments only long-term sources like the issue of equity, debentures or preference are used, for current asset investments, besides long-term sources, short-term sources are used to meet working capital requirements. Among the financial indicators that measure how a society distributes its assets, we distinguish the tangibility and liquidity.

- Tangibility

Tangibility = Fixed tangible assets / Total assets

The tangibility of assets can be considered a measure for the level of collateral that a company can offer to its debtors. Empiric research describes different perspectives. The trade-off theory supports a direct relationship between debt and tangibility (Titman and Wessels, 1988; Rajan and Zingales, 1995; Delcours, 2007; Kayo and Kimura, 2011; Drobetz, 2013). The higher the fixed-to-total assets, the lower the financial distress as tangible assets suffer from a smaller loss of value in case bankruptcy occurs. Moreover, tangible assets can be more easily valued by outside investors, leading to lower information asymmetry, higher debt capacity and less pronounced agency costs of debt (Baker and Martin, 2011, p. 24).

On the other hand, the pecking order theory sustains the negative relationship between tangible assets and debt (Huang and Song, 2006; Joeveer, 2013; Oztekin and Flannery, 2012). Firms with less collateral deal with higher information costs and thus rather issues debt than equity.

- Liquidity

Liquidity = Cash and bank accounts / Total assets

According to the pecking order theory, a negative relationship is expected between liquidity and leverage, because firms with lower earnings tend to borrow more. A high level of liquidity is not always beneficial, as it suggests the inability of a company to commit to investments. Thus, more liquid companies can only access short term liabilities. As managers may manipulate the liquid assets in order to meet shareholders' expectations, the influence of liquidity on debt should

be noticed through intermediaries, such as potential investors or investment opportunities (Baltaci and Ayaydin, 2014, p.49).

- The asset turnover

$$\text{Asset turnover} = \text{Total sales} / \text{Total assets}$$

The asset turnover is an indicator of efficiency, showing how many times the capital that was invested in total assets, rotates, in order to achieve the company's turnover. The relationship between the asset turnover and debt ratio of a firm was studied by O'Brien and Vanderheiden (1987) and Hutchinson and Hunter (1995).

- Age

Age is the number of years since the establishment of a company. Some researchers sustain that there is a positive correlation between age and debt as the longer the firm's history of repaying its debt, the lower will be its borrowing cost since lenders believe that companies will not engage in asset substitution projects (Diamond, 1989). On the other hand, a negative correlation between age and debt might be sustained as older firms tend to accumulate retained earnings and thus, require less external finance (Rajan, 1994).

- Growth and stability

$$\text{Growth} = \text{Changes in Total assets} = \text{Total assets}_1 / \text{Total assets}_0$$

where: total assets₁ = total assets in current period; total assets₀ = total assets in previous period.

According to the trade-off theory, firms with more investment opportunities are less leveraged because they have stronger incentives to retain profits and avoid underinvestment and asset substitution, that can appear due to stockholder-bondholder agency conflicts. Therefore a negative relationship is expected between growth and debt, and a positive one between growth and equity, as external investors prefer to pay more for shares of companies with higher growth opportunities (Baltaci and Ayaydin, 2014, p.51).

The pecking order theory suggests a positive relationship between leverage and growth opportunities basically because growing companies can access debt more easily. Debt generally increases when the investment is higher than the retained earnings and decreases in the opposite situation. A more complex version of the pecking order theory highlights that firms with larger expected investments can maintain less current leverage in order to avoid financing future investments with equity (Baker and Martin, 2011, p.25).

Raising equity shares is a long-term source by which a firm can fulfill its financial requirements in the initial stages. After the company increases its cash

inflow capacity through sales, it can also raise debt or preference capital for growth and expansion purposes. Earned profits may also be used by companies as a source that provides flexibility and less dependence on external funds. A firm with stable or high sales will be likely to choose a higher amount of debt for their financial requirements as the fixed charges can be easily repaid by such revenue. Besides, relying on more debt will increase the potential returns to the shareholders. Opposite to this, a company with a lower amount of sales revenue will try to reduce their debt because of potential inability to pay the interest. Thus, the capital structure is directly influenced by the growth and stability policies (Satyaprasad and Raghuram, 2010, p.47).

Table 1. Conclusions of capital structure theories

Determinants	Predicted sign by the theories	Empirical evidence
Profitability	-(Pecking order)	Myers and Majluf (1984); Titman and Wessels (1988); Rajan and Zingales(1995); Fama and French (1998); Mathur (2000); Booth <i>et al.</i> (2001); Pandley and Um (2001); Hovakimian <i>et al.</i> (2001); Bevan and Danbolt (2002); Shan and Khan (2007); Gropp and Heider (2010); Sharif <i>et al.</i> (2012).
	+(Trade-off)	Jensen and Meckling (1976), DeAngelo and Masulis(1980), Easterbrook (1984), Jensen (1986), Aggarwal(1994), Burgman(1996)
Tangibility	+(Trade-off)	Titman and Wessels (1988); Rajan and Zingales (1995)
	-(Pecking order)	Oztekin and Flannery (2012)
Asset turnover	-(Trade-off)	Hutchinson and Hunter (1995)
	+(Pecking order)	O'Brien and Vanderheiden (1987)
Growth and stability	-(Trade-off)	Myers (1977); Jensen and Meckling (1986); Titman and Wessels (1988); Smith and Watts (1992); Rajan and Zingales (1995); Fama and French (2002); Bevan and Danbolt (2002); Shan and Khan (2007).
	+(Pecking order)	Kashyap, Rajan and Stein (1998); Booth <i>et al.</i> (2001); Pandey (2001); Drobetz and Fix (2003); Tang and Jang (2007); Cespedes <i>et al.</i> (2010).
Liquidity	-(Pecking order)	Ozkan (2001)
	+(Trade-off)	Deesomsak <i>et al.</i> (2004)
Size of the company	-(Pecking order)	Shah and Khan (2007); Mishra and Tannous (2010)
	+(Trade-off)	Friend and Lang (1988); Mackie-Mason (1990); Rajan and Zingales (1995); Barclay and Smith (1996); Wald (1999); Pandey (2001); Fama and French (2002); Deesomsak, Paudyal and Pescetto (2004); Istaitieh and Rodriguez-Fernandez (2006); Cheng and Shiu (2007); De Jong, Kabir and Nguyen (2008); Serrasqueiro and Rogao (2009); Gropp and Heider (2010).
Age	-(Pecking order)	Petersen and Rajan (1994); Ramalho and Da Silva (2008)
	+(Trade-off)	Diamond (1989)
Inflation	-(Pecking order)	Gungoraydinoglu and Öztekin (2011); Drobetz <i>et al.</i> (2013)
	+(Trade-off)	Joeveer (2012)

Source: Authors' processing after Ayanthan, 2013, p.3.

- Inflation

Annual inflation rate = Yearly rate provided by statistical institutes

Inflation is one of the main macroeconomic indicators of a country's stability. An increase in the inflation rate causes more uncertainty in the economic situation, leading to firms' inability to repay their debts. Higher inflation decreases the benefits of leverage because of an increase in the bankruptcy costs of debt. As lenders demand a higher return, the firm has to pay a higher interest rate, increasing the expected cost of debt for the company. Thus, in case of higher inflation, firms use weak dollars to repay debt and also lower their debt ratios. Therefore, Booth (2001) and Drobetz (2013) suggest a negative effect of inflation of leverage. On the other hand, Joeveer (2012) sustains that a positive relationship is expected between inflation and leverage, due to higher real value tax deductions on debt (Vatavu, 2013, p.182).

The conclusions of capital structure existing theories and empirical evidences on the relationship between the capital structure determinants and leverage are represented in Table 1.

3. Data and methodology

This subsection presents the methods used in this paper, including the research design, the population of the study, the sources used for collecting data, the research instruments, the variables selected, data processing and data analysis.

The data source used for this case study was The New York Stock Exchange. The time period for which the analysis was performed covers a period of ten years, between 2005 and 2014. The information used for the case study were collected from the balance sheet and income statement. As annual records were collected, the 100 observations available at www.nyse.com were analyzed in order to determine the behaviour of the companies regarding the financing decision. The panel data technique with pooled regressions helps examine the effect of different firm indicators on the capital structure, represented by the debt ratio.

For the analyzed period (2005-2014), the descriptive statistics of the debt ratio and of the explanatory variables considered in the study are found in Table 2. The debt ratio varies between 0.34 and 2.07 and has a mean value of 0.76.

Table 2. Descriptive statistics of the variables

Variable	Mean	Median	Minimum	Maximum	Std. dev.	C.V
Debt ratio	0.767	0.675	0.340	2.074	0.343	0.447
Profitability	0.085	0.038	-0.090	0.564	0.139	1.622
Size	7.392	7.764	4.770	9.477	1.372	0.185
Tangibility	0.664	0.756	0.101	0.965	0.263	0.396
Liquidity	0.055	0.034	0.003	0.332	0.063	1.144
Asset turnover	0.532	0.413	0.220	1.957	0.382	0.718
Growth	1.046	1.000	0.745	2.248	0.191	0.182
Inflation	2.280	2.450	-0.400	3.800	1.200	0.526
Age	35.20	22.000	1.000	77.000	25.383	0.721

Source: Authors' processing in Gretl.

In order to identify the relationship between the capital structure of the company and the selected explanatory variables, we will use both simple and multiple linear regression models, applied to panel data. At first the Ordinary Least Squares (OLS) method is used in order to estimate regression models based on panel data (a balanced panel in this case). OLS is a statistical technique which attempts to find the function which most closely approximates the data. OLS tries to find the line of 'best fit', the line that minimizes the total distance between the actual data points and the predicted line (or residuals). This method is effective when the omitted explanatory variables and the considered variables from the model are not correlated. The OLS method may be used on both one-dimensional data (time-series or cross-sectional data) and panel data. After estimating the simple and multiple regressions through the OLS method, another two estimating techniques were used: The Fixed Effects Method (FEM) and The Random Effects Method (REM). The Fixed Effects Method (FEM) eliminates the inefficiency that could appear in case of a correlation between the omitted explanatory variables and the explanatory variables. This model takes into account the heterogeneity of the companies that are in the sample. The unobservable effects are treated as fixed effects, as the phenomena that can influence the dependent variable (capital structure) and which are not included in the analyzed determinant factors, are controlled. The linear form of the fixed effects model is the following equation:

$$y_{it} = a_i + b_{it} + \varepsilon_{it}$$

where $i= 1, \dots, n$ represent the companies, $t=$ time, y_{it} = dependent variable (debt ratio) of company i at time t , x_{it} = independent variable of company i at time t , a_i = omitted explicative variable specific to company i , ε_{it} = residual variable.

The Random Effects method (REM) assumes that the intercept value of an individual unit is a random drawing from a much larger population with a constant mean. The individual intercept is then expressed as a deviation from the constant mean value. REM is appropriate in situations where the random intercept of each cross-sectional unit is uncorrelated with the regressors. Unlike for FEM, time-variant regressors can be used in REM.

The analysis will be started with the OLS method, by introducing 8 simple linear regression models, each of them comprising the dependent variable (the debt ratio) of a company and one explanatory variable. The coefficients of these models will be estimated and the adjusted R^2 will be compared. The model with the highest value of adjusted R^2 implies that the independent variable included in that regression has the highest explanatory power. Therefore in tables comprising the estimations, the coefficients of the independent variables will be presented in the decreasing order of the adjusted R^2 values (from the most significant variables to the least significant ones). In the case of multiple regressions we will follow the 'general to specific' strategy, according to which, starting from all the variables, we eliminate the ones that are not significant at all. Thus we obtain a regression with the highest possible explanatory power and at the same time, with all the independent variables being significant at a certain level.

After establishing the optimum model through the OLS method, we will also estimate the coefficients of this model through the FEM and REM. In order to be able to decide which estimation method is a better alternative, we will use 3 tests: the F-test which will be used for choosing between OLS and FEM; Breusch–Pagan test, for a proper selection between OLS and REM and Hausman test, in order to decide whether FEM or REM offers a better estimation of the regression.

4. Experimental Results Analysis

The first step that is necessary, in order to obtain simple linear regression, is considering the following models and independent variables:

$$\text{Model (1): } y_{it} = a_i + bx_{1it} + \varepsilon_{it}, \quad x_1\text{-tangibility}$$

$$\text{Model (2): } y_{it} = a_i + bx_{2it} + \varepsilon_{it}, \quad x_2\text{-profitability}$$

$$\text{Model (3): } y_{it} = a_i + bx_{3it} + \varepsilon_{it}, \quad x_3\text{-asset turnover}$$

$$\text{Model (4): } y_{it} = a_i + bx_{4it} + \varepsilon_{it}, \quad x_4\text{-liquidity}$$

$$\text{Model (5): } y_{it} = a_i + bx_{5it} + \varepsilon_{it}, \quad x_5\text{-age}$$

$$\text{Model (6): } y_{it} = a_i + bx_{6it} + \varepsilon_{it}, \quad x_6\text{-size}$$

$$\text{Model (7): } y_{it} = a_i + bx_{7it} + \varepsilon_{it}, \quad x_7\text{-growth}$$

$$\text{Model (8): } y_{it} = a_i + bx_{8it} + \varepsilon_{it}, \quad x_8\text{-inflation}$$

After estimating the coefficients of these models with the Gretl software package through linear simple regressions with the OLS technique, the following regressions were obtained:

$$\text{Model (1): } \text{Debt ratio}_{it} = 1.411 - 0.968 \text{ Tangibility}_{it}$$

$$\text{Model (2): } \text{Debt ratio}_{it} = 0.623 + 1.679 \text{ Profitability}_{it}$$

$$\text{Model (3): } \text{Debt ratio}_{it} = 0.443 + 0.609 \text{ Asset turnover}_{it}$$

$$\text{Model (4): } \text{Debt ratio}_{it} = 0.586 + 3.250 \text{ Liquidity}_{it}$$

$$\text{Model (5): } \text{Debt ratio}_{it} = 0.568 + 0.005 \text{ Age}_{it}$$

$$\text{Model (6): } \text{Debt ratio}_{it} = 1.437 - 0.090 \text{ Size}_{it}$$

$$\text{Model (7): } \text{Debt ratio}_{it} = 0.832 - 0.061 \text{ Growth}_{it}$$

$$\text{Model (8): } \text{Debt ratio}_{it} = 0.786 - 0.008 \text{ Inflation}_{it}$$

Table 3. Results of the econometric estimation for the simple regressions

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Constant term	1.411***	0.623***	0.443***	0.586***	0.568***	1.437***	0.832***	0.786***
Tangibility	-0.968***							
Profitability		1.679***						
Asset turnover			0.609***					
Liquidity				3.250***				
Age					0.005***			
Size						-0.090***		
Growth							-0.061	
Inflation								-0.008
R ²	0.550	0.462	0.460	0.364	0.177	0.130	0.001	0.008
R ² _{Adjusted}	0.545	0.457	0.454	0.357	0.169	0.121	-0.010	-0.009

Source: Authors' processing in Gretl.

Note: *** stands for the significance coefficients 1%, ** stands for the significance coefficients 5%, * stands for the significance coefficients 10%

The last 2 models (7 and 8) in Table 3 cannot be interpreted as the variables ‘Growth’ and ‘Inflation’ are not significant. This fact was suggested by both the lack of stars of significance, and the value of adjusted R² around 0. A higher than 0.1 p-value of the variables, automatically implies that the stars of significance are missing (as this means the variables are not significant). Actually, no statistically significant linear dependence of the mean of the debt ratio on growth or inflation was detected. Thus, only the first 6 models of simple linear regression will be interpreted with the OLS technique in the following way:

Model (1): When Tangibility_{it} increases with one unit, Debt ratio_{it} will decrease, in average, ceteris paribus, with 0.968 units.

Model (2): When Profitability_{it} increases with one unit, Debt ratio_{it} will increase, in average, ceteris paribus, with 1.679 units.

Model (3): When Asset turnover_{it} increases with one unit, Debt ratio_{it} will increase, in average, ceteris paribus, with 0.609 units.

Model (4): When Liquidity_{it} increases with one unit, Debt ratio_{it} will increase, in average, ceteris paribus, with 3.250 units.

Model (5): When Age_{it} increases with one unit, Debt ratio_{it} will increase, in average, ceteris paribus, with 0.005 units.

Model (6): When Size_{it} increases with one unit, Debt ratio_{it} will decrease, in average, ceteris paribus, with 0.090 units.

After comparing the adjusted R² of these models we can observe that it takes the maximum value (of 0.545) within the model (1). Thus, we may conclude that the independent variable x_{1it}, representing the company’s tangibility has the highest explanatory power and the model (1) is the most representative. As this variable is the only one that has the value of adjusted R² higher than 0.5, the tangibility has a high influence on debt ratio. The simple regressions with profitability, asset turnover and liquidity registered values between 0.3 and 0.5 for the adjusted R², suggesting a medium influence of these variables on the debt ratio. On the other hand, the simple regressions that considered as independent variables the age and size, registered values lower than 0.3 for the adjusted R² and this fact suggests a weak influence of the variables on the debt ratio.

According to the previously described algorithm, we will construct an optimal multiple regression starting from an initial regression that involves all the 8 independent variables comprised in this case study.

$$Model (a): y_{it} = a_i + bx_{1it} + cx_{2it} + dx_{3it} + ex_{4it} + fx_{5it} + gx_{6it} + hx_{7it} + ix_{8it} + \varepsilon_{it}$$

The coefficients were estimated resulting the following initial multiple regression:

$$\text{Debt ratio}_{it} = 2.786 - 0.992 \text{ Tangibility}_{it} + 1.343 \text{ Profitability}_{it} - 0.520 \text{ Asset turnover}_{it} - 0.003 \text{ Age}_{it} - 0.123 \text{ Size}_{it} + 1.031 \text{ Liquidity}_{it} - 0.173 \text{ Growth}_{it} - 0.007 \text{ Inflation}_{it}$$

Although the adjusted R² registered a relative high value (0.700), similarly to the simple regressions, the variables growth and inflation turned out to be insignificant. For inflation, the p-value was much higher than 0.1, specifically 0.635 and thus this was the variable with the highest p-value. For this reason, inflation was an independent variable which was not an explanatory variable in the multiple regression so it was eliminated.

After eliminating the first insignificant variable, the second model of multiple regression which had to be analysed had the following structure:

$$\text{Model (b): } y_{it} = a_i + bx_{1it} + cx_{2it} + dx_{3it} + ex_{4it} + fx_{5it} + gx_{6it} + hx_{7it} + \varepsilon_{it}$$

Following the same procedure, the parameters of these models were approximated and the correspondent linear regression was obtained:

$$\text{Debt ratio}_{it} = 2.769 - 0.993 \text{ Tangibility}_{it} + 1.302 \text{ Profitability}_{it} - 0.515 \text{ Asset turnover}_{it} - 0.003 \text{ Age}_{it} - 0.123 \text{ Size}_{it} + 1.081 \text{ Liquidity}_{it} - 0.180 \text{ Growth}_{it}$$

Although the adjusted R² registered the highest value for this regression (0.703), this phenomenon might be due to the fact that adjusted R² generally increases when more variables are in a regression, not because it is the most representative one. In this case, the growth registered a p-value of 0.074, which is higher than 0.05 but lower than 0.1, suggesting a low level of significance in this regression. Based on the fact that in the Model (a) of the multiple regression, growth turned out to be insignificant with a p-value of 0.107 and also because in the case of simple regression, growth was also an insignificant variable, we consider that growth should be eliminated from this multiple regression. Thus, a more representative multiple regression may be obtained in which all the variables have a clear explanatory power.

Next, we will construct a multiple regression with the 6 remaining independent variables, with the following form:

$$\text{Model (c): } y_{it} = a_i + bx_{1it} + cx_{2it} + dx_{3it} + ex_{4it} + fx_{5it} + gx_{6it} + \varepsilon_{it}$$

After estimating the parameters of this model, the following multiple regression was obtained:

$$\text{Debt ratio}_{it} = 2.334 - 0.896 \text{ Tangibility}_{it} + 1.045 \text{ Profitability}_{it} - 0.311 \text{ Asset turnover}_{it} - 0.003 \text{ Age}_{it} - 0.111 \text{ Size}_{it} + 0.813 \text{ Liquidity}_{it}$$

In the case of this multiple regression, the adjusted R² registered a value of 0.691026, but this time the liquidity turned out to be insignificant as it registered a p-value of 0.1032, which is higher than 0.1. As a consequence, liquidity should be removed from the model.

Finally, the form of the newly estimated multiple regression has the following structure:

$$\text{Model (d): } y_{it} = a_i + bx_{1it} + cx_{2it} + dx_{3it} + ex_{4it} + fx_{5it} + \varepsilon_{it}$$

The coefficients and the values of adjusted R² for the most representative model were obtained:

$$\text{Debt ratio}_{it} = 2.403 - 0.959 \text{ Tangibility}_{it} + 1.105 \text{ Profitability}_{it} - 0.273 \text{ Asset turnover}_{it} - 0.003 \text{ Age}_{it} - 0.111 \text{ Size}_{it}$$

It was found that this model has a high explanatory power, based on the adjusted R² of 0.681835, but most importantly, this model contains only independent variables that are significant at a high or medium level (as all the variables have 2 or 3 stars of significance).

Table 4. Results of the econometric estimation for 8, 7, 6, 5 variables using the OLS method

	(a)	(b)	(c)	(d)
Constant term	2.786***	2.769***	2.334***	2.403***
Tangibility	-0.992***	-0.993***	-0.896***	-0.959***
Profitability	1.343***	1.302***	1.045***	1.105***
Asset turnover	-0.520***	-0.515***	-0.311**	-0.273**
Age	-0.003***	-0.003***	-0.003***	-0.003***
Size	-0.123***	-0.123***	-0.111***	-0.111***
Liquidity	1.031**	1.081**	0.813	
Growth	-0.173	-0.180*		
Inflation	-0.007			
R ²	0.727	0.726	0.709	0.698
R ² _{Adjusted}	0.700	0.703	0.691	0.681

Source: Author's processing in Gretl.

Table 4 presents the process through which from a model with 8 variables (in which not all the variables are significant), we get to a more representative multiple regression with only 5 variables, but all of them being significant. The

strategy followed is ‘general to specific’ and this assumes that from the original model, containing 8 variables, we have to eliminate one by one the variables which are not significant for the model (generally with a p-value higher than 0.1).

Table 5. Results of the econometric estimation for the most representative multiple regression using OLS, FEM and REM techniques

Estimation method	OLS	FEM	REM
Constant term	2.403***	2.520***	2.403***
Profitability	1.105***	1.511***	1.105***
Size	-0.111***	-0.120***	-0.111***
Tangibility	-0.959***	-0.964***	-0.959***
Asset turnover	-0.273*	-0.401***	-0.273*
Age	-0.003***	-0.003***	-0.003***
Adjusted R ² / ‘Within’ variance	0.681	0.688	0.036

Source: Author’s processing in Gretl.

The final form of the multiple regression was obtained using the OLS technique. Considering that on this panel data we may apply other 2 estimating techniques, Table 5 presents the coefficients, the adjusted R² and the p-values for the final form of the multiple regression, estimated using 3 different techniques: OLS, FEM and REM.

An F-test is any statistical test in which the test statistic has an F-distribution under the null hypothesis. It is most often used when comparing statistical models that have been fitted to a data set, in order to identify the model that best fits the population from which the data were sampled. A low p-value counts against the null hypothesis that the pooled OLS model is adequate, in favor of the fixed effects alternative. The null hypothesis thus supposes that the OLS estimation method is optimum. In order for this hypothesis to be accepted, the p-value has to be higher than 0.05 (as a general rule). In the case of the estimated multiple regression the p-value is 0.28691 and thus the null hypothesis should be accepted. Up to this moment, the OLS estimation method should be chosen.

H₀: OLS is adequate

H₁: FEM is adequate

F(9, 84) = 1.231 with p-value 0.286 => p-value > 0.05 => accept H₀ => OLS is adequate.

Breusch–Pagan test is used to test for heteroscedasticity in a linear regression model. It tests whether the estimated variance of the residuals from a regression are dependent on the values of the independent variables. In that case,

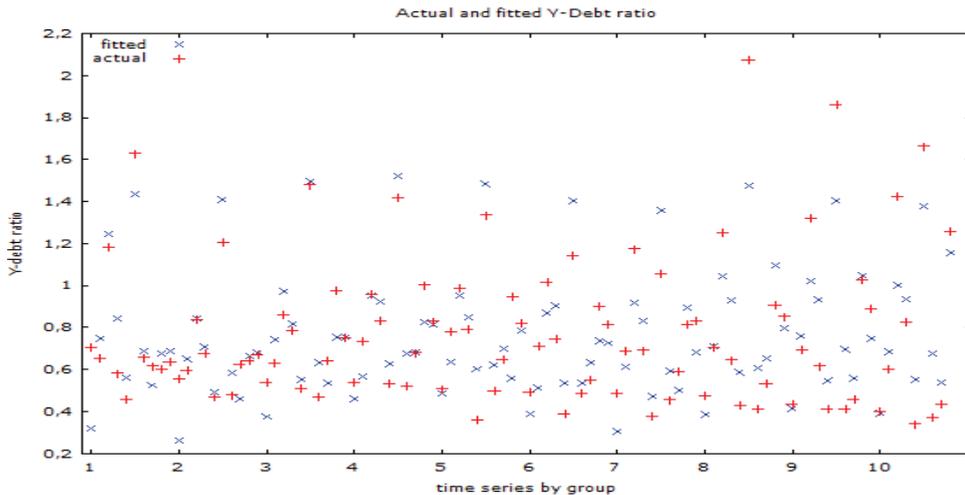
we have heteroskedasticity in our model. Under the classical assumptions, including homoscedasticity, ordinary least squares is the best linear unbiased estimator (it is unbiased and efficient). The efficiency is lost, however, in the presence of heteroscedastic disturbances. A low p-value counts against the null hypothesis that the pooled OLS model is adequate, in favor of the random effects alternative. Therefore, if the p-value associated to a heteroscedasticity test falls below a certain threshold (0.05), we would conclude that the data is significantly heteroscedastic, otherwise the data is homoscedastic and OLS is the best linear unbiased estimator of the regression. In case of performing this test, the p-value is 0.933 and as it is higher than 0.05, the null hypothesis should be accepted and the OLS estimation method should be chosen instead of REM.

H_0 : Data is homoscedastic => OLS is adequate

H_1 : Data is heteroscedastic => REM is adequate

LM = 0.006 with p-value = $\text{prob}(\text{chi-square} > 0.006) = 0.933 \Rightarrow \text{p-value} > 0.05 \Rightarrow \text{accept } H_0 \Rightarrow \text{Data is homoscedastic} \Rightarrow \text{OLS is adequate.}$

Figure 3. Experimental values of the debt ratio and the values adjusted by the model (d), using the OLS technique



Source: Author's processing in Gretl software.

The Hausman test can be used to differentiate between fixed effects model and random effects model in panel data. In this case, Random effects (RE) is preferred under the null hypothesis due to higher efficiency, while under the alternative Fixed effects (FE) is at least consistent and thus preferred. A low p-value counts against the null hypothesis that the random effects model is consistent, in favour of the

fixed effects alternative. Thus, if the p-value associated to this indicator is higher than 0.05 we would conclude that the null hypothesis is true and the random effects model estimation is the optimum. If the p-value is lower than 0.05, the fixed effects model is the best estimator.

H_0 : REM is adequate

H_1 : FEM is adequate

In the current situation there is no need for performing the Hausman test, as both previous tests already confirmed that the OLS method offers the best estimation (instead of FEM and REM) for the chosen multiple regression.

Using the OLS technique, the actual values of the debt ratio were plotted with red (+) and those estimated by the chosen model (d) were marked with blue (x) in Figure 3.

5. Conclusions

Based on the simple regressions obtained, our findings point out that the firm's capital structure is negatively influenced by tangibility and size. This represents a confirmation of previous studies which have considered that, for developing countries, the tangibility of a company's assets is negatively correlated with its debt ratio, given that a high level of tangible fixed assets does not represent a guarantee for creditors in case of default of the borrower company. Besides, related to the size of the company, this study confirms the studies that have proved that larger firms can raise equity capital more easily than smaller firms and that the debt ratio is lower for larger firms. On the other hand, the profitability, asset turnover, liquidity and age are explanatory variables positively related to the level of debt. The empirical results of this study support the trade-off theory, according to which a more profitable company with a high level of liquidity and turnover will have a higher level of debt.

The methodology adopted in this research shows that the explanatory variable with the strongest influence on the level of debt of the company is the tangibility, followed by the profitability, the asset turnover, the liquidity, the age and the size.

For multiple regressions, the explanatory variables have different influences upon the dependent variable. The profitability remains positively correlated to the debt ratio, while the size, tangibility, asset turnover and age proved to be negatively correlated to the debt ratio in this context.

This ten year panel study on the NYSE companies' (operating in the hotel industry) debt ratio proved that they are explained in a relatively high proportion by the analyzed independent variables. This study represents a benchmark for future empirical research related to the internal factors specific to the businesses operating in the hotel industry.

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TREND-ANTICIPATING VERSUS TREND-FOLLOWING

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Abstract: *This paper evaluates the impact of trading timing on trend-following performance for equity market indices across: (1) an ideal framework where investors successfully anticipate one-day-ahead signals and (2) a realistic framework with delayed transaction prices and cautious investors. We show that trend-following profits reduce significantly under the realistic trading timing. This bias is persistent, holds when controlling for trading costs, interests, and risk, being more pronounced for the emerging markets. Indirectly, the finding suggests that trend-anticipating tends to outperform trend-following as a trading strategy.*

Key words: *technical analysis; trading timing; moving averages*

JEL Classification: *G11; G12; G14*

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1. Introduction

Brock *et al.* (1992) showed that simple technical trading rules can create value for investors, triggering the development of an extensive literature. However, the empirical evidence is mixed with the mistrust being fueled twofold: a declining profitability over time and an illusory nature of technical profits. For instance, underestimating trading costs artificially inflates these profits (e.g., Bessembinder and Chan (1998); Bajgrowicz and Scaillet (2012), as is the data snooping through an excessive mining of popular data sets (e.g., Sullivan *et al.*, 1999; Marshall *et al.*, 2008; Shynkevich, 2017). Moreover, enough backtest overfitting can isolate the exact parameterizations that make almost any trading rule successful.

This paper shows that trading rules can appear profitable also because of unrealistic trading timing assumptions. We analyze the performance of a generic trend-following rule across two empirical settings: (1) an ideal framework denoted “I” in which investors successfully anticipate the rule’s one-day-ahead signals and the transaction price precedes the signal trigger price; and (2) a more realistic framework denoted “R*”, with a delayed transaction price in which investors seek confirmations from other rules. We find that the rule’s performance significantly reduces when evaluated under “R*”. There are frequent cases when the rule is successful under “I” but concomitantly unsuccessful under “R*”, while the reverse seldom happens. Moreover, under “R*”, the rule’s conditional buy and sell returns are no longer significantly different from the buy-and-hold returns as they are under “I”.

The realistic trading timing framework, denoted “R”, is usually synthesized through the “one-day delay” adjustment: the signal observed at close t is implemented at close $t+1$. Previous studies (e.g., Sullivan *et al.*, 1999; Ready, 2002; Shynkevich, 2017) show that this adjustment generally reduces the technical forecasting ability. This paper brings several contributions to the existing literature. First, when using closing prices only, we show that the occurrence of one-day exposures is not consistent with the way in which investors use technical trading rules. The reason is that under “R”, a one-day exposure: (a) generates a null before-cost return and (b) is always the result of a false signal. Investors mitigate the risk of following false signals by using various confirmation criteria before changing their equity exposure¹. Although rarely considered in empirical tests, these additional confirmations make the one-day exposure an unlikely scenario when trading on daily closing prices exclusively. Consequently, we adjust the “R”

¹ E.g., a new signal persists for a minimum number of days (time delay filter), is jointly confirmed by multiple rules, the price and/or volume change triggering a new signal has a minimal magnitude and so on.

framework by preventing the occurrence of one-day exposures, thus defining “R*”. Second, we evaluate trend-following performance across the two trading timing settings while controlling for the influence of trading costs, interests, and risk. Third, the evaluation covers 11,670 economically justifiable trend-following parameterizations that objectively span the calibrations used in practice.

This paper is not concerned whether trend-following outperforms passive investing. Nevertheless, it deals with various profitability measures that are exposed to data snooping. We mitigate this risk by evaluating the impact of realistic trading timing in two environments: (1) over an extensive time period using the Dow Jones Industrial Average (1954-2013) to allow for a persistence check and (2) across a representative sample of 13 Asia-Pacific stock market indices (1999-2013) as a robustness test. A regular choice in the literature, the DJIA offers a long price history, is representative for the liquid blue chip investments, and characterizes the most developed stock market.

2. Mechanics of a generic technical trading rule

We assume a generic rule that uses past daily closing prices to generate buy (B), sell (S), and neutral-hold (N) trading signals. Every day t the rule updates its trading signal S_t . Given a price series $\{P_t\}$, the rule generates a sequence of signals $\{S_t\}$ and a sequence of returns $\{R_t\}$. The rule’s returns depend on the investor’s specific equity exposure during buy, sell, and neutral days. With trading signals coded numerically (i.e., buy = ‘2’, sell = ‘0’, neutral = ‘1’), the rule’s return R_t is the product between the signal and the asset’s daily return (r_t). We assume that at close t investors are able to successfully anticipate the rule’s signal at close $t + 1$ (i.e., S_{t+1}). Moreover, if S_{t+1} recommends a change in their investment exposure, they also execute the implied trade at close t . Thus, close $t + 1$ is the transaction trigger and close t is the transaction price. In this ideal framework “I” with perfect trading timing the rule’s return is computed as $R_t = S_t \cdot r_t$.

As mentioned, studies synthesize a more realistic trading timing through the one-day delay adjustment: an exposure change triggered by S_{t-1} is implemented in day t at close t . Thus, under “R”, the rule’s return is computed as $R_t = S_{t-1} \cdot r_t$. Because of the delayed transaction price and the single daily price, the rule’s return in the first day of each newly implemented exposure is null.

Given a signal series $\{S_t\}$, the two frameworks yield different investment exposures as depicted in Figure 1a. Under “I”, delimiting $\{S_t\}$ into buy and sell exposures is straightforward and ensures a perfect match between the exposure’s type and the type of its signals. Under “R”, the current buy exposure terminates only after the occurrence of the first sell signal (S_3). As a result, the investor continues to hold the risky asset in day 3 when she should not and vice versa in day 6. This delayed trading timing is expected and has been proven to reduce the

rule’s performance. Under “R”, the partition of a signal series into a sequence of exposures $\{E_i\}_{i \geq 1}$ is based on two properties: (P1) the type of E_i is the type of the last signal in E_{i-1} and (P2) E_{i-1} and E_i are different type exposures.

Figure 1. Delimitating trading signals into investment exposures

Series of trading signals	“I” – Ideal timing	“R” – Realistic timing
(a) ... B ₁ B ₂ S ₃ S ₄ S ₅ B ₆ B ₇...	... B ₁ B ₂ } {S ₃ S ₄ S ₅ } {B ₆ B ₇ ... buy sell buy	... B ₁ B ₂ S ₃ } {S ₄ S ₅ B ₆ } {B ₇ ... buy sell buy
(b) ... S ₁ S ₂ B ₃ S ₄ S ₅...	... S ₁ S ₂ } {B ₃ } {S ₄ S ₅ ... sell buy sell	... S ₁ S ₂ B ₃ } {S ₄ } {S ₅ ... sell buy sell

The more sensitive a rule is, the better its potential performance in exploiting the price dynamics. The downside is a more volatile signal series and an increased probability of generating false signals and one-day exposures. In Figure 1b, the isolated buy signal B₃ generates a one-day buy exposure in both frameworks: {B₃} and {S₄} respectively. While under “I”, the rule’s return during the buy exposure, $\ln(P_3/P_2)$, might be large enough to cover the round-trip trading cost, under “R”, the rule’s before-cost return is null: $\ln(P_4/P_4)$. Therefore, investors cannot possibly profit from one-day exposures even when generated by correct signals, which is not the case. Even with high-frequency prices, the cost-efficiency of one-day exposures (intraday trading) remains a salient issue for the success of a trading rule.

Figure 2. The effect of banning one-day exposures

Series of trading signals	“R” ≡ {P1, P2}	“R*” ≡ {P1, P2, P3}
. B ₁ B ₂ S ₃ B ₄ S ₅ S ₆ B ₇ B ₈ .	. B ₁ B ₂ S ₃ } {B ₄ } {S ₅ } {S ₆ B ₇ } {B ₈ . buy sell buy sell buy	. B ₁ B ₂ S ₃ } {B ₄ S ₅ S ₆ B ₇ } {B ₈ . buy sell buy

Investors are aware of the risk associated with false signals and/or excessive trading and they rarely use a rule without seeking confirmations from other rules. With such external checks, one-day exposures become improbable even for very sensitive parameterizations, which could thus prove to be profitable after trading costs. We prevent the occurrence of one-day exposures by introducing a third property: (P3) the signal generated in the first day of an exposure is ignored. Since the restriction in P3 is external to the rule it is consistent with the before mentioned confirmation criteria that are external as well. The prevention could have also been achieved by desensitizing a rule through calibrations of its internal parameters but in doing so potentially profitable parameterizations are

unjustifiably eliminated. Also, since it is axiomatic, P3 ensures a valid ex ante elimination of one-day exposures as opposed to desensitizing the rule.

We define “R*” as the regular realistic trading timing framework “R” (based on P1 and P2) adjusted with the P3 restriction. The impact of P3 is visible in Figure 2 where the same sequence of four signals $\{B_4, S_5, S_6, B_7\}$ generates 3 exposures under “R” but only one under “R*”. Thus, the rule’s excess return is expected to be higher under “R*” due to a lower trading cost. As a result, comparing a rule’s return under “I” and “R*” (rather than “R”) makes any negative impact of realistic trading timing to be obtained in a conservative way.

3. Methodology and data

We synthesize trend-following using moving averages of past prices: a long-period average A_l as indicator of major trends and a short-period average A_s corresponding to short term movements, where $A_s = (P_{t-(s-1)} + \dots + P_t) / s$. The moving average rule generates its trading signals after comparing A_s and A_l . To prevent false signals, the rule triggers a signal change only when the crossings between A_s and A_l qualify as relevant. This internal confirmation is achieved by introducing a band f around A_l , called fixed filter. After market close in day t , the signal is “buy” if $A_s > (1 + f) A_l$, “sell” if $A_s < (1 - f) A_l$, and “neutral” if $|A_s - A_l| \leq f A_l$.

The rule’s parameterizations are generated around $\mathbf{p} = (s, l, f)$, with $1 \leq s < l$ and $f \geq 0$. Selecting only economically justifiable parameterizations yields $P = \{(s, l, f): s = 1 \text{ to } 10, s < l = 2 \text{ to } 200, f = 0 \text{ to } 5\%$, a universe set with 11,670 parameterizations, in line with real-world ranges for the rule’s calibrations. Moreover, P synthesizes a collective investor, consistent with the subjective alterations of the rule’s parameters that are frequent in practice.

We evaluate the rule’s performance against the buy-and-hold (BH) return, in terms of conditional returns and overall profitability. If the mean buy (sell) return is positive (negative) and significantly different from the mean unconditional BH return, then the rule correctly positions the investor. We measure the rule’s profitability using the annualized excess return over the BH return, before-costs (ER^*) and with a one-way trading cost of $c = 0.5\%$ (ER). Since trading costs are salient when evaluating active trading, we compute the rule’s break-even trading cost ($BETC$) to avoid a subjective choice for c . All performance measures are reported as average values across the universe set P . The rule is implemented according to the popular double-or-out strategy. The daily rates of the 3-month Libor and U.S. T-bills constitute the borrowing and depositing rate respectively. The rule’s excess return ER is computed as follows.

$$ER = (GR + C + NI) - R_{BH} = (GR - R_{BH}) + C + NI = ER^* + C + NI$$

where GR is the rule’s gross return, $C \leq 0$ is the total trading cost computed as a logarithmic return (assuming $c = 0.5\%$), NI is the net interest resulted from

borrowing and depositing capital, R_{BH} is the risky asset's BH return, and ER^* is the rule's before-costs excess return.

We use U.S. dollars denominated closing prices for the 15 investigated stock market indices. The data is from Datastream and the Dow Jones Averages website. The indices are abbreviated as follows: Australia (AU, S&P ASX 200), China (CN, Shanghai SE A Share), Hong Kong (HK, Hang Seng), Indonesia (ID, Jakarta Composite), India (IN, S&P BSE 100 National), Japan (JP, Nikkei 225), South Korea (KR, Korea SE Composite), Malaysia (MY, Kuala Lumpur Composite), New Zealand (NZ, S&P NZX 50), Philippine (PH, Euromoney HSBC), Singapore (SG, Straits Times Index), Thailand (TH, Bangkok S.E.T.), Taiwan (TW, Taiwan SE Weighted), United States (US1, DJIA; US2, S&P500).

4. Results

Table 1 characterizes the rule's profitability for DJIA across the two trading timing frameworks "I" and "R*". The results describing the economic and statistical significance of the rule's conditional returns (Panels A and B) and its overall performance (Panel C) converge to the same conclusion. The rule's performance is substantially lower when considering the realistic trading timing assumption "R*". This bias is persistent, holding for all four DJIA subsamples.

Panel A shows that between 1954 and 1999 the "R*" mean buy return ("Buy-mean") represents between 35% and 52% of the "I" counterpart, with only 0.8% during 1999-2013. The "I" mean sell return ("Sell-mean") is negative in all four subsamples supporting the rule's forecasting ability. Under "R*", all mean sell returns are positive with an extreme situation during 1984-2013 when the sell return is actually much larger than the buy return. During 1999-2013 for instance, whenever the investor received a buy recommendation and doubled her equity exposure, the index advanced with an average of 0.18% per year. When liquidating and depositing the capital at the cash rate according to the sell recommendation, the index advanced with an average of 11.67% per year! The results underline how fragile is the rule's ability to generate correct signals even with minor methodological changes. On the other hand, trading timing does not significantly influence the volatility of buy and sell returns (see "Buy-std" and "Sell-std").

For each parameterization, we test the statistical significance of the "buy", "sell", and "buy-sell" returns using the *t*-statistics described in (Brock *et al.*, 1992). For "buy" ("sell"), the null hypothesis is: the mean buy (sell) return equals the mean unconditional BH return. For "buy-sell", the null is: the mean buy return equals the mean sell return. The results in Panel B show the percentage of parameterizations rejecting the null at a 5% level. Under "I", adequate sell recommendations are more frequent than buy recommendations (except for 1969-1984). This suggests that trend-following works better during bearish markets, see (Han *et al.*, 2013). Because "buy-sell" is a more extreme return, the rule's

performance appears improved through this variable: 35% (1999-2013) to 75% (1954-1969) of all parameterizations are successful in rejecting the null. However, the rule’s success rate almost vanishes under “R*”, for all three types of returns and in all subsamples. Again, the most recent sample is the rule’s worst period.

Table 1. The trading timing bias (DJIA)

	1954-1969		1969-1984		1984-1999		1999-2013	
	I	R*	I	R*	I	R*	I	R*
Panel A: Conditional “buy” and “sell” returns (%)								
Buy-mean	21.16	10.85	24.82	8.75	27.14	11.20	22.86	0.18
Buy-std.	8.93	9.19	14.31	14.31	13.21	13.63	14.07	14.34
Sell-mean	-17.20	6.75	-18.22	4.20	-22.56	22.68	-25.75	11.67
Sell-std.	15.84	15.57	17.75	18.07	35.84	31.93	33.00	33.01
Panel B: Statistical significance of “buy”, “sell”, and “buy-sell” returns (%)								
Buy	29.73	0.81	42.35	0.93	16.19	0.03	16.60	0.04
Sell	54.39	6.00	29.67	0.24	30.44	0.75	27.91	0.05
Buy-sell	75.41	23.38	57.17	2.33	37.83	0.36	35.52	0.01
Panel C: Overall performance (%)								
<i>ER*</i>	5.46	4.14	3.14	0.85	4.51	2.65	0.75	-0.03
<i>ER</i>	0.39	-0.51	-2.71	-4.46	-2.30	-3.52	-5.80	-5.72
Rule std.	13.34	13.47	17.82	17.76	20.36	21.00	19.31	19.44
<i>SR</i>	0.01	-0.05	-0.15	-0.24	-0.11	-0.17	-0.28	-0.28
<i>BETC</i>	0.59	0.49	0.30	0.14	0.38	0.16	0.06	-0.01

Notes: Panel A reports the annualized mean and standard deviation of buy and sell returns. Panel B reports the percentage of parameterizations generating conditional returns that are statistically significant at a 5% level. Panel C describes the rule’s overall performance in annualized values: the before and after-costs excess return (*ER** and *ER*), the standard deviation in the rule’s returns (“Rule std.”), the Sharpe ratio (*SR*) based on *ER*, and the break-even trading cost (*BETC*). All values reported in Panels A and C are averages across the 11,670 parameterizations in *P*. The null hypothesis of equal means across “I” and “R*” (Panels A and C) is rejected at a 0.1% level (except “Sell-std.” for 1999-2013).

In Panel C, we evaluate the rule’s overall performance by reporting its mean excess return (*ER*), Sharpe ratio (*SR*), and break-even trading cost (*BETC*). With null trading costs and interests, the rule is able to generate a positive excess,

although decreasing in time (see ER^*). Here as well, “I” outperforms “R*”. With $c = 0.5\%$, the positive excess return disappears in both frameworks starting with 1969. During 1999-2013, the BH strategy outperforms the rule with an average of 5.7% per year. Since the rule’s returns became more volatile from 1954 through 2013 (see “Rule std.”), its performance further deteriorates when risk-adjusted, as reflected by the decreasing Sharpe ratios. Finally, a mean $BETC$ constantly below 0.5% indicates that on average the rule fails to remain profitable after trading costs.

Table 2 presents the impact of realistic trading timing for 13 Asia-Pacific stock market indices, the DJIA, and the S&P500 (as a robustness check) during 1999-2013. For all indices and all performance measures, the results confirm the trading timing bias inferred from the DJIA. For most of the indices however, the rule’s mean excess return remains substantial even after costs: ER is negative only for Australia, Hong Kong, Japan, and the two U.S. indices. Eleven indices generate an “R*” $BETC$ larger than 0.5%, while for eight the “R*” $BETC$ is in excess of 1%.

The mean Sharpe ratios are relatively modest even for Indonesia, Philippine, and India. The impact of realistic trading timing is particularly visible when checking the highest Sharpe ratio across P . Several indices record severe drops in this value: Indonesia, from 1.05 to 0.69; India, from 1.15 to 0.57; Thailand, from 1.03 to 0.51. However, for Japan and the U.S. indices, the differences in the Sharpe ratios across “I” and “R*” are small. Two remarks are in place: (1) these three indices are among the five that failed to generate a positive excess return (ER) and (2) Japan and U.S. have the largest, most developed and most efficient financial markets. Hence, when the rule is already unsuccessful under ideal empirical conditions, the trading timing bias appears less substantial.

Column “R*/I” reports the percentage decrease in the rule’s before-costs excess return (ER^*) and total trading cost (C) when shifting from “I” to “R*”. While C records a decrease between 10% and 15%, the drop in ER^* is more substantial: from 17% (India) to 31% (Hong Kong) and 40% (Australia). An extreme drop of 104% in ER^* is recorded for US1 (DJIA). The net interest NI is a fairly small negative amount (varies from -0.16% for Japan and -0.53% for India) and remains virtually identical across the two frameworks. The results show that the beneficial impact of preventing one-day exposures ($P3$) is more than offset by the detrimental impact of realistic trading timing ($P1$). In this way, the validity of the negative bias implied by realistic trading timing is further reinforced.

Apart from analyzing mean values across the universe set P it is important to evaluate the impact of trading timing on each of the 11,670 parameterizations (column “Individual”). For this, we determine the percentage of parameterizations satisfying three properties relative to their excess return ER : (1) “R*” ER is less than “I” ER ; (2) “I” ER is positive but “R*” ER is negative; and (3) “I” ER is negative but “R*” ER is positive.

Table 2. The trading timing bias (Asia-Pacific stock market indices)

	ER (%)		BETC (%)		SR (%)		R*/I (%)		Individual (%)			“Buy” (%)		“Sell” (%)		“Buy-sell” (%)	
	I	R*	I	R*	I	R*	ER*	C	(1)	(2)	(3)	I	R*	I	R*	I	R*
AU	-0.46	-2.20	0.50	0.33	-0.02	-0.09	-40	-13	85	31	2	23	0	35	0	55	0
CN	9.98	8.16	1.68	1.60	0.30	0.25	-16	-12	85	6	1	80	31	68	10	99	87
HK	1.34	-0.38	0.69	0.55	0.04	-0.02	-31	-11	83	19	2	28	0	35	0	70	0
ID	17.26	14.07	2.52	2.43	0.43	0.34	-17	-12	81	2	0	55	20	85	31	99	83
IN	14.08	10.31	2.10	1.89	0.38	0.27	-22	-12	91	3	0	52	7	75	16	99	83
JP	-1.97	-1.96	0.49	0.46	-0.07	-0.07	-21	-15	54	3	4	24	0	30	0	60	0
KR	4.76	2.39	1.17	1.04	0.12	0.05	-28	-13	79	16	1	25	0	33	0	65	0
MY	6.20	4.26	1.31	1.17	0.25	0.17	-21	-10	88	8	0	53	15	79	17	98	74
NZ	3.43	2.28	1.01	0.91	0.13	0.08	-20	-12	83	9	1	29	0	50	2	84	17
PH	11.70	8.76	2.24	2.14	0.30	0.22	-21	-13	87	7	0	35	0	91	25	98	67
SG	5.43	3.91	1.22	1.10	0.21	0.15	-20	-12	86	11	0	47	0	67	5	98	58
TH	9.42	6.80	1.43	1.27	0.28	0.20	-21	-12	89	3	0	46	7	70	23	92	51
TW	5.98	3.65	1.09	0.94	0.20	0.12	-25	-12	87	7	0	44	8	65	12	91	45
US1	-5.80	-5.72	0.06	-0.01	-0.28	-0.28	-104	-14	55	2	0	17	0	28	0	36	0
US2	-4.48	-4.19	0.20	0.18	-0.22	-0.20	-28	-14	45	4	4	16	0	29	0	41	0

Notes: “R*/I” reports the percentage change in the rule’s before-costs excess return (ER*) and total trading cost (C) when shifting from “I” to “R*”; “Individual” reports the percentage of parameterizations satisfying: (1) “R*” ER is less than “I” ER; (2) “I” ER is positive and “R*” ER is negative, and (3) “I” ER is negative and “R*” ER is positive. The null hypothesis of equal means across “I” and “R*” for ER, BETC, and SR is rejected at a 0.1% level, except for Japan’s ER and SR.

The results show that with the exception of Japan and the U.S. indices, at least 80% of all parameterizations confirm the detrimental effect of realistic trading timing. The more extreme situation where the rule is successful under “I” but concomitantly unsuccessful under “R*” accounts for a percentage between 2% (US1) and 31% (Australia), with an average of 8.73%. Finally, the reverse situation (3) seldom happens except for Japan and US2 (S&P500). The findings indicate that a trading rule or parameterization can artificially appear profitable due to unrealistic (ideal) trading timing assumptions.

The last six columns in Table 2 (i.e. “Buy”, “Sell”, “Buy-sell”) describe the rule’s ability to correctly position the investor. The fractions of parameterizations generating significant conditional returns reveal the most severe impact of realistic trading timing. Whenever the rule’s success ratio under “I” is less than 50%, it completely disappears under “R*”. Somehow expectedly, the indices in this category are those of the developed markets: Australia, Hong Kong, Japan, South

Korea, and U.S. However, the drop in the percentage of significant buy and sell returns is also severe for the emerging markets of China, Indonesia, Philippine, India, Malaysia, and Thailand. For “buy-sell” returns, the impact on these indices is generally less severe because the null hypothesis is easier to reject.

5. Conclusions

This paper shows that realistic trading timing imposes a significant and robust penalty on trend-following profits. The results underline the fragility of a rule’s ability to generate correct investment recommendations even with minor changes in the empirical testing framework. This finding raises the question whether a methodological bias, in general, can contribute to illusory technical profits. More importantly, the paper shows that trend-following might not be profitable if the investors simply follow a rule’s trading signals without risking anticipating them.

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